

Project on Hospital Management System for the Mayo Clinic in CBAP

Q1) Identifying stakeholders – Create a list of stakeholders (as taught in Business Analysis Planning and Monitoring Knowledge Area)

Ans) The list of the stakeholders are as follows:

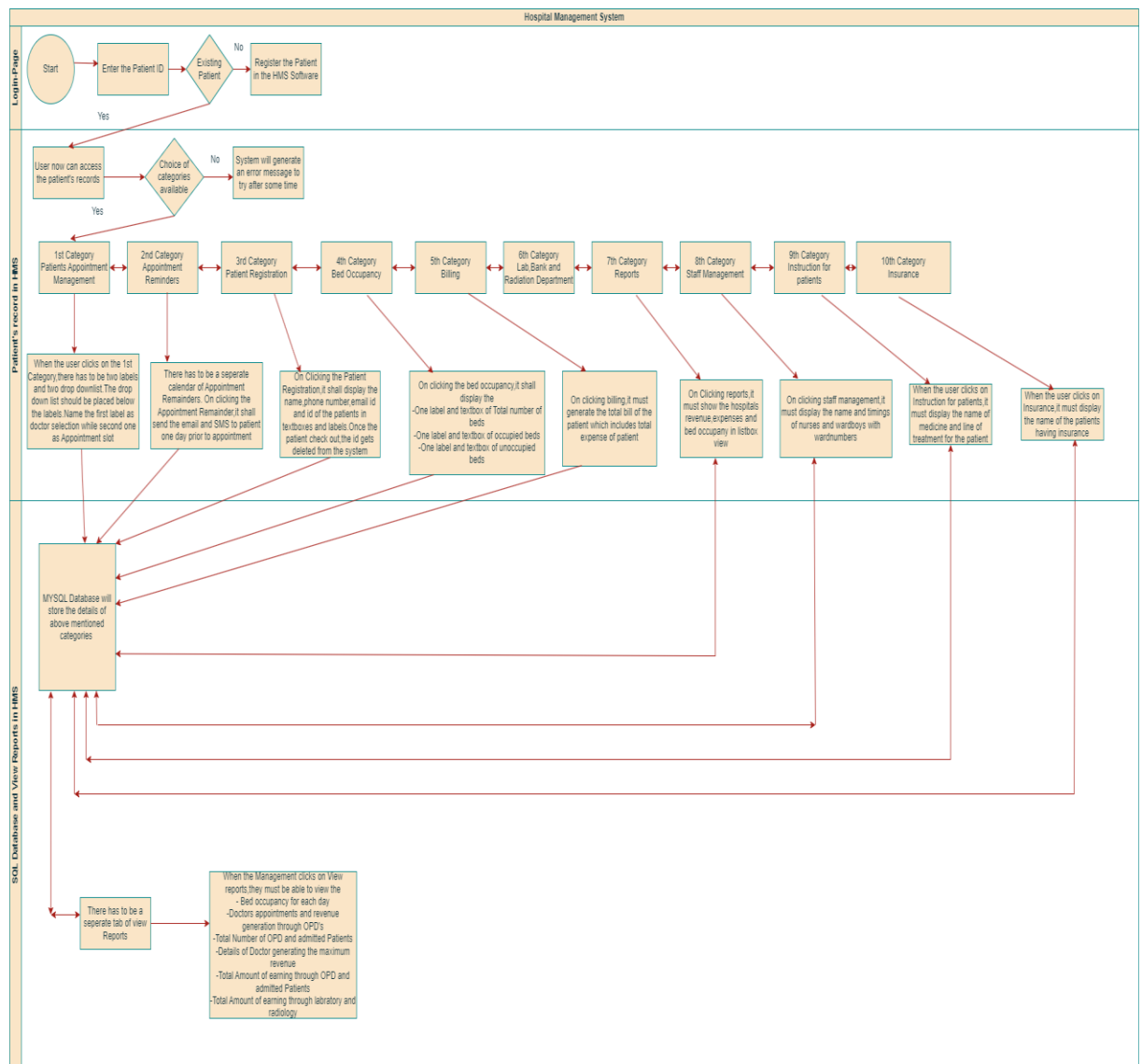
- a) Doctors of the Mayo Clinic: responsible for the treatment and operations of the patients in Mayo
- b) Staff of the Mayo Clinic: are the nurses, technicians and the other employees employed in Rochester, Minnesota; Jacksonville, Florida; and Scottsdale and Arizona
- c) Patients of the Mayo Clinic: are also one of the important stakeholder as they come for their treatment in the hospital
- d) Management of the Mayo Clinic: are the key stakeholders as they would like to view the reports of the bed occupancy, doctor's appointment and total amount of earnings generated from an individual laboratory and radiology

Q2) Describe the proposed system's workflow

Ans) The proposed system is the automated Hospital Management System(HMS) required by the Management of the hospital. The workflow of the proposed system is mentioned below:

- a) The HMS must manage the operations of the hospital(Mayo Clinic)
- b) There has to be a database in HMS for storing the patient's record. This database must give the information about the personal details of the patient's such as Name, Address, email id and Date-of birth
- c) There has to be a drop down list or listbox which shows the availability of beds, management of patient's billing and scheduling of doctor's appointment
- d) The patients appointment management, appointment reminders, patient registration, bed occupancy, billing, laboratory, blood banks and radiation departments, reports, staff management, Instruction for patients, Insurance and reports view and generation section must be included inside the HMS.

The future process map of Hospital Management System is mention below:



Q3) Write in-scope and out-scope items for this software

Ans) In-scope requirements of the software which lie inside the boundary while out-scope requirements lie outside the boundary.

Some of the in-scope requirements of the software are listed below:

In-scope requirements

- There has to be a login system in the software for accepting the new and existing patients credentials
- Various categories such as Patients Appointment Management, Appointment Reminders, Patient Registration, Bed Occupancy, Billing, Lab, Blood Bank and radiation departments, reports, staff management, Instruction for patients, Insurance and reports section has to be available inside the software
- The Operating System use for this software shall be Windows 2016
- The automated Hospital Management System must support the capacity of handling 500 people at a time

- e) The user-interface of Hospital Management system has to be user-friendly
- f) There has to be database of MySQL for supporting the various categories such as Patients Appointment Management, Appointment Reminders etc

Some of the out-of-scope requirements are listed below:

Out-of scope requirements

- a) If the automated Hospital Management Software(HMS) is accessible by alternate clinic apart from Mayo clinic, then it comes under Out-of scope requirement
- b) If the automated HMS is app based then it is also categorized as out-of scope requirement. The automated HMS has to be web-based only
- c) When the user clicks on the insurance category, it must show the names of the insured patients. If the names of the uninsured patients are also visible in the HMS, then it is counted under Out-of-scope requirement
- d) The view reports tab inside the HMS must be accessible for Management of Mayo-Clinic only. If the view reports tab is accessible to staff, employees and patients then it comes under Out-of scope requirement

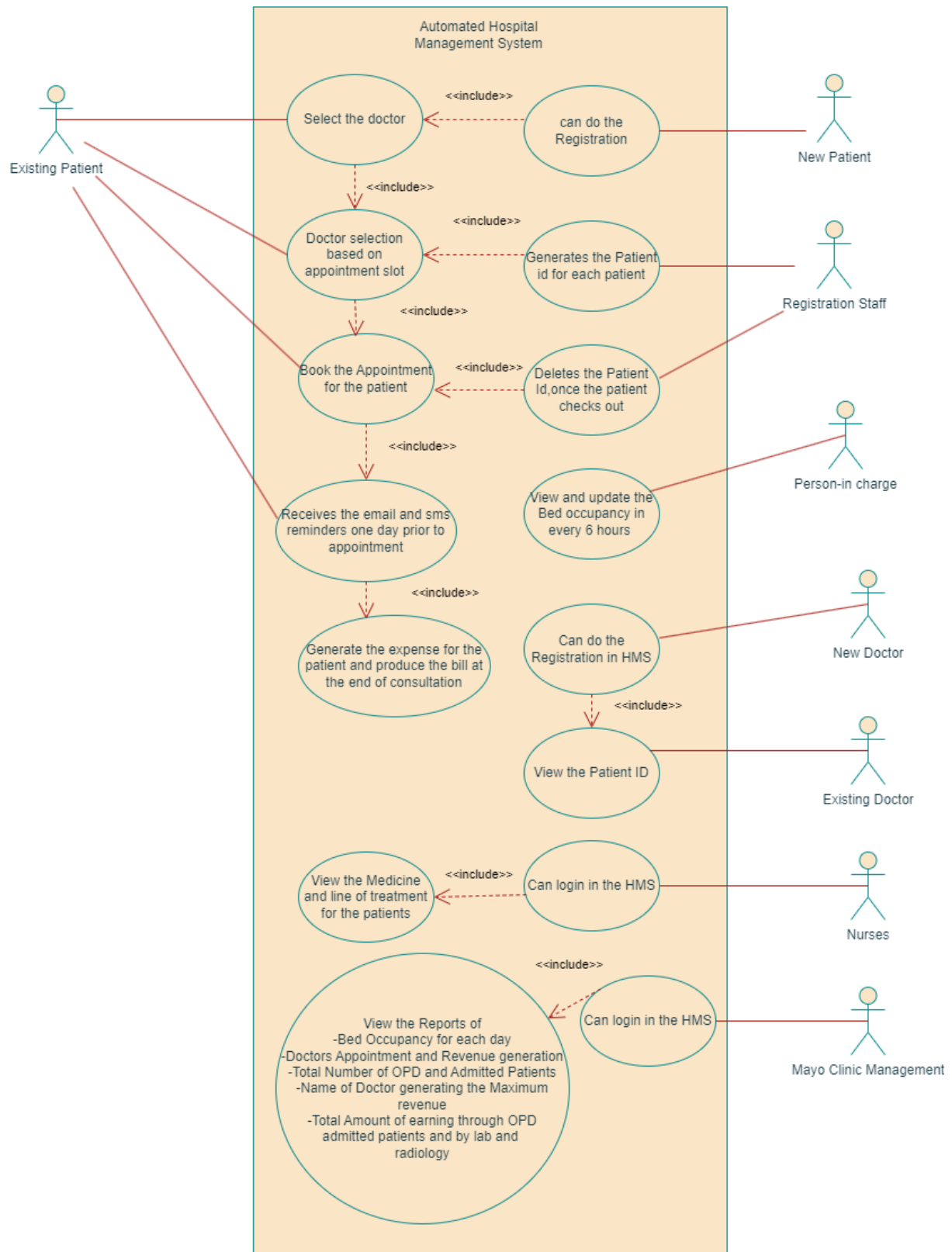
Q4) As a Business Analyst working on this project, find out the scope of the hospital management system. To find the scope you can use Use Case diagram (UML) or Context diagram

Ans) Scope of the Hospital Management system is one of the acceptance criteria. Scope can be in-scope or out-of scope. Examples of in-scope of hospital Management system is as follows:

- a) The Hospital Management System software has to be web based
- b) The HMS shall be available for Windows 2016
- c) The HMS software has to be available for Mayo Clinic locations in Rochester, Minnesota; Jacksonville, Florida; and Scottsdale and in Arizona
- d) The automated Hospital Management System must support the capacity of handling 500 people at a time

The Use case Diagram of Hospital Management System is mentioned below:

Use case Diagram of Hospital Management System



Q5) Write down the main features that need to be developed

Ans) The main features that need to be developed are as follows:

- a) The automated HMS must have a login window for entering the username and patient id for the existing and new patients. There has to be one label of username attached with textbox and other label of patient id attached with textbox. The username textfield must accept the all patient's name.
- b) The Hospital Management system must have one submit and reset button for capturing and erasing the details of users from the given textfields
- c) Once the user clicks on the submit button, they must be able to view the home and categories top on the top bar of the home page
- d) When the user clicks on categories, the different categories must appear in the drop down format. In categories, the lists are segmented in following format ie
 - 1-Patients Appointment Management
 - 2-Appointment Reminders
 - 3-Patient Registration
 - 4-Bed Occupancy
 - 5-Billing
 - 6-Lab, Blood Bank and Radiation Departments
 - 7-Reports
 - 8-Staff Management
 - 9-Instruction for Patients
 - 10-Insurance
 - 11-Reports for Management
- e) The patients Appointment Management has to be bold and underline. When the user clicks on patients Appointment Management, it must open a browser in a new window. In new window, there has to be label of doctor selection and the name of the doctors should be listed inside the listbox. The second label should be of Appointment slot attached with the calendar with date and time. There has to be a separate button of Book appointment and Cancel the Appointment which must be functional
- f) When the user clicks on Book Appointment, they must get notified about their appointment date on their email id and through text messages. If the user clicks on cancel appointment, they must be landup in the home page or which displays all the categories
- g) The Appointment Reminders has to be bold and underline. When the patient clicks on Appointment Reminders, it shall email and SMS to patient one day prior to appointment.
- h) The patient registration has to be bold and underline. This link should be accessible to Registration staff of Mayo Clinic only. When the staff clicks on the link, it shall open a drop down in a list view. In that last, there has to be a label of Show patient history on the top. There has to be label of Name of the patient along with the combo-box where the name of the patients are stored inside. User must be able to select one name inside the combo-box. There has to be a button of show patient details and one textarea located below the button. When the user clicks on show patient details, it must display the patient's history in the textarea

- i) The **Bed Occupancy** has to be bold and underlined. Once, the user clicks on **Bed Occupancy** it shall open the window in a new browser. In a new window, there has to be a label of **Bed Occupancy**. This **Bed Occupancy** link shall be accessible for person in charge of Mayo Clinic only. Along with a label of **Bed Occupancy**, there has to be a button of **Bed Count** and one textarea. Once, the user clicks on the **Bed count**, it must display the total number of occupied and unoccupied beds in the textarea. There has to be a label, a drop down and a button of **Bed Updation**. The name of the label can be **Updating the Bed count**, in drop down there has to be a time series i.e. 8:00 am, 9:00 am till 11:00 pm. Once, the person in charge clicks on **Bed Updation** after six hours, the count of occupied and unoccupied beds must get updated in the above textarea.
- j) The **Billing** has to be bold and underlined. This link must be accessible for patients, doctors and Mayo Clinic management. Once the patient clicks on the **Billing**, it must display the name, age, gender, date of admission, date of discharge and total expense in the textarea view.
- k) The **Lab, Blood Bank and radiation department** has to be bold and underlined. It shall be accessible to doctors of Mayo Clinic only. When the doctor clicks on the link, it must open a textarea in the existing window. Inside the textarea, there has to be a textfield where doctor can enter the patient id and a button of **view details**. Once the doctor enters the patient id in the textfield and clicks on **view details**, a detailed record of patient must appear in another textarea.
- l) The **reports** has to be bold and underlined. This reports should be accessible to Senior Management of Mayo Clinic only. Once, the senior Management clicks on report it must open a window in separate browser. Inside the window, there has to be a label of **Reports** on the top side. There has to be a textarea which displays the hospital's revenue, expenses, bed occupancy details to the senior Management.
- m) The **staff management** has to be bold and underlined. When the user clicks on staff management, it must display a textarea in the same window. Inside the textarea, there has to be two labels attached with two combo-boxes. The first label is **List of Nurses** while the second one is **List of Ward Boys**. The first combo-box stores the names of nurses while the second one stores the name of ward boys with ward numbers.
- n) The **Instruction of patients** has to be bold and underlined. When the user clicks on this section, it must display a textarea which contains the Name, age, address of the patient along with the line of treatment.
- o) The **Insurance tab** has to be bold and underlined. When the user clicks, on insurance tab it must display the list of insured patient in the textarea.
- p) The **Reports for Management** has to be bold and underlined and it must be accessible to Management of Mayo Clinic only. When the Management clicks on **Reports for Management**, it shall display a window in a new browser. This window must contain a textarea which shall display:

-A label of **Bed occupancy** for each day with attached textfield

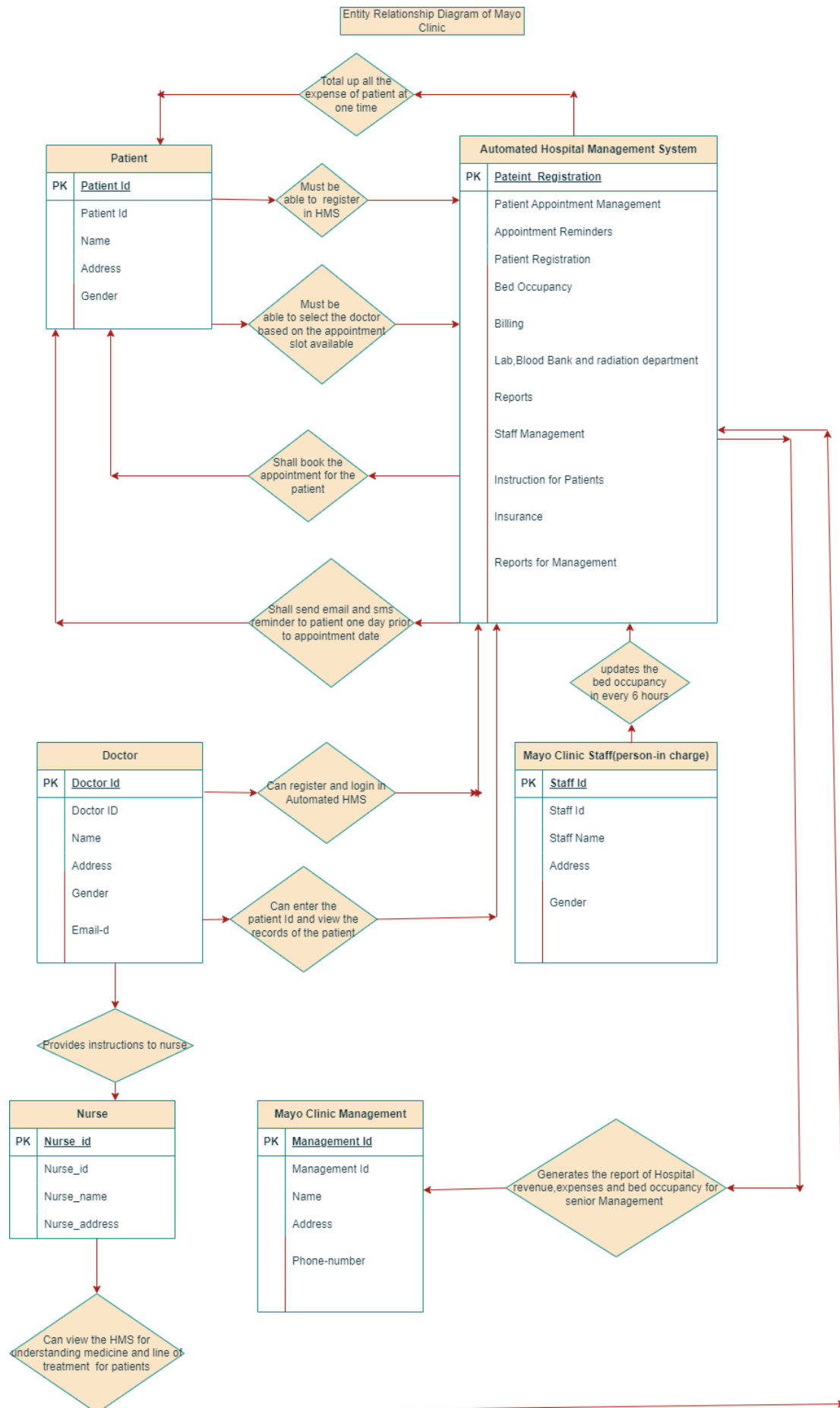
-A label of **Doctors' appointments and revenue generated through OPDs** with attached textarea

- One label of **Total number of OPD patients and admitted patients** with attached textfield

- A label of Doctor's Name generating maximum revenue attached with textfield
- A label of Total amount of earnings generated through laboratory and radiology with attached textfield

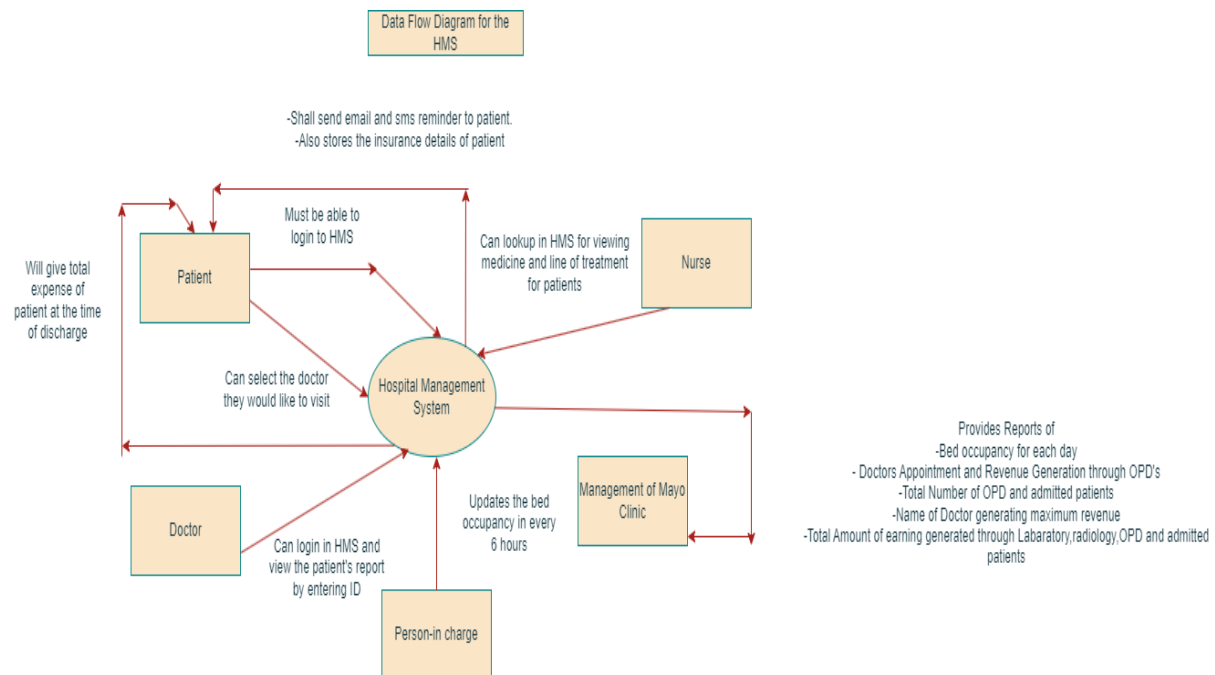
Q6) Draw an ER diagram of the system

Ans) The ER diagram of the system is mention below:



Q7) Draw a data flow diagram for the HMS

Ans) The data flow diagram for the HMS is mention below:



Q8) Write the functional and non-functional requirements for this software

Ans) **Functional requirements:** are the requirements which must be present in the product. These Are the functional requirements that developer must enable to accomplish the task Some of the Functional requirements of Automated Hospital Management System are as follows:

- The automated Hospital Management system must have a login screen of two labels and textfields where the first label is username and the second label is of patient id. There has to be textfields attached with username and patient id
- In the login screen,there must be one submit and reset button.When the user clicks on reset button,it shall erase the details from the textfields but when the user clicks on submit button,it will accept the username and id of the patient. In username,patient can enter their name
- Once,the user clicks on the submit button,the home page must appear in front of the user where there should be two tabs ie home and categories.Both these tabs must be underline and functional
- When the user clicks on Home tab,it must refresh the home page or first window but when the user clicks on categories tab,it must display the name of categories in a list wise view ie in a drop down to the user.In a drop down menu,there has to be different categories which must be listed sequence wise in numeric format.The list of categories are mention below:
 - 1-Patient's Appointment Management
 - 2-Appointment Reminders
 - 3-Patient Registration

- 4- Bed occupancy
- 5-Billing
- 6-Lab,Bank and Radiation Department
- 7- Reports
- 8-Staff Management
- 9-Instruction for patients
- 10- Insurance

- e) There has to be a database of MySQL which stores all the categories listed above
- f) There should be a view reports section which must be visible to Management of Mayo clinic so that they can view the reports of

-Bed occupancy for each day
- Doctors Appointment and Revenue Generation through OPD's
-Total Number of OPD and admitted patients
-Name of Doctor generating maximum revenue
-Total Amount of earning generated through Labaratory,radiology,OPD and admitted patients

Non-functional requirements: are the support features. These are the quality attributes

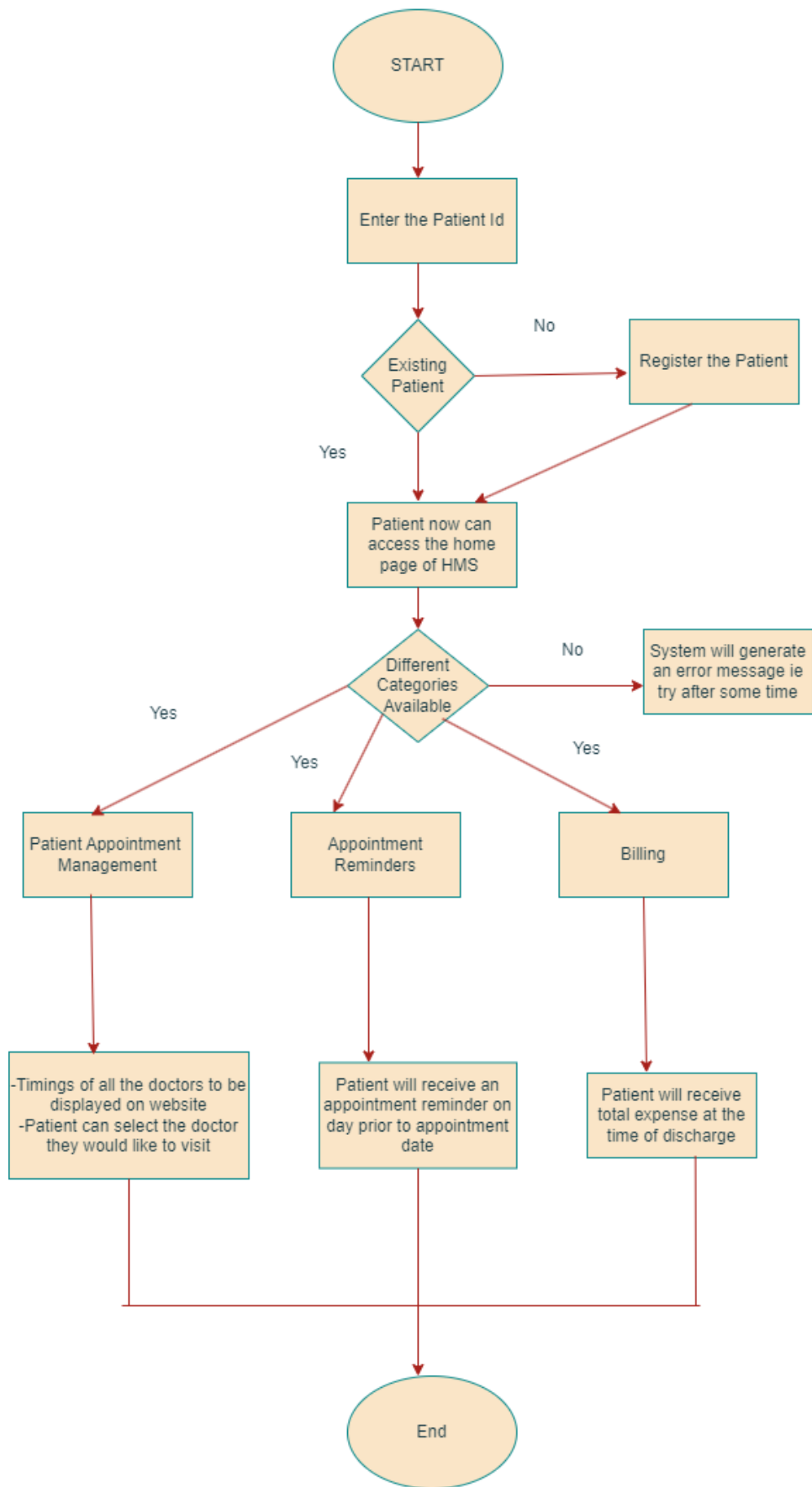
Some of the Non-functional requirements of Hospital Management System are as follows:

- a) **Availability:** The Hospital Management System must be available 24X7
- b) **Usability:** The Hospital Management System is easy to use for both new and registered patients,doctors,nurses and staff of Mayo Clinic
- c) **Portability:** The Hospital Management System must be easy accessible on Windows 2016
- d) **Security:** The HMS must handle access threats,viruses and malicious attacks
- e) **Extensibility:** The Hospital Management System can handle new features according to stakeholders requirements
- f) **Scalability:** The HMS must handle 500 people at a time

Q9) Draw a flowchart for the patients' admission process (using flowcharts). You can use any of the popular tools in the market like Microsoft Visio, Lucid Chart, Creately, Pidoco, or Balsamiq

Ans) The flowchart for the patient's admission process is mention below:

Flowchart of Hospital Management System



Q10) Draw wireframes or mock screens for any 2 of the features namely home page and patient registration screen. Students can draw wireframes for any other feature as deemed fit by them. (Use the technique prototyping or wire framing that is taught in the training). You can use any of the wireframing tools like Microsoft PowerPoint, Microsoft Word, Balsamiq, Sketch, Adobe XD, Adobe Illustrator, Figma, UXPin, InVision Studio, InVision Freehand, or Moqups

Ans) The wireframe of Home page which has various categories are as follows:

The wireframe shows a web browser window titled "Mayo Clinic Hospital Management" with the URL "https://www.mayoclinicusa.com". The page layout includes:

- Header:** Mayo Clinic logo on the left.
- Login Section:** Fields for "Username" and "Patient's Id" with "Submit" and "Reset" buttons.
- Make an Appointment Section:** Fields for "Your Name" and "Your location" (a dropdown menu showing Mayo Clinic Locations: 1) Rochester, 2) Minnesota, 3) Jacksonville, 4) Florida, 5) Scottsdale, 6) Arizona). A "View Contact Details" button is present.
- Home Section (Orange background):** A "Categories" dropdown menu with a list of 10 items: 1) Patients Appointment Management, 2) Appointment Reminders, 3) Patient Registration, 4) Bed Occupancy, 5) Lab/Blood Bank and Radiation Departments, 6) Reports, 7) Staff Management, 8) Instruction for patients, 9) Insurance, 10) Reports for Management. A "Sign-Out" button is located at the bottom left of this section.

The wireframe of patient registration which is inside the categories selection is mention below:

When the user clicks on patient registration,a new window gets open

Mayo Clinic Hospital Management

Home

3) Patient Registration

1) Patients Appointment Management

2) Appointment Reminders

3) Patient Registration

4) Bed Occupancy

5) Lab,Blood Bank and Radiation Departments

6) Reports

7) Staff Management

8) Instruction for patients

9) Insurance

10) Reports for Management

Mayo Clinic Hospital Management

Name of Patient

Age of Patient

Gender of Patient

Symptoms of Disease

Contact Number of Patient

Emergency Contact Number


Address of Patient

Email Address

Date of Appointment

MAY 2023						
S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10

Time of Appointment



CANCEL OK

Submit

Cancel

