Project

On

Hospital Management System

Prepaired By :

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HOSPITAL

A hospital is a health care institution providing patient treatment with specialized staff and equipment. Hospitals are usually funded by public sector by health organisations (for profit or non-profit), by health insurance companies, or by charities, including direct charitable donations. Hospitals have a range of departments (e.g., surgery, and urgent care etc).

HOSPITAL MANAGEMENT SYSTEM

A hospital management system is an information system that manages the aspects of a hospital. This may include the administrative, financial, and medical processing. It is an integrated end-to-end Hospital Management System that provides relevant information across the hospital to support effective decision making for patient care, hospital administration and critical financial accounting, in a seamless flow. This program can look after Inpatients, OPD patients, records, database treatments, status illness, billings etc. it also maintains their hospital info such as ward id, Doctor in Charge, Department administering etc. Now with a laboratory module to handle all lab operations...!!! Not only has this it also looked after doctor and staff records and payments. Now with advanced features like LAN connectivity, ICD10 disease database, Webcam support.

NEED OF HMS

1. Minimized documentation and no duplication of records.
2. Reduced paper work.
3. Improved Patient Care
4. Better Administration Control
5. Faster information flow between various departments

6. Smart Revenue Management
7. Effective billing of various services
8. Exact stock information

Product Function

The data represented in hospital management application will perform the following major function:-

- Patient Details: - It includes inpatient and outpatient details.
- Tasks:- It includes the various tasks which are used in hospital
- Billing Details:-This software will help to calculate the bill much quicker and simpler way. This enables the organization to keep the information in efficient and systematic way.
- Doctor Details : - It includes detail of doctor and detail of doctor attending a patient.
- Deleting and Updating Details : - It delete the patient Details which are discharged from hospital or Doctor who left the job.
  It updates the condition of patient, their age , Doctor details etc. Which changes due time.

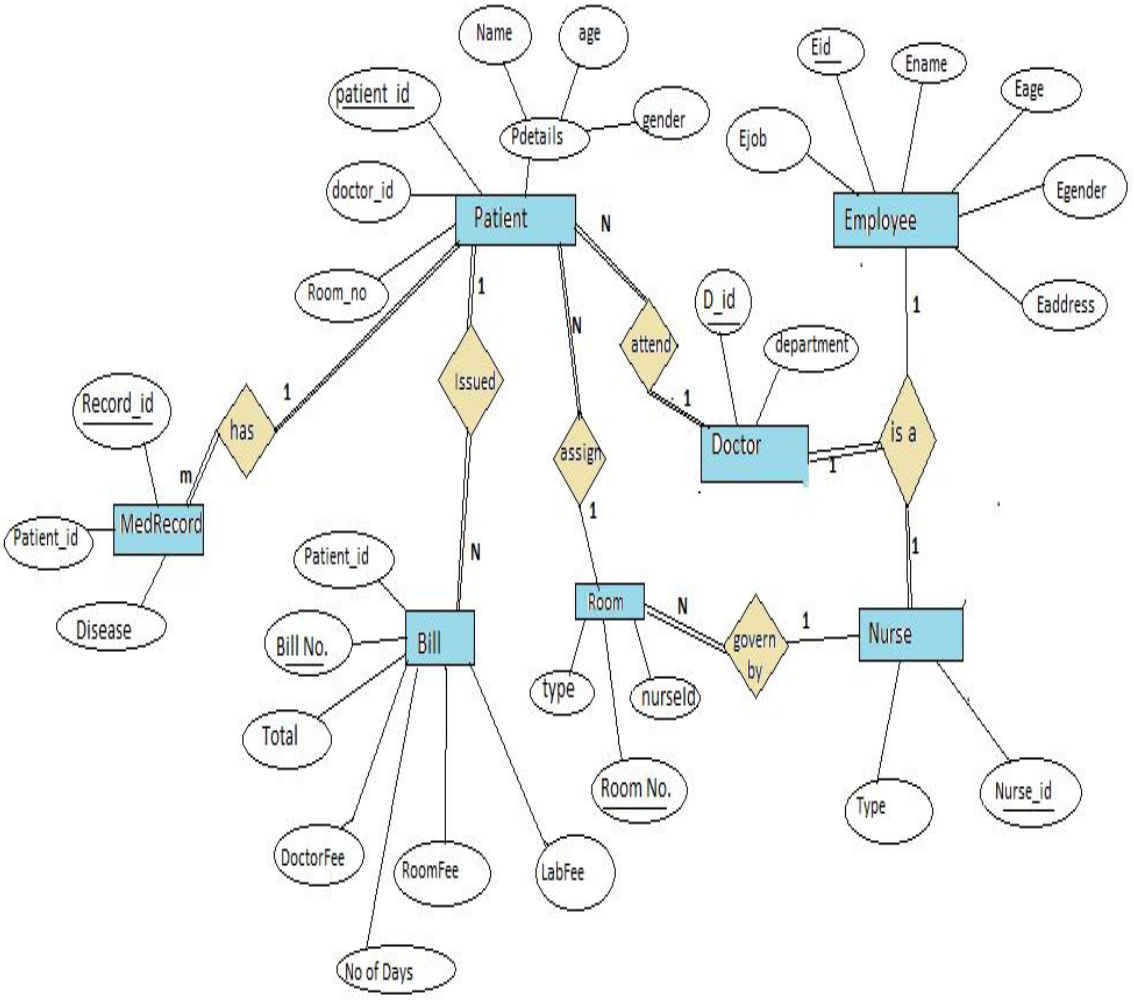
SPECIFIC REQUIREMENTS

It describes all the details that the software developer need to know for designing and developing the system. This section Describe the software or language used by developer.

--NO Front-End.

- Oracle live online .
- Pl SQL for Back-end programming.

ER Diagram of Hospital Management System :



For normalied form

Note :- Address here is taken as only as city name . so it is not a composite attribute.

Relational Model:

Conversion of Entity into Relational Model:

Tables:

Denormalized :

Doctor

Attribute	Description	Data type
Doctor_id	Id of Doctor	varchar
Doctor_name	Name	varchar
Doctor_age	Age	number
Doctor_gender	Gender	varchar
Doctor_address	Address	varchar
department	Department	varchar

Nurse

Attribute	Description	Data type
Nurse _id	Id of Nurse	varchar
Nurse _name	Name	varchar
Nurse _age	Age	number
Nurse _gender	Gender	varchar
Nurse _address	Address	varchar
Nurse_type	Type of work	varchar

Patient

Attribute	Description	Data type
Patient_Id	Id of patient	varchar

name	Name	varchar
age	Age	number
gender	Gender	varchar
Room No.	Room no. Of patient	number
Disease	Disease to patient	varchar
Doctor_id	Id of Doctor	varchar

Room

Attribute	Description	Data type
Room No.	Number of room	number
R_type	Type of Room	varchar
Nurse_id	Id of nurse	varchar

Bill

Attribute	Description	Data type
Patient_Id	Id of patient	varchar
Bill_no	No. On bill recipt	number
No_of_days	Number of days Patient admitted	Number
Doctor_charge	Doctor's Fee	number
Lab_charge	Lab's Fee	number
Room_charge	Room Fee	number
Total	Total amount	number

As seen from above table some data can be redundant

So Normalization is require.

Himanshu

Normalization of Relational Model

All the FD's of table is given below:

For Doctor table:

(doctor_id,department) --> (doctor_name,doctor_age,doctor_gender,doctor_address)

For Nurse table:

(nurse_id,nurse_type) --> (nurse_name,nurse_age,nurse_gender,nurse_address)

For Patient table:

(patient_id) --> (name,age,gender,room_no,disease,doctor_id)

For Bill table:

(Bill_no) --> (no_of_days,patient_id,doctor_charge,room_charge,lab_charge,total)

For Room table :

(room_no) --> (nurse_id,r_type)

1NF:

Patient table is not in 1NF state as **disease** attribute may have more than one value as a person may have more than one disease at same time.

So we decompose patient table as follows:

Patient --> Patient,MedRecord.

Patient table

(patient_id) --> (name,age,gender,room_no,disease,doctor_id)

MedRecord table

(record_id) --> (patient_id,disease)

Patient table divide in two table Patient and MedRecord

As follows:

Patient

Attribute	Description	Data type

Patient_Id	Id of patient	varchar
name	Name	varchar
age	Age	number
gender	Gender	varchar
Room No.	Room no. Of patient	number
Doctor_id	Id of Doctor	varchar

MedRecord

Attribute	Description	Data type
Patient_Id	Id of patient	varchar
Disease	Disease	varchar
Record_id	Id of record	varchar

All Other Tables **Bill , Doctor , Nurse , Room** will remain same.
So 1NF contains table :
Bill , Doctor , Nurse , Room , Patient , MedRecord.

2NF:

for Doctor table candidate key is {doctor_id,department} and for Nurse table candidate key {nurse_id,nurse_type}
And thier is also dependency from doctor_id and nurse_id too.
As Doctor and Nurse table contain partial dependecies hence it these two table are not in 2NF state .

Converting Doctor and Nurse into 2NF:
Doctor table can be decomposed into two table Doctor_info , Doctor
Similarly Nurse table can be decompose into Nurse_info , Nurse.

But both Nurse_info and Doctor_info contain similar data and attribute so Doctor_info and Nurse_info table becomes a single table Employee.

Doctor , Nurse ---> Doctor,Nurse,Employee.

Employee

Attribute	Description	Data type
Eid	Id of em[ployee	varchar
Ename	Name	varchar
Eage	Age	number
Egender	Gender	varchar
Eaddress	Address	varchar
E_type	Type Employee	varchar

Doctor

Attribute	Description	Data type
doctor _id	Id of doctor	varchar
Department	department	varchar

Nurse

Attribute	Description	Data type
Nurse _id	Id of Nurse	varchar
Nurse_type	Type of work	varchar

Other Tables **Bill , Room , Patient , MedRecord** will remain same.
So 2NF contain Tables :
Bill , Room , Patient , MedRecord , Employee , Doctor , Nurse.

3NF:

None of the above table contains transitive dependency so it is already in 3NF state.

So 3NF contain Tables :

Bill , Room , Patient , MedRecord , Employee , Doctor , Nurse.

BCNF:

In All of the above table the dependencies have only candidate key in left side of dependency so it is already in BCNF.

So BCNF contain Tables :

Bill , Room , Patient , MedRecord , Employee , Doctor , Nurse.

After Normalization final tables are :

Employee

Attribute	Description	Data type	Condition
Eid	Id of employee	varchar	Primary key
Ename	Name	varchar	Not NULL
Eage	Age	number	Not Null
Egender	Gender	varchar	Not Null
Eaddress	Address	varchar	
Ejob	Type of Employee	varchar	Not NULL

Doctor

Attribute	Description	Data type	Condition
doctor _id	Id of doctor	varchar	Primary key
Department	department	varchar	Not Null

Nurse

Attribute	Description	Data type	Condition
Nurse _id	Id of Nurse	varchar	Primary key
Nurse_type	Type of work	varchar	Not Null

Patient

Attribute	Description	Data type	Condition
Patient_Id	Id of patient	varchar	Primary key
name	Name	varchar	Not NULL
age	Age	number	Not NULL
gender	Gender	varchar	Not NULL
Room No.	Room no. Of patient	number	Foreign key (Room)
Doctor_id	Id of Doctor	varchar	Foreign key

MedRecord

Attribute	Description	Data type	Condition
Patient_Id	Id of patient	varchar	foreign key
Disease	Disease to patient	varchar	Not Null
Record_id	Id of record	varchar	Primary key

Room

Attribute	Description	Data type	Condition
Room No.	Number of room	number	Primary key
R_type	Type of Room	varchar	Not NULL
Nurse_id	Id of nurse	varchar	Foreign key

Bill

Attribute	Description	Data type	Condition
Patient_Id	Id of patient	varchar	Foreign key
Bill_no	No. On bill recipt	number	Primary key
No_of_days	Number of days Patient admitted	Number	Not NULL
Doctor_charge	Doctor's Fee	number	Not NULL
Lab_charge	Lab's Fee	number	Not NULL
Room_charge	Room Fee	number	Not NULL
Total	Total amount	number	Not NULL

Key Constraints :

primary Keys , foreign Key , null , Unique constraints are already included in the above tables.