VNRVJIET

Hospital Management System

Discover the importance of Hospital Management Systems with our innovative database management system project.

Team Members

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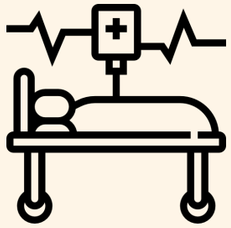


Objectives and Scope

1 Efficiency

We aim to reduce complexity and improve efficiency between administrative and medical staff.

2 Accuracy

We strive for accurate data management and analysis to optimize patient care and safety.

3 Accessibility

Our system is designed to be accessible, user-friendly, and secure.

Database Design and Management

1

ER Diagram

An Entity Relationship Diagram that shows the relationship between all the tables of our database.

2

Normalization

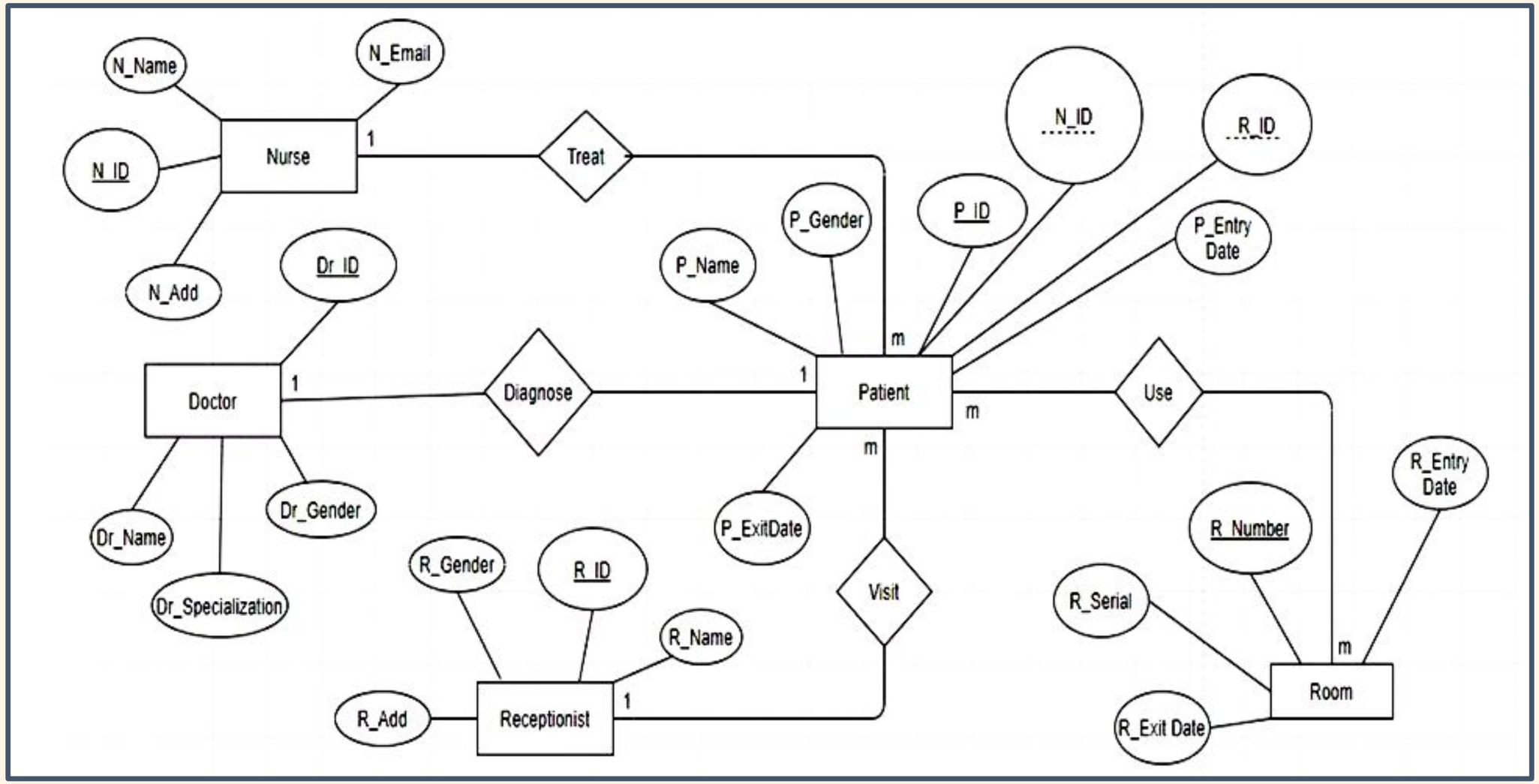
The process of normalization to reduce data redundancy and improve data integrity.

3

SQL Commands

A list of SQL commands used for creating, inserting, updating, and deleting data from the database.

ER Diagram


N_Name
N_Email
N_ID
Nurse
1
Treat
N_Add
Dr_ID
P_Gender
P_Name
N_ID
P_ID
R_ID
P_Entry Date
m
Doctor
1
Diagnose
1
Patient
Use
m
m
Dr_Name
Dr_Gender
Dr_Specialization
P_ExitDate
Visit
R_Entry Date
R_Number
R_Gender
R_ID
R_Name
R_Serial
m
R_Add
Receptionist
1
Room
R_Exit Date

REQUIREMENTS

- SQL
- Oracle Database 21c for Microsoft Windows x64 (64-bit)

- Information about Patients is done by just writing the `Patient's name, age,` and `gender`. Whenever the Patient comes up his information is stored freshly.
- Bills are generated by recording the price for each facility provided to the Patient on a separate sheet and at last, they all are summed up.
- Diagnosis information to patients is generally recorded on the document, which contains Patient information. It is destroyed after some time period to decrease the paper load in the office.
- Immunization records of children are maintained in pre-formatted sheets, which are kept in a file.
- Information about various diseases is not kept as any document. Doctors themselves do this job by remembering various medicines.

CREATING TABLES

```
create table hospital
(
    hosp_name varchar(30)
primary key,
    branch_head char (20),
    hos_zip int,
    hos_city varchar(30),
    hos_state varchar(50)
);
```

```
mysql> show tables;
+---------------+
| Tables_in_vnr |
+---------------+
| appointment   |
| diagnosis     |
| doctor        |
| examine       |
| hospital      |
| medicine      |
| nurse         |
| patient       |
| reception     |
+---------------+
```

INSERTING VALUES

```
insert into hospital values
(‘apollo’,’ram’,500096, ‘film
nagar, hyderabad’, ‘telangana
‘);
("yashoda",” prabha”,500003,
"alexander rd, kummari guda,
secunderabad”, “telangana "),
("nims",” vdk”,500082,
“punjagutta market, punjagutta,
hyderabad”, “telangana ");
```

```
mysql> select * from hospital;
+-----------+-------------+---------+----------------------+-----------+
| hosp_name | branch_head | hos_zip | hos_city             | hos_state |
+-----------+-------------+---------+----------------------+-----------+
| apollo    | ram         |  500096 | Film Nagar, hyd      | telangana |
| Nims      | VDK         |  500082 | Punjagutta, Hyderabad | Telangana |
| Yashoda   | PRABHA      |  500003 | Secunderabad         | Telangana |
+-----------+-------------+---------+----------------------+-----------+
```

Doctors table

```
mysql> desc doctor
    -> ;
+--------------------+-------------+------+-----+---------+-------+
| Field              | Type        | Null | Key | Default | Extra |
+--------------------+-------------+------+-----+---------+-------+
| doc_id             | int         | NO   | PRI | NULL    |       |
| dname              | varchar(30) | YES  |     | NULL    |       |
| gender             | char(1)     | YES  |     | NULL    |       |
| age                | int         | YES  |     | NULL    |       |
| qualification      | varchar(30) | YES  |     | NULL    |       |
| job_specification  | varchar(30) | YES  |     | NULL    |       |
| hosp_name          | varchar(30) | YES  | MUL | NULL    |       |
+--------------------+-------------+------+-----+---------+-------+
```

DOC_ID	DNAME	GENDER	AGE	QUALIFICA-TION	JOB_SPECIFICATION	HOSP_NAME
01	Chandana	F	23	MBBS	Cardiologist, Endocrinologists	Apollo
02	Rakesh	M	25	Board Certified	Neurosurgeon, Gastroenterologists	Nims
03	Varshitha	F	24	MD	Paediatrician, Oncologists	Yashoda
04	Waseem	M	26	BPT	Physiotherapist	Nims

NORMALIZATION

1NF

- A relation will be in 1NF if it contains an atomic value
- It states that an attribute of a table cannot hold multiple values. It must hold only single-valued attribute.
- In the doctor table the job specification attribute has multiple data or values.

DOC_ID	DNAME	GENDER	AGE	QUALIFICATION	JOB_SPECIFICATION	HOSP_NAME
01	Chandana	F	23	MBBS	Cardiologist	Apollo
01	Chandana	F	23	MBBS	Endocrinologists	Apollo
02	Rakesh	M	25	Board Certified	Neurosurgeon	Nims

2NF

- A relation will be 1NF if it contains an atomic value.
- In the second normal form, all non-key attributes are fully functional dependent on the primary key.
- In the doctor table, if we consider DOC_ID and AGE and job_Specification, non-prime attribute AGE by determined by DOC_ID which is a proper subset of a candidate key. That's why it violates the rule for 2NF.

DOC_ID	AGE	GENDER	QUALIFICATION
01	23	F	MBBS
02	25	M	Board Certified
03	24	F	MD

JOB_SPECIFICATION	DNAME	HOSP_NAME
Cardiologist	Chandana	Apollo
Endocrinologists	Chandana	Apollo
Neurosurgeon	Rakesh	Nims
Gastroenterologists	Rakesh	Nims
Paediatrician	Varshitha	Yashoda
Oncologists	Varshitha	Yashoda
Physiotherapist	Waseem	Nims

3NF

- A relation will be in 3NF if it is in 2NF and not contain any transitive partial dependency.
- 3NF is used to reduce the data duplication. It is also used to achieve the data integrity.
- If there is no transitive dependency for non-prime attributes, then the relation must be in third normal form.

The Hospital Table all attributes except `HOSP_NAME` are non-prime.

Here, `HOS_CITY & HOS_STATE` dependent on `HOS_ZIP` and `HOS_ZIP` dependent on `HOS_NAME`. The non-prime attributes `(HOS_CITY & HOS_STATE)` transitively dependent on super key `(HOS_NAME)`. It violates the rule of third normal form.

HOSP_NAME	BRANCH HEAD	HOS_ZIP
Apollo	RAM	500096
Yashoda	PRABHA	500003

HOS_ZIP	CITY	STATE
500096	Film Nagar, Hyderabad	Telangana
500003	Alexander Rd, Kummari Guda, Secunderabad	Telangana

BCNF

The Boyce-Codd Normal Form (BCNF) is a refinement of the Third Normal Form (3NF), and it applies the following additional constraint: For every non-trivial functional dependency (X -> Y) in a relation, X must be a superkey. A superkey is a set of attributes that uniquely identifies each tuple (row) in the table.

It should satisfy all the conditions of the Third Normal Form (3NF).

For any functional dependency (A->B), A should be either the super key or the candidate key. In simple words, it means that A can't be a non-prime attribute if B is given as a prime attribute.

Functionalities of the System

Administrative Functions

- Patient registration and appointment scheduling
- Invoice management and billing
- Inventory and supply chain management
- Staff management

Medical Functions

- Electronic Medical Records (EMR)
- Prescription and medication management
- Laboratory and test results management
- Bed and ward management

Conclusion

Thus, we conclude this project that describes and showcases the basic structure of a hospital management system. We see how databases are created and normalised further for easier access to professionals. We can also understand the levels of abstraction within the database.