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Table of Contents

List of Figures

List of Tables

1. Introduction

1.1 Database

A database is a collection of data or information that is specially organized for rapid search and retrieval whenever required. They are stored as a file or a set of files.

(Tutorialspoint, 2012)

They are structured to facilitate the storage, retrieval, modification and deletion of data in conjunction with various data-processing operations. Many users of a large database must be able to manipulate the information within it quickly at any given time. Moreover, large business and other organizations tend to build up many independent files containing related and even overlapping data and their data-processing activities often require the linking of data from several files. A database system is an integrated collection of related files, along with details of the interpretation of the data contained therein.   (Guru99, 2013)

Basically, database system is nothing more than a computer-based record keeping system i.e. a system whose overall purpose is to record and maintain information. Several types of Database Management System(DBMS) have been developed to support these requirements: flat, hierarchical, network, relational and object-oriented.   (c-sharpcorner, 2014)

1.2 Description of Organizational Database

A database related to hospital management system is developed for its smooth performance. This database is about the different information regarding the patients demographics, diagnoses, procedures, admission sources, discharge status and length of stay of patients. So there won't be any problem in upcoming future to obtain any data source related to the hospital management system. Database in hospital helps to keep the track record for the future reference and make some changes in the organization for its overall functions whenever required. Database plays a vital role as it is very easy to include and exclude the various data.   (geeksforgeeks, 2015)

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The database of Hospital Management System consists of five entities they are: Doctor, Patient, Medicine, Medical Record and Employee. The concept for the database is quite simple. The whole operations and functions carried in hospital is recorded in hospital database in organized way for the future reference.

Doctors are one of the most important entities of hospital and plays a significant role in database. Doctor examines the patient. One doctor can examines many patient. Therefore, a doctor and patients have one-to-many relationship. Also, patients intakes different medicines. So, patients and medicines have many-to-many relationship. Similarly, a hospital consists of many working employees. So, a systematic medical record should be maintain for specific employees. Therefore, Employee and medical record has one-to-many relationship.

So, the database in hospital management system represents and defines the relations among different entities and stores the essential data in a systematic order for the future reference. All the entities used have different attributes. The Doctor entity consists of six attributes. The Doctor ID is the primary key that is auto incremented and stores INT datatype value. First Name, Middle Name, Last Name, Specialization and Qualification stores String datatype values.

Patients are counted as an important entities in health management system. It consists of attributes like Patient ID, Full Name, Age, Phone no. Patient ID is the primary key and stores INT datatype value. Phone no. of each patients is distinct so unique constraint is given.

Medicine directly responsible to improve the healthy living status of any person. It requires a special place in database. It consist of four attributes i.e. Price, Quantity, Code, Description. Price and quantity stores INT datatypes. Similarly, code for specific medicine is distinct so Unique constraint is given.

Employee are counted as such entities which enhances the hospital management. It contains six attributes. Employee ID is the primary key that is auto incremented and stores INT datatype value. FirstName, Last Name stores String datatype values. Salary stores INT datatype. Contact no. for specific employee is distinct so unique constraint is given.

Medical Record are the set of data and raw facts which helps to track the record. It consists of five attributes. Record ID is the primary key auto and is incremented whereas the Patient ID, Doctor ID and Employee ID is foreign keys. Record ID for each medical record should be distinct so Unique constraint is given. Date of examination stores date so Date datatype is given.

1.3 Goals and Objectives

Hospital is an institution that is built, staffed, equipped for the diagnosis of disease and treatment and plays a significant role to maintain or establish an individual with quality healthy life. So, a systematic and organised database need to be implement to carry out and manage their operations. That's why a database related to hospital management system is assumed for its smooth performance.

(britannica, 2016)

The main goal of this report is to make a systematic, organised and standard database related to hospital and its management system which will somehow provide an outline structure of hospital. This database tries to contribute in providing the different information like how the records of various doctors, patients, employees and other workers are kept and presented whenever required in future. It stores the information related to examination date, medication, surgery and hospitalization reports. Each transaction is stored securely in the database and can be queried separately. With parametric query screens and search forms, search options are offered via multiple options (Name, Gender etc). The user-friendly, flexible and convenient search interface provides fast and easy access to information.

(dspace.khazar, 2017)

2. Database Model

2.1 Rules of Business

The organization Hospital is a medical institution which contributes a lot by providing quality health facilities to the people. Doctors in the hospital examines various patients according to patients critical condition and suggest them to intake needed medicines for their good health. A lot of employees works in the hospital for its overall performance.

2.2 Entity Relation Model
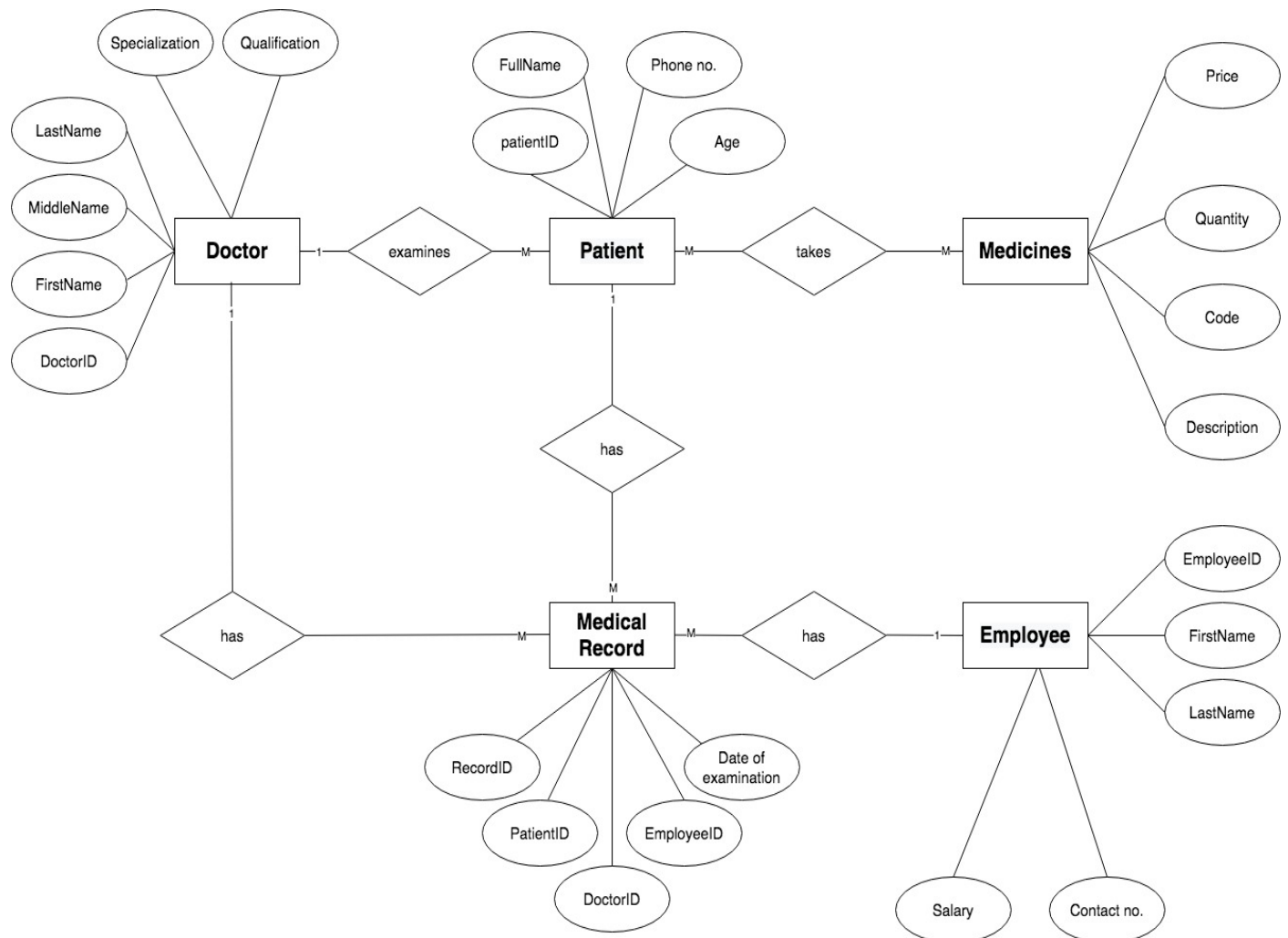
Figure 1:ERD for Hospital Management System

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2.3 Relational Diagram
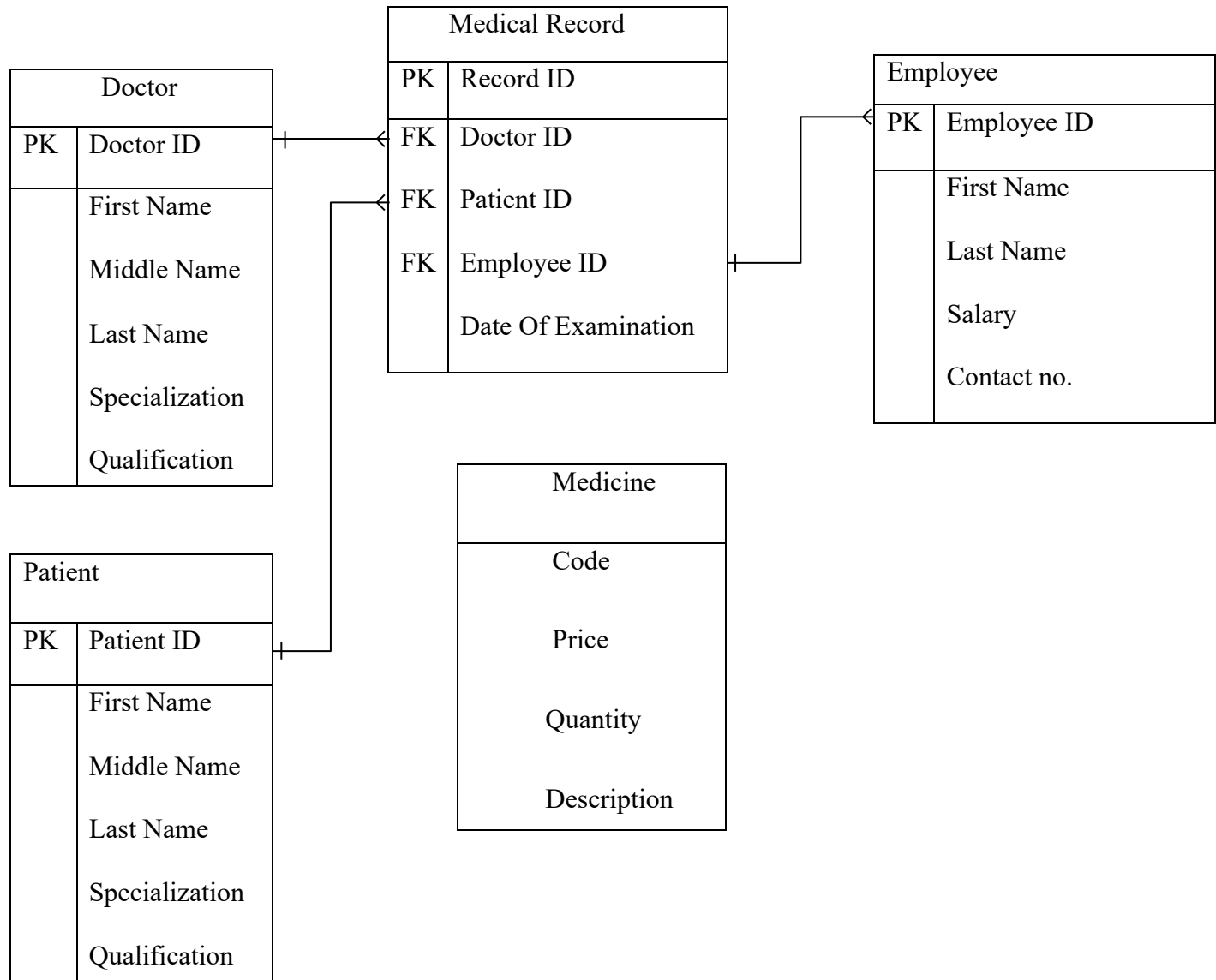
Figure 2: Relational Diagram of Hospital

2.4 Inserting and Creating Database and Data

- HOSPITAL

```
[MariaDB [(none)]> CREATE DATABASE HOSPITAL;
Query OK, 1 row affected (0.001 sec)

[MariaDB [(none)]> USE HOSPITAL;
Database changed
MariaDB [HOSPITAL]>
```

Figure 3: Creation of New Database HOSPITAL

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- Doctor

  - Creating Doctor table

```
[MariaDB [Hospital]> CREATE TABLE Doctor(
[    -> DoctorID INT PRIMARY KEY AUTO_INCREMENT,
[    -> FirstName VARCHAR(255) NOT NULL,
[    -> MiddleName VARCHAR(255),
[    -> LastName VARCHAR(255) NOT NULL,
[    -> Specialization VARCHAR(255) NOT NULL,
[    -> Qualification VARCHAR(255) NOT NULL);
Query OK, 0 rows affected (0.101 sec)

MariaDB [Hospital]>
```

*Figure 4: Creation of table **Doctor***

  - Describing Doctor table

```
[MariaDB [Hospital]> DESCRIBE Doctor;
+----------------+--------------+------+-----+---------+----------------+
| Field          | Type         | Null | Key | Default | Extra          |
+----------------+--------------+------+-----+---------+----------------+
| DoctorID       | int(11)      | NO   | PRI | NULL    | auto_increment |
| FirstName      | varchar(255) | NO   |     | NULL    |                |
| MiddleName     | varchar(255) | YES  |     | NULL    |                |
| LastName       | varchar(255) | NO   |     | NULL    |                |
| Specialization | varchar(255) | NO   |     | NULL    |                |
| Qualification  | varchar(255) | NO   |     | NULL    |                |
+----------------+--------------+------+-----+---------+----------------+
6 rows in set (0.045 sec)

MariaDB [Hospital]>
```

*Figure 5: Description of table **Doctor***

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o   Inserting values into Doctor table

```
[MariaDB [HOSPITAL]> INSERT INTO Doctor (FirstName, MiddleName, LastName, Specialization, Qualification) VALUES
[    -> ("Karma", "Raj", "Giri", "Dermatologists", "FAAD"),
[    -> ("Yuvvraj", "", "Adhikari", "Ophthalmologists", "M.D."),
[    -> ("Alex", "", "Gordan", "Cardiologists", "D.M."),
[    -> ("Gokarna", "Raj", "Bista", "Gynecologists", "Diploma"),
[    -> ("Abikal", "Bikram", "Saahi", "Surgery", "M.D. in Surgery"),
[    -> ("Kasham", "Jung", "Malla", "Gastroenterologists", "D.O."),
[    -> ("Bhim", "", "Bista", "Nephrologists", "ABIM"),
[    -> ("Sanjay", "", "Tamang", "Urologists", "MCAT"),
[    -> ("Abhishek", "Kumar", "Yadav", "Neurologists", "GMC"),
[    -> ("Bibek", "Raj", "Joshi", "Psychiatrists", "MBBS");
Query OK, 10 rows affected (0.005 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [HOSPITAL]> █
```

*Figure 6: Inserting values into table **Doctor***

o   Displaying records of Doctor

```
[MariaDB [HOSPITAL]> select * from Doctor;
+----------+-----------+------------+----------+---------------------+-----------------+
| DoctorID | FirstName | MiddleName | LastName | Specialization      | Qualification   |
+----------+-----------+------------+----------+---------------------+-----------------+
|        1 | Karma     | Raj        | Giri     | Dermatologists      | FAAD            |
|        2 | Yuvvraj   |            | Adhikari | Ophthalmologists    | M.D.            |
|        3 | Alex      |            | Gordan   | Cardiologists       | D.M.            |
|        4 | Gokarna   | Raj        | Bista    | Gynecologists       | Diploma         |
|        5 | Abikal    | Bikram     | Saahi    | Surgery             | M.D. in Surgery |
|        6 | Kasham    | Jung       | Malla    | Gastroenterologists | D.O.            |
|        7 | Bhim      |            | Bista    | Nephrologists       | ABIM            |
|        8 | Sanjay    |            | Tamang   | Urologists          | MCAT            |
|        9 | Abhishek  | Kumar      | Yadav    | Neurologists        | GMC             |
|       10 | Bibek     | Raj        | Joshi    | Psychiatrists       | MBBS            |
+----------+-----------+------------+----------+---------------------+-----------------+
10 rows in set (0.060 sec)

MariaDB [HOSPITAL]> █
```

*Figure 7: Displaying records of **Doctor***

KARMARAJ GIRI

- Patient

  o Creating Patient table

```
[MariaDB [HOSPITAL]>  CREATE TABLE Patient (
    -> PatientID INT(11) PRIMARY KEY,
    -> FullName VARCHAR(255),
    -> Phoneno INT(11) UNIQUE NOT NULL,
[   -> Age INT(11) NOT NULL);
[Query OK, 0 rows affected (0.095 sec)
[
[MariaDB [HOSPITAL]>
```

*Figure 8: Creating **Patient** table*

  o Describing Patient table

```
[
[MariaDB [HOSPITAL]> DESCRIBE Patient;
[+-----------+--------------+------+-----+---------+-------+
 | Field     | Type         | Null | Key | Default | Extra |
 +-----------+--------------+------+-----+---------+-------+
[| PatientID | int(11)      | NO   | PRI | NULL    |       |
 | FullName  | varchar(255) | YES  |     | NULL    |       |
 | Phoneno   | int(11)      | NO   | UNI | NULL    |       |
 | Age       | int(11)      | NO   |     | NULL    |       |
 +-----------+--------------+------+-----+---------+-------+
4 rows in set (0.047 sec)

MariaDB [HOSPITAL]>
```

*Figure 9: Description of **Patient** table*

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o   Inserting values into Patient

```
MariaDB [HOSPITAL]> INSERT INTO Patient (PatientID, FullName, Phoneno, Age) VALUES
    -> (03, "Raghav Yonjan", "983423424", "45"),
    -> (09, "Sundar Pichai", "92423234", "34"),
    -> (11, "Sriram Kandel", "09409204", "29"),
[   -> (15, "Hariram Kadari", "95675643", "20"),
[   -> (17, "Harke Haldar", "932453425", "29"),
[   -> (19, "Shyam Sundar", "924234", "31"),
[   -> (21, "Santosh Bista", "91930912", "46"),
[   -> (23, "Nitesh Bajracharya", "9234265", "55"),
[   -> (25, "Subarna Yadav", "97567567", "56"),
[   -> (33, "Abhinav Das", "979789", "23");
[Query OK, 10 rows affected (0.003 sec)
[Records: 10  Duplicates: 0  Warnings: 0
[
[MariaDB [HOSPITAL]> █
```

*Figure 10: Inserting values into **Patient***

o   Displaying records of Patient

```
[
[MariaDB [HOSPITAL]> SELECT * FROM Patient;
+-----------+--------------------+-----------+-----+
| PatientID | FullName           | Phoneno   | Age |
+-----------+--------------------+-----------+-----+
|         3 | Raghav Yonjan      | 983423424 |  45 |
|         9 | Sundar Pichai      |  92423234 |  34 |
|        11 | Sriram Kandel      |   9409204 |  29 |
|        15 | Hariram Kadari     |  95675643 |  20 |
|        17 | Harke Haldar       | 932453425 |  29 |
|        19 | Shyam Sundar       |    924234 |  31 |
|        21 | Santosh Bista      |  91930912 |  46 |
|        23 | Nitesh Bajracharya |   9234265 |  55 |
|        25 | Subarna Yadav      |  97567567 |  56 |
|        33 | Abhinav Das        |    979789 |  23 |
+-----------+--------------------+-----------+-----+
10 rows in set (0.001 sec)

MariaDB [HOSPITAL]> █
```

*Figure 11: Displaying records of **Patient***

KARMARAJ GIRI

- Medicine

    o Creating Medicine table

```
MariaDB [HOSPITAL]> CREATE TABLE Medicine (
    -> Code INT UNIQUE NOT NULL,
    -> Price INT(11) NOT NULL,
    -> Quantity INT(11) NOT NULL,
[   -> Description VARCHAR(255) NOT NULL);
[Query OK, 0 rows affected (0.406 sec)
[
[MariaDB [HOSPITAL]>
```

*Figure 12: Creating **Medicine** table*

    o Describing Medicine table

```
l
[MariaDB [HOSPITAL]> DESCRIBE Medicine;
+-------------+--------------+------+-----+---------+-------+
| Field       | Type         | Null | Key | Default | Extra |
+-------------+--------------+------+-----+---------+-------+
| Code        | int(11)      | NO   | PRI | NULL    |       |
| Price       | int(11)      | NO   |     | NULL    |       |
| Quantity    | int(11)      | NO   |     | NULL    |       |
| Description | varchar(255) | NO   |     | NULL    |       |
+-------------+--------------+------+-----+---------+-------+
4 rows in set (0.100 sec)

MariaDB [HOSPITAL]>
```

*Figure 13: Description of **Medicine** table*

    o Inserting values into Medicine table

```
[MariaDB [HOSPITAL]> INSERT INTO Medicine (Code, Price, Quantity, Description) VALUES
[   -> (00023, "299", "9", "Pain Killer"),
[   -> (00045, "499", "10", "Diagnosis"),
[   -> (000909, "345", "15", "Infection"),
[   -> (09090, "399", "22", "Swelling"),
[   -> (98800, "245", "13", "Nausea"),
[   -> (202020, "676", "14", "Vomitting"),
[   -> (1231, "688", "11", "Vitamin");
Query OK, 7 rows affected (0.313 sec)
Records: 7  Duplicates: 0  Warnings: 0
```

*Figure 14: Inserting values into **Medicine** table*

KARMARAJ GIRI

o   Displaying records of Medicine table

```
[MariaDB [HOSPITAL]> SELECT * FROM Medicine;
+--------+-------+----------+-------------+
| Code   | Price | Quantity | Description |
+--------+-------+----------+-------------+
|     23 |   299 |        9 | Pain Killer |
|     45 |   499 |       10 | Diagnosis   |
|    909 |   345 |       15 | Infection   |
|   1231 |   688 |       11 | Vitamin     |
|   9090 |   399 |       22 | Swelling    |
|  98800 |   245 |       13 | Nausea      |
| 202020 |   676 |       14 | Vomitting   |
+--------+-------+----------+-------------+
7 rows in set (0.001 sec)
```

*Figure 15: Displaying records of **Medicine***

- Employee

  o   Creating Employee table

```
[MariaDB [HOSPITAL]> CREATE TABLE Employee (
[      -> EmployeeID INT(11) PRIMARY KEY,
[      -> FirstName VARCHAR(255),
       -> LastName VARCHAR(255),
       -> Salary DECIMAL(10,2),
[      -> Contactno INT(11));
[Query OK, 0 rows affected (0.192 sec)
[
```

*Figure 16: Creation of table **employee***

  o   Describing Employee table

```
[
[MariaDB [HOSPITAL]> DESCRIBE Employee;
[+------------+--------------+------+-----+---------+-------+
[| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| EmployeeID | int(11)      | NO   | PRI | NULL    |       |
[| FirstName  | varchar(255) | YES  |     | NULL    |       |
| LastName   | varchar(255) | YES  |     | NULL    |       |
| Salary     | decimal(10,2)| YES  |     | NULL    |       |
| Contactno  | int(11)      | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
5 rows in set (0.081 sec)
```

*Figure 17: Description of table **employee***

KARMARAJ GIRI

o   Inserting values into Employee table

```
[MariaDB [HOSPITAL]> INSERT INTO Employee (EmployeeID, Firstname, LastName, Salary, Contactno) VALUES
[    -> (111, "Govardhan", "Giri", "25000.45", "9009891"),
[    -> (222, "Gaurav", "Gautam", "35000.45", "900989122"),
[    -> (333, "Ganga", "Gurung", "45000.45", "923423891"),
[    -> (444, "Gangajal", "Shakya", "55000.45", "9578891"),
[    -> (555, "Yoddha", "yadav", "6745.99", "95757"),
[    -> (666, "Gautam", "Gulati", "65000.45", "9006"),
[    -> (777, "Abhishek", "Shah", "75000.45", "90095656"),
[    -> (888, "Amresh", "Ghimire", "725000.45", "900984591"),
[    -> (999, "Goma", "Kadari", "525000.45", "90095891"),
[    -> (345, "Supriya", "Kishori", "88867.8", "900935891");
Query OK, 10 rows affected (0.059 sec)
Records: 10  Duplicates: 0  Warnings: 0
```

*Figure 18: Inserting values into **Employee** table*

o   Displaying records of Employee table

```
[MariaDB [HOSPITAL]> SELECT * FROM Employee;
+------------+-----------+----------+-----------+-----------+
| EmployeeID | FirstName | LastName | Salary    | Contactno |
+------------+-----------+----------+-----------+-----------+
|        111 | Govardhan | Giri     |  25000.45 |   9009891 |
|        222 | Gaurav    | Gautam   |  35000.45 | 900989122 |
|        333 | Ganga     | Gurung   |  45000.45 | 923423891 |
|        345 | Supriya   | Kishori  |  88867.80 | 900935891 |
|        444 | Gangajal  | Shakya   |  55000.45 |   9578891 |
|        555 | Yoddha    | yadav    |   6745.99 |     95757 |
|        666 | Gautam    | Gulati   |  65000.45 |      9006 |
|        777 | Abhishek  | Shah     |  75000.45 |  90095656 |
|        888 | Amresh    | Ghimire  | 725000.45 | 900984591 |
|        999 | Goma      | Kadari   | 525000.45 |  90095891 |
+------------+-----------+----------+-----------+-----------+
10 rows in set (0.001 sec)
```

*Figure 19: Displaying records of **Employee** table*

KARMARAJ GIRI

- Medical Record

  o Creating Medical Record table

```
MariaDB [HOSPITAL]> CREATE TABLE MedicalRecord(
[    -> RecordID INT(11) PRIMARY KEY,
[    -> PatientID INT(11),
[    -> DoctorID INT(11),
[    -> EmployeeID INT(11),
[    -> DateOfExamination DATE,
[    -> FOREIGN KEY (PatientID) REFERENCES Patient(PatientID),
[    -> FOREIGN KEY (DoctorID) REFERENCES Doctor(DoctorID),
[    -> FOREIGN KEY (EmployeeID) REFERENCES Employee(EmployeeID));
Query OK, 0 rows affected (0.199 sec)
```

*Figure 20: Creating **Medical Record** table*

  o Describing Medical Record table

```
[MariaDB [HOSPITAL]> DESCRIBE MedicalRecord;
+-------------------+---------+------+-----+---------+-------+
| Field             | Type    | Null | Key | Default | Extra |
+-------------------+---------+------+-----+---------+-------+
| RecordID          | int(11) | NO   | PRI | NULL    |       |
| PatientID         | int(11) | YES  | MUL | NULL    |       |
| DoctorID          | int(11) | YES  | MUL | NULL    |       |
| EmployeeID        | int(11) | YES  | MUL | NULL    |       |
| DateOfExamination | date    | YES  |     | NULL    |       |
+-------------------+---------+------+-----+---------+-------+
5 rows in set (0.309 sec)
```

*Figure 21: Describing **Medical Record** table*

  o Inserting Values into Medical Record

```
[MariaDB [HOSPITAL]> INSERT INTO MedicalRecord (RecordID, PatientID, DoctorID, EmployeeID, DateOfExamination) VALUES
[    -> (1000, 3, 1, 111, "1990-09-03"),
[    -> (1001, 9, 2, 222, "1991-10-04"),
[    -> (1002, 11, 3, 333, "1992-01-05"),
[    -> (1003, 15, 4, 345, "1993-05-06"),
[    -> (1004, 17, 5, 444, "1993-07-06"),
[    -> (1005, 19, 6, 555, "1994-09-04"),
[    -> (1006, 21, 7, 666, "1994-10-03"),
[    -> (1007, 23, 8, 777, "1995-01-10"),
[    -> (1008, 25, 9, 888, "1995-04-11"),
[    -> (1009, 33, 10, 999, "1996-09-03");
Query OK, 10 rows affected (0.102 sec)
Records: 10  Duplicates: 0  Warnings: 0

MariaDB [HOSPITAL]>
```

*Figure 22: Inserting values into **Medical Record** table*

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o   Displaying records of Medical Record table

```
[MariaDB [HOSPITAL]]> SELECT * FROM MedicalRecord;
+----------+-----------+----------+------------+-------------------+
| RecordID | PatientID | DoctorID | EmployeeID | DateOfExamination |
+----------+-----------+----------+------------+-------------------+
|     1000 |         3 |        1 |        111 | 1990-09-03        |
|     1001 |         9 |        2 |        222 | 1991-10-04        |
|     1002 |        11 |        3 |        333 | 1992-01-05        |
|     1003 |        15 |        4 |        345 | 1993-05-06        |
|     1004 |        17 |        5 |        444 | 1993-07-06        |
|     1005 |        19 |        6 |        555 | 1994-09-04        |
|     1006 |        21 |        7 |        666 | 1994-10-03        |
|     1007 |        23 |        8 |        777 | 1995-01-10        |
|     1008 |        25 |        9 |        888 | 1995-04-11        |
|     1009 |        33 |       10 |        999 | 1996-09-03        |
+----------+-----------+----------+------------+-------------------+
10 rows in set (0.011 sec)

MariaDB [HOSPITAL]> ▌
```

*Figure 23: Displaying records of **Medical Record** table*

3. Data Dictionary

A Data Dictionary is a collection of names, definitions and attributes about data elements that are being used or captured in a database, information system or part of a research project. It describes the meanings and purposes of data elements within the context of a project and provides guidance on interpretation, accepted meanings and representation. A data dictionary also provides metadata about data elements. The metadata included in a data dictionary can assist in defining the scope and characteristics of data elements as well the rules for their usage and application.

- Doctor

Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Primary Key	Foreign Key	Null able	Unique	Note

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Doctor	Doctor entity stores all the details about the Doctors that register in Hospital	Doctor ID	Unique ID of the Doctor for identification	INT		True	False	False	True	Auto-Increment
		First Name	First name of the Doctor	VARCHAR	255	False	False	False	False	
		Middle Name	Middle Name of the Doctor	VARCHAR	255	False	False	False	False	
		Last Name	Last Name of the Doctor	VARCHAR	255	False	False	False	False	
		Specialization	Specialization of the Doctor	VARCHAR	255	False	False	False	False	
		Qualification	Qualification of the Doctor	VARCHAR	255	False	False	False	False	

Table 1 Data Dictionary of Doctor

- Patient

Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Primary Key	Foreign Key	Nullable	Unique	Note

KARMARAJ GIRI

Patient	Patient entity stores all the details about the Patients that are admitted in Hospital	Patient ID	Unique ID of the Patient for identification	INT		True	False	False	True	
		Full Name	Full name of the Patient	VARCHAR	255	False	False	False	False	
		Phone no.	Phone number of the Patient	INT		False	False	False	True	
		Age	Age of the Patient	INT		False	False	False	False	

Table 2 Data Dictionary of Patient

- Medicine

Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Primary Key	Foreign Key	Nullable	Unique	Note
Medicine	Medicine entity stores all the details about the	Code	Unique ID of the Medicine for identification	INT		True	False	False	True	

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Medicines of the Hospital	Price	Price of the Medicine	INT		False	False	False	False	
	Quantity	Quantity of the Medicine	INT		False	False	False	True	
	Description	Description of the Medicine	VARCHAR	255	False	False	False	False	

Table 3 Data Dictionary of Medicine

- Employee

Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Primary Key	Foreign Key	Nullable	Unique	Note
Employee	Employee entity stores all the details about the Employees working in the Hospital	Employee ID	Unique ID of the Employee for identification	INT		True	False	False	True	
		First Name	First Name of the Employee	VARCHAR	255	False	False	False	False	

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Last Name	Last Name of the Employee	VARCHAR	255	False	False	False	True	
Salary	Salary of the Employee	DECIMAL	10,2	False	False	False	False	
Contact no.	Contact no. of the Employee	INT		False	False	False	False	

Table 4 Data Dictionary of Employee

- Medical Record

Entity Name	Entity Description	Column Name	Column Description	Data Type	Length	Primary Key	Foreign Key	Null able	Unique	Note
Medical Record	Medical Record entity stores all the details about the Medical Records in the Hospital	Record ID	Unique ID of the Records for identification	INT		True	False	False	True	
		Doctor ID	Unique ID of the Doctor	INT		False	True	False	False	
		Patient ID	Unique ID of the Patient	INT		False	True	False	False	

| | | Employ ee ID | Unique ID of the Employee | INT | | False | True | False | False | |
| | | Date Of Examin ation | Examinatio n date of patients by doctors | DATE | | False | False | False | False | |

Table 5 Data Dictionary of Medical Record

4. Queries

4.1 Query 1

Query No.	Query 1
Query	SELECT * FROM Doctor WHERE LastName LIKE "%i";
Keywords Used	WHERE, LIKE

Table 6 Query 1

```
MariaDB [HOSPITAL]> SELECT * FROM Doctor WHERE LastName LIKE "%i";
+----------+-----------+------------+----------+------------------+------------------+
| DoctorID | FirstName | MiddleName | LastName | Specialization   | Qualification    |
+----------+-----------+------------+----------+------------------+------------------+
|        1 | Karma     | Raj        | Giri     | Dermatologists   | FAAD             |
|        2 | Yuvvraj   |            | Adhikari | Ophthalmologists | M.D.             |
|        5 | Abikal    | Bikram     | Saahi    | Surgery          | M.D. in Surgery  |
|       10 | Bibek     | Raj        | Joshi    | Psychiatrists    | MBBS             |
+----------+-----------+------------+----------+------------------+------------------+
4 rows in set (0.092 sec)

MariaDB [HOSPITAL]>
```

Figure 24: Query 1

4.2 Query 2

Query No.	Query 2
Query	SELECT * FROM Doctor ORDER BY FirstName;
Keywords Used	ORDER BY

Table 7 Query 2

KARMARAJ GIRI

```
MariaDB [HOSPITAL]> SELECT * FROM Doctor ORDER BY FirstName;
+----------+-----------+------------+----------+---------------------+------------------+
|| DoctorID | FirstName | MiddleName | LastName | Specialization      | Qualification    |
+----------+-----------+------------+----------+---------------------+------------------+
||       9 | Abhishek  | Kumar      | Yadav    | Neurologists        | GMC              |
|        5 | Abikal    | Bikram     | Saahi    | Surgery             | M.D. in Surgery  |
|        3 | Alex      |            | Gordan   | Cardiologists       | D.M.             |
|        7 | Bhim      |            | Bista    | Nephrologists       | ABIM             |
|       10 | Bibek     | Raj        | Joshi    | Psychiatrists       | MBBS             |
|        4 | Gokarna   | Raj        | Bista    | Gynecologists       | Diploma          |
|        1 | Karma     | Raj        | Giri     | Dermatologists      | FAAD             |
|        6 | Kasham    | Jung       | Malla    | Gastroenterologists | D.O.             |
|        8 | Sanjay    |            | Tamang   | Urologists          | MCAT             |
|        2 | Yuvvraj   |            | Adhikari | Ophthalmologists    | M.D.             |
+----------+-----------+------------+----------+---------------------+------------------+
10 rows in set (0.299 sec)

MariaDB [HOSPITAL]> █
```

Figure 25: Query 2

4.3 Query 3

Query No.	Query 3
Query	SELECT * FROM Patient WHERE Age BETWEEN 20 AND 45
Keywords Used	WHERE, BETWEEN, AND

Table 8 Query 3

```
MariaDB [HOSPITAL]> SELECT * FROM Patient WHERE Age BETWEEN 20 AND 45;
+-----------+----------------+-----------+-----+
| PatientID | FullName       | Phoneno   | Age |
+-----------+----------------+-----------+-----+
||        3 | Raghav Yonjan  | 983423424 |  45 |
|         9 | Sundar Pichai  |  92423234 |  34 |
|        11 | Sriram Kandel  |   9409204 |  29 |
|        15 | Hariram Kadari |  95675643 |  20 |
|        17 | Harke Haldar   | 932453425 |  29 |
|        19 | Shyam Sundar   |    924234 |  31 |
|        33 | Abhinav Das    |    979789 |  23 |
+-----------+----------------+-----------+-----+
7 rows in set (0.028 sec)

MariaDB [HOSPITAL]> █
```

Figure 26: Query 3

4.4 Query 4

Query No.	Query 4
Query	SELECT * FROM Medicine WHERE Price >=500;
Keywords Used	WHERE, Great or Equal to Operator (>=)

Table 9 Query 4

```
MariaDB [HOSPITAL]> SELECT * FROM Medicine WHERE Price >=500;
+--------+-------+----------+-------------+
| Code   | Price | Quantity | Description |
+--------+-------+----------+-------------+
[|   1231 |   688 |       11 | Vitamin     |
| 202020 |   676 |       14 | Vomitting   |
+--------+-------+----------+-------------+
2 rows in set (0.067 sec)

MariaDB [HOSPITAL]>
```

Figure 27: Query 4

4.5 Query 5

Query No.	Query 5
Query	SELECT * FROM Patient WHERE PatientID IN (9,11,23,33);
Keywords Used	WHERE, IN

Table 10 Query 5

```
MariaDB [HOSPITAL]> SELECT * FROM Patient WHERE PatientID IN (9,11,23,33);
+-----------+-------------------+----------+-----+
| PatientID | FullName          | Phoneno  | Age |
+-----------+-------------------+----------+-----+
[|         9 | Sundar Pichai     | 92423234 |  34 |
|          11 | Sriram Kandel     |  9409204 |  29 |
|          23 | Nitesh Bajacharya |  9234265 |  55 |
|          33 | Abhinav Das       |   979789 |  23 |
+-----------+-------------------+----------+-----+
4 rows in set (0.066 sec)

MariaDB [HOSPITAL]>
```

Figure 28: Query 5

4.6 Query 6

Query No.	Query 6
Query	SELECT FullName, Phoneno FROM Patient ORDER BY FullName DESC LIMIT 5;
Keywords Used	ORDER BY, DESC, LIMIT

Table 11 Query 6

KARMARAJ GIRI

```
MariaDB [HOSPITAL]> SELECT FullName, Phoneno FROM Patient ORDER BY FullName DESC LIMIT 5;
+---------------+----------+
| FullName      | Phoneno  |
+---------------+----------+
[| Sundar Pichai | 92423234 |
| Subarna Yadav | 97567567 |
| Sriram Kandel |  9409204 |
| Shyam Sundar  |   924234 |
| Santosh Bista | 91930912 |
+---------------+----------+
5 rows in set (0.050 sec)

MariaDB [HOSPITAL]>
```

Figure 29: Query 6

4.7 Query 7

Query No.	Query 7
Query	SELECT SUM(Price) FROM Medicine;
Keywords Used	SUM ()

Table 12 Query 7

```
MariaDB [HOSPITAL]> SELECT SUM(Price) FROM Medicine;
+------------+
| SUM(Price) |
+------------+
[|       2806 |
+------------+
1 row in set (0.073 sec)

MariaDB [HOSPITAL]>
```

Figure 30: Query 7

4.8 Query 8

Query No.	Query 8
Query	SELECT COUNT(PatientID) AS Total_Patients FROM Patient;
Keywords Used	COUNT, AS

Table 13 Query 8

```
MariaDB [HOSPITAL]> SELECT COUNT(PatientID) AS Total_Patients FROM Patient;
+----------------+
| Total_Patients |
+----------------+
[|             10 |
+----------------+
1 row in set (0.062 sec)

MariaDB [HOSPITAL]>
```

Figure 31: Query 8

4.9 Query 9

Query No.	Query 9
Query	UPDATE Medicine SET Price = 900 WHERE Code = 1231;
Keywords Used	UPDATE, SET

Table 14 Query 9

```
[MariaDB [HOSPITAL]> SELECT * FROM Medicine WHERE Code = 1231;
+------+-------+----------+-------------+
| Code | Price | Quantity | Description |
+------+-------+----------+-------------+
[| 1231 |   688 |       11 | Vitamin     |
+------+-------+----------+-------------+
1 row in set (0.016 sec)

MariaDB [HOSPITAL]> UPDATE Medicine SET Price = 900 WHERE Code = 1231;
Query OK, 1 row affected (0.063 sec)
Rows matched: 1  Changed: 1  Warnings: 0

[MariaDB [HOSPITAL]> SELECT * FROM Medicine WHERE Code = 1231;
+------+-------+----------+-------------+
| Code | Price | Quantity | Description |
+------+-------+----------+-------------+
[| 1231 |   900 |       11 | Vitamin     |
+------+-------+----------+-------------+
1 row in set (0.053 sec)

MariaDB [HOSPITAL]>
```

Figure 32: Query 9

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5. Conclusion

The Database Management System is an important part of a business because it allows firms to efficiently handle various types of data available. Eventually making it an essential component for firms seeking to improve management systems and further performance levels. IT plays a vital role in improving business performance and functioning in today's time and we can see it all around us. IT not only through its management systems but will further emerging technologies has allowed businesses to benefit from the advancements and become more profitable.

(scientips, 2017)

KARMARAJ GIRI

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