**CHAPTER 1**

**INTRODUCTION**

A healthcare center is looking to develop a state of patient portfolio management system which is able to track their patient’s medical history. This system is to store patient’s detail, this helps the doctors make timely, effective diagnoses. At the same time the center can utilize this system to monitor their medical and financial management.

Currently, different departments in the healthcare center have their own separated systems leading to the lack of communications and the inefficient data sharing. For, example, the finance department uses simple EXCEL spreadsheets to record the paycheck information of the employees which is inconvenient to retrieve and update employees’ information; in the clinic department, the doctors have to write down the prescriptions for the patients and keep paper documents, and also do not have any information about the patients’ insurance plans; the medicine department has to keep the prescriptions and inventory records on their own computer system. While each system serves a distinctive purpose, there is no coordinating, assimilating and representing of data. The systems may have duplicate data which is waste of space. The different systems also may have different application programs which cause incompatible files.

Due to these disadvantages of the current system, a Healthcare Diagnosis Database is proposed. Healthcare Diagnosis Database is a Database Management System (DBMS), which is based on computer networks, using the advanced database technology to construct, maintain and manipulate various kinds of data in a database system (DBS). The DBMS can track and update all the information of recorded patients in the healthcare center during a particular time span. The major advantages of the DBMS are easy to retrieve and update information, efficient data sharing and communication.

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**CHAPTER 2**

**PROBLEM STATEMENT**

**2.1 Objective of the project**

The objective of the project, ‘HEALTHCARE DIAGNOSIS DATABASE’ is:

* The main goal of this project is to improve the existing system.
* To reduce the paper work, in the existing system doctors use paper to write the prescription, this requires lots of files to maintain the patient’s records.
* To reduce time, if a patient’s record need to be searched it takes time to search the records in the file, so this system reduces time.
* To reduce manual power, it’s hard to collect information of a patient or a doctor from a list of patients and doctors, so from this system the details of the patient or doctor can be retrieved in one click.
* To avoid mistakes, many times humans make mistake in calculation so there will unnecessary violence, so using this system payment of doctors can be calculated correctly.
* Easy to retrieve, update and delete the records.
* Using all the related concepts of DBMS.

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**2.2 Database Assumptions**

The assumptions of my project are as follows:

* A Doctor has Doctor Id, Doctor Name, Gender, Age, Designation, Phone Number, and Address.
* A Patient has Patient Id, Doctor Id, Patient Name, Gender, Age, Disease, Phone Number and Address.
* Doctor gets paid through Pay Check which has Check Number, Doctor Id, Salary, Bonus and Pay Date.
* Insurance has Insurance Id, Patient Id, Insurance Name, Category and Address.
* Invoice has Invoice Id, Patient Id, CPT Id, Prescription Id, Diet Id, Fee and Invoice Date.
* CPT has CPT Id and Category.
* Diet has Diet Id, Doctor Id, Patient Id and Diet Plan.
* Prescription has Prescription Id and Medicine Quantity.
* Medicine has Medicine Id, Prescription Id, Medicine Name, Manufacture Date, Price and Expiry Date.
* Payment has Payment Id, Payment Method, Paid Date and Invoice Id.
* Each Department has one or more doctors, each doctor employs to a department and each doctor should belong to one department.
* A doctor can treat many patients and many patients can be treated by many doctors.

Constraints

* Patient should have unique Id; patient details should be stored in a separate file.
* Payment Check must be issued on correct date.
* One patient can be treated by one doctor at a time.

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**CHAPTER 3**

**DATABASE DESIGN**

Database Design is the organization of data according to a database model. The designer determines what data must be stored and how the data elements interrelate. With this information, they can begin to fit the data to the database model.

Database design involves classifying data identifying interrelationships.

A design process involves the following steps:

* Determine the purpose of the database.
* Find and organize the information required.
* Divide the information into tables.
* Turn information items into columns.
* Specify primary keys.
* Set up the table relationships.
* Refine the design.
* Apply the normalization.

ER diagram (Entity-Relationship model)

Entity – An entity is generally a real-world object which has characteristics and holds relationships in a DBMS.

Relationship – When an Entity is related to another Entity, they are said to have a relationship.

Database designs also include ER diagrams. An ER diagram is a diagram that helps to design databases in an efficient way.

Attributes in ER diagrams are usually modeled as an oval with the name of the attribute, linked to the entity or relationship that contains the attribute.

Components of ER Diagram

1. Entity

ENTITY

RELATIONSHIP

1. Relationship
2. Attributes

ENTITY

4. Key Attribute

5. Multivalued Attribute

6. Composite Attribute

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**3.1 BRIEF DESCRIPTION OF RELATIONAL MODEL**

What is Relational Model?

In the relational model, all data is logically structured within relations, i.e., tables. Each relation has a name and is formed from named attributes or columns of data. Each tuple or row holds one value per attribute or columns of data. Each tuple or row holds one value per attribute. The greatest strength of the relational model is this simple logical structure that it forms. Behind this simple structure is a sophisticated theoretical foundational that is lacking in the first generation of DBMSs.

Objectives of Relational Model

The relational model’s objectives were specified as follows:

* To allow a high degree of data independence; application programs must not be affected by alterations to the internal data representation, mostly by chances to file organizations or access paths.
* To provide considerable grounds for dealing with data semantics, reliability, and redundancy problems. In particular, Codd’s theory for the relational model introduced the concept of normalized relations, where relations that have no repeating groups and the process is called normalization.
* To allow the expansion of set-oriented data manipulation languages.

Some Common Relational Model Terms

Table name

STUDENT Column name

|  |  |  |
| --- | --- | --- |
| Roll\_No | Name | Phone |
| 1 | Kaushik | 44123 |
| 2 | Prabha | 421456 |
| 3 | Gayathri | 45678 |

Tuple

Table

Attribute

**3.2 ER DIAGRAM**

INSURANCE

M;N

DOCTOR

1:N

PATIENT

PRESCRIPTION

M:N

MEDICINE

1:1

PAYMENT

CPT

N:1

DIAGNOSIS

PAYCHECK

N:1

N:1

INVOICE

1:N

1:1

Treat Buy

Has Receive

Paid By

Include Include Include

Comprised Of

FIG 1: ER DIAGRAM

**3.3 SCHEMA**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| DID | DNAME | GENDER | AGE | DESIGNATION | PHNO | ADDRESS |

Doc

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| PID | DID | PNAME | GENDER | AGE | DISEASE | PHNO | ADDRESS |

Pat

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| INV\_ID | PID | CPT\_ID | PRE\_ID | D\_ID | FEE | INV\_DATE |

Inv

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| CHK\_NUM | DID | SALARY | BONUS | PAY\_DATE |

Pac

In

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| IN\_ID | IN\_PID | IN\_NAME | CATEGORY | ADDRESS |

Pay

|  |  |  |  |
| --- | --- | --- | --- |
| PAY\_ID | PAY\_METHOD | PAID\_DATE | INV\_ID |

CPT

|  |  |
| --- | --- |
| CPT\_ID | CATEGORY |

Diet

|  |  |  |  |
| --- | --- | --- | --- |
| D\_ID | DID | PID | D\_PLAN |

Medicine

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| M\_ID | PRE\_ID | M\_NAME | MGF\_DATE | PRICE | EXP\_DATE |

Prescription

|  |  |
| --- | --- |
| PRE\_ID | MED\_QUA |

FIG: 2 SCHEMAS

Schema Name

* Doc – Doctor
* Pat – Patient
* Inv – Invoice
* Pac – Paycheck
* In – Insurance
* Pay – Payment
* CPT – CPT
* Diet
* Medicine
* Prescription

**CHAPTER 4**

**IMPLEMENTATION**