Patient Record System

Project Report

Group Members

1.167141-Karogo Joe Ndungu

2.149540-Mbugua Jesse Murathime

Introduction

This report is about a project we did to create a Patient Record System. We wanted to build a better way for hospitals and clinics to keep track of patient information where everything would be digital and easy to find.

Many places, even here in Kenya, still use paper systems. This can lead to lost records, mistakes, and it just takes way too long to find what you need. This can really affect how well patients are cared for.

Our project tries to fix this by creating a digital system. This is actually connected to a really important global goal, Sustainable Development Goal (SDG) 3: Good Health and Well-being. By making information easier to manage, we can help improve healthcare for everyone.

When we started planning what our system would do, we decided to focus on the most important things for keeping track of patients. This means things like:

- **Patient Records:** Keeping track of patient names, where they live, and how to contact them.
- **Appointments:** Setting up and organizing when patients see the doctor.
- **Doctor Information:** Storing information about doctors, like what kind of doctor they are and where they work.
- **Medical Records:** Writing down what's wrong with patients and their health history.
- **Prescriptions:** Keeping track of the medicines that doctors give to patients.

- **Billing:** Dealing with how patients pay for their care.
- **Department Information:** Keeping track of the different parts of the hospital.

Objectives

Our main objectives in developing this system centered around several key improvements for healthcare management. Firstly, we aimed to ensure that patient information would be securely stored and, crucially, easily retrievable when needed. Secondly, a core goal was to significantly reduce the occurrence of errors, particularly in areas where accuracy is paramount, such as in billing processes and the administration of medicine orders. We also sought to create a system that would streamline hospital operations by simplifying the generation of necessary reports. Furthermore, we recognized the importance of facilitating enhanced collaboration and communication between the various departments within the hospital environment. Finally, we designed the system with scalability in mind, intending for it to effectively accommodate the future growth and expansion of the healthcare facility."

Stakeholders

These are the stakeholders within the system:

- **Doctors:** They need to see a patient's history quickly to make the best decisions. Our system helps them do that!
- **Patients:** They want to be seen quickly, get accurate bills, and know their information is safe.
- **Hospital Administrators:** They need to keep track of everything to make sure the hospital is running well.

Drawing the ERD

To start designing our system, we created an Entity-Relationship Diagram (ERD). It's like a blueprint that shows all the different pieces of information and how they're connected. We used draw.io to make it.

Key Entities and Attributes

- **Patient:** Patient ID, Name, Date of Birth, Gender, and Phone Numbers.
- **Doctor:** Doctor ID, Name, and Speciality.
- **Department:** Department ID, Name, and Location.
- **Appointment:** Appointment ID and date of the appointment.
- **Medical Record:** Record ID, and Diagnosis.
- **Prescription:** Prescription ID, and Medication Name.
- **Billing:** We tracked Bill ID, and Amount owed.

Relationships

We defined how these things are related. For example:

- One Patient can have many Phone Numbers.
- One Patient can have many Appointments.
- One Doctor can see many Patients.
- An Appointment is always between one Patient and one Doctor.

Database Schema

Next, we took our ERD and turned it into a database schema. We wanted to make sure it was organized well to avoid problems like having to enter the same information over and over again basically normalization.

Tables and Fields

We organized the database into tables. Each table stores information about one type of thing:

- **Patient:** Stores patient information.
- **Doctor:** Stores doctor information.
- **Department:** Stores department information.

- **Appointment:** Stores appointment information.
- **Medical Record:** Stores medical record information.
- **Prescription:** Stores prescription information.
- **Billing:** Stores billing information.
- **Patient Phone:** Stores patient phone numbers.

Each table has "fields" (columns) to store specific pieces of information. For example, the "Patient" table has fields for "PatientID," "Name," "DOB," and "Gender."

6.2. Normalization

- **1st Normal Form:** We made sure each piece of information was in its own "cell." For example, instead of putting all of a patient's phone numbers in one cell, we put them in a separate table.
- **2nd Normal Form:** We made sure each table was about *one* thing. For example, the "Doctor" table is only about doctors.
- **3rd Normal Form:** We made sure we didn't store the same information in multiple places. For example, we store the doctor's department in the "Doctor" table, not in the "Appointment" table.

Foreign Keys

To connect our tables, we used "foreign keys." These are like links between tables. For example, the "Appointment" table has a "PatientID" that links it to the correct patient in the "Patient" table.

SQL Implementation

We implemented our tables with SQL.

Database and Table Creation

We used SQL to create the tables we designed, telling the database what information to store in each one.

Data Insertion

We also used SQL to add some sample data to our tables, so we had something to work with.

Data Manipulation

We used SQL to do some basic things:

- **Get information:** We could ask the database to show us information, like all the patients or all the appointments for one patient.
- **Change information:** We could update information, like changing a doctor's specialty.
- **Delete information:** We could remove information, like deleting a prescription.

Advanced Queries

We also used SQL to:

- **Combine information:** We could combine information from different tables, like getting a list of appointments with the patient's name and the doctor's name.
- **Calculate things:** We could calculate things like the total amount each patient owes.
- **Find specific information:** We could find patients who meet certain criteria, like all patients who saw a dermatologist.

Group Contribution

Originally, we were three members but one member pulled out because he injured his leg so his semester ended there leaving us at two. We divided work equally. One handled the random data and the queries and the other handled table creation. The report and ERD was worked by both of us.

Conclusion

In conclusion, our Patient Record System offers a significant improvement over paper system. By digitizing and organizing patient information, it makes work easier reduces errors, and ultimately supports better patient care.

Github repository: https://github.com/jnk1h/patient-record-system