Project Proposal

Team Name: NicholasNNeemaKHolmesS
Team Members: Natasha Nicholas, Khushi Neema, Shane Holmes

Top Level Description

Pharmacy management systems often lack advanced features that integrate medical and chemical data for improved patient care and medication management. Our goal is to develop a pharmacy management system that tracks medications and incorporates essential chemical information, including the molecular structure, safety guidelines, and side effects. The system will allow pharmacies to manage patient data, and prescriptions, and track medications by their chemical classification (organic or inorganic) and type (tablet, syrup, etc.).

This system will allow doctors to prescribe medications by accessing information about the illness it treats, its scientific and layman's terms, dosages, side effects, and the purpose of the medication. Customers can retrieve information about their prescriptions, such as the expiration date, dosage, and potential hazards. The system will also include a chemical component database, which contains detailed information on the molecular formula and structure of the medication, helping both doctors and pharmacists ensure the safe and effective distribution of medications.

Top Level Data to be Stored

Pharmacist

> This entity will contain the information of employees working at a pharmacy store. Name, contact details as well as the certification are the necessary details to identify a pharmacist.
>
> A pharmacist works at only 1 pharmacy store.
>
> A pharmacist can have 1 to many certifications.

Pharmacy Store

> This entity will contain the pharmacy store’s name, address, and phone number.
>
> A pharmacy store can employ 1 to many pharmacists.

A pharmacy store can have 0 to many insurance in the network.

A pharmacy store sells 0 to many medications.

Order

This entity describes an order of medication, along with the quantity of medication, delivery data of the medication and the order_id.

An order can be placed by only one doctor.

An order can contain 1 to many medications.

An order can be picked up by a customer at a pharmacy.

Medication

This entity will contain the medication's scientific name, common name, brand name, dosage, type, expiration date, warnings, contact information for the manufacturer, and ingredients.

A medication can be sold by 0 to many pharmacy stores.

A medication can be covered by 0 to many insurance companies.

A medication can be contained in 1 to many orders.

A medication has 1 to many uses.

A medication is composed of 1 to many chemicals.

A medication can be prescribed by 0 to many doctors.

Insurance

This entity stores the information about the health insurance of an individual and checks if it is network with the pharmacy store.

An insurance company is in the network of 1 to many pharmacy stores.

An insurance company covers 0 to many medications.

An insurance company insures 1 to many customers.

Use

This indicates the uses for a medication, and what body part it affects.

A use can be for 1 to many medications.

Chemical

This entity will contain a chemical's scientific name, common name (if it has one), molecular formula, structure, overall charge, and solubility.

A chemical can contain 0 to many hazards.

A chemical can have 0 to many classifications.

A chemical can compose 0 to many medications.

Classification

The classification refers to the classification of a chemical (eg: acids, bases, etc. for inorganic chemicals; nitriles, amines, etc. for organic chemicals. This entity will contain the name of a class and any properties that this class contains.

A classification can classify 0 to many chemicals.

Hazard

The hazards refer to any physical hazards that a chemical may have, such as flammability or irritation. This entity will contain a description of the hazard as well as any safety precautions an individual must take when handling these chemicals.

A hazard can belong to 1 to many chemicals.

Doctor

This entity represents the doctor, it contains the full name, office name, office address, email, and their specialty.

A doctor can have 1 to many certifications.

A doctor diagnoses 1 to many customers with illness'.

A doctor creates 0 to many orders.

A doctor prescribes 0 to many medications.

Customer

This entity represents a customer, it contains the customers insurance id, full name, address, date of birth, email, and phone number.

A customer can be diagnosed by a doctor with a specific illness.

A customer can pick up an order at a pharmacy.

A customer is insured by 1 insurance company.

Illness

This entity represents an illness, it includes the name of the illness, its severity, its symptoms, and the type of the illness i.e. is it mental or physical.

An illness can be diagnosed by a doctor for a particular customer.

Certification

It will contain the details about the certificates that a doctor/ pharmacist can hold. It will have the credentials, name and the institution where the certification was made.

A certification can be given to 0 to many pharmacists (ex: a pharmacist may not receive an MD).

A certification can be had by 0 to many doctors.

A certification can be had by 0 to many pharmacists.

SQL and Software

This problem can be solved by using a relational database (SQL) through MySQL workbench. Our database will have 12 tables each containing necessary information about medical/pharmacy. To make this database more interactive, we plan to integrate a front-end application made from Python integrating Flask/Streamlit framework as our interface. This integration will help to provide a user-friendly interface for managing and accessing the database, allowing doctors, pharmacists, and customers to easily retrieve and update information on medications,

prescriptions, and patient data in real time while ensuring smooth communication between the front-end application and the underlying SQL database for efficient pharmacy management.

Domain Interest

Our group is passionate about both chemistry and creating user-friendly systems. Natasha, with her strong inclination towards chemistry, recognized the importance of integrating molecular chemistry into pharmacy, enhancing the precision and safety of medical treatments. Meanwhile, Shane and Khushi wanted to focus on building a customer-facing system, ensuring that the pharmacy management system not only serves as a robust backend for medical data but also provides an interactive, user-friendly interface for doctors, pharmacists, and customers to easily access and manage essential information.

User Interaction

The user in this scenario is the pharmacist. The pharmacist will log in with their credentials and be able to see any orders that have been placed to the pharmacy they work at. When they click on the order, they will be able to see the customer it's for, the customer's doctor who prescribed the medication, the customer's insurance information, the customer's illness, and the medication that has been prescribed. The pharmacist can click on the doctor's name to view the various certifications they may have. When the pharmacist clicks on the medication itself, they will be able to see various features such as the medication's uses and the chemicals that the medication is composed of. When the pharmacist goes to view each chemical specifically, they will be able to see the chemical's classification which signifies the type of chemical it is in addition to any hazards the chemical may have.