



Online Pharmacy: Medicine Delivery System

PharmVille

CS353

Project Proposal

Group 9

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1. Introduction

PharmVille is a web application for medicine delivery where all work for different users can be handled through one dynamic website. Pharmacists can register medicines to their pharmacies, doctors can prescribe medications to patients, and patients can effectively purchase their medicine accordingly. PharmVille has quality-of-life features that will help all users handle the medicine delivery system easily. Medicines have specifications such as dosages for age groups and side effects. There are different types of prescriptions for different drugs. Search filters can be used to minimize time-consuming activities. System reports can be created to keep track of sales. Payment is done through the PharmVille online wallet, making everything manageable from the website.

2. Description of the System

PharmVille will have four types of users: Patient, Doctor, Pharmacist, and Admin. Admin users will be responsible for accepting new pharmacists, new doctors, and new products into the system and maintaining the application. A Doctor will be able to prescribe medicine to Patients. A Doctor can also view their Patient's prescription history in case they want to prescribe a new medicine accordingly. The system will display a warning to the Doctor when they try to prescribe a medicine that is not suitable for the specific Patient's conditions. However, the Doctor can override the warning and prescribe the medicine. There will be one Pharmacist account per each registered pharmacy. Pharmacists can view their inventory through the system. They can also add more of previously approved products to their stocks or request approval for new products that they want to start selling through the application. Pharmacists can generate a report of sales occurring within a time-frame. Lastly, Patients will be able to view their prescription history along with their active prescriptions. They will load credits to their online wallet to purchase products. The system will automatically show them the nearby pharmacies which have the prescribed medicines when they click on their active prescriptions. Patients can also use the integrated map to search for the location of specific pharmacies. Doctor and Pharmacist account owners will have separate Patient accounts to buy products through the application.

3. Why and How a Database Will be Used

Our patient tracking system has been designed to store and manage patients' pharmaceutical information efficiently. In order to provide efficiency in managing this information, persistent data storage is needed. This allows us to ensure that the information we collect is securely stored and can be retrieved whenever required. Our system is designed to provide the functionality of viewing previously registered information and to achieve this, we must store this information in a database.

The information we store includes a range of attributes such as a patient's current and previous prescriptions, the patient's personal information including age, weight, and address, the patient's wallet funds, pharmacy's stock levels of drugs, and their prices and schedule of pharmacies on duty. Since our data is by its nature has a relational structure, we deemed it

appropriate to use a relational database system for our data persistence. The use of this system enables us to ensure that data is organized and easily searchable, making it easier for healthcare professionals to access relevant patient information quickly. Additionally, this system can ensure that the data is stored and served to patients within an acceptable amount of time, providing a better user experience overall.

Each PharmVille entity will be stored in its own table in the relational database. These tables will be joined together using foreign keys and join tables. Interaction with this database will be done by Structured Query Language (SQL).

4. Functional Requirements

4.1 Interactions of the Patient Role:

- Patients can view their prescriptions and their status (active, expired, used)
- Patients can add funds to their wallets
- Patients can update or enter their address, contact, chronic diseases, and personal information in their profile
- Patients can enter their age, weight, etc., to purchase drugs with some restrictions based on the patient's information [1]
- Patients can search for drugs and pharmacies and view them
- Patients can add drugs (or products) that do not need a prescription to their shopping cart and can add drugs that need a prescription by selecting an active prescription to add to the shopping cart process
- Patients can view and edit their shopping cart (remove items or increase the amount)
- Patients can pay for the items in their shopping cart by selecting if they want a shipping order or pick-up order which leads to a balance reduction
- Patients can view the schedule of pharmacies on duty

4.2 Interactions of the Doctor Role:

- Doctors can write prescriptions with a given patient's national id by selecting the prescription type (normal, red, orange, purple, green) [2] and drugs
- Doctors can diagnose diseases and state them for the patients to see
- Doctors can view previous prescriptions of a patient

4.3 Interactions of the Pharmacy Role

- Pharmacies can select a drug from the database to sell and enter the drug's price and stock information
- Pharmacies can view active deliveries with delivery numbers
- Pharmacies can create system reports by entering their specifications (For instance, amounts of drugs sold within a time frame)
- Pharmacies can add to the system external products that are not drugs (For instance, lip balm, hand cream, etc.) by adding an image, title, and product description

- Pharmacies can enter their schedule for when they will be on duty in the system

4.4 Interactions of the Admin Role

- Admins can register new drugs to the systems by specifying the details (e.g., what it is used for, side effects, is prescription needed, is suitable for any age group, etc.)
- Admins have the permission to remove any product and can remove it if necessary
- Admins can approve or deny a new pharmacy or doctor role request (by viewing their diploma)

5. Nonfunctional Requirements

5.1 Low Response Time

PharmVille has a balance reduction system. Also, users should be able to view or search for products by waiting a short amount of time. Hence, the system must have a low response time. So, PharmVille will provide visual effects on the front end to make the user feel like the wait times are less than they are. Also, the system should handle user requests from Ankara in, at most, half a second.

5.2 Reliability

PharmVille will work with important user data, such as prescription information. The integrity of the said data is important. Hence the database will be regularly backed up to prevent data loss from data corruption and physical factors. The system should not lose any data at failure.

5.3 Intuitiveness

PharmVille will be used by doctors, pharmacies, and patients from all over the country that have different technical knowledge. Hence, the user experience of the system will be well thought out. The UX will be tested for misuse and designed as intuitively as possible. Tests will be conducted on the target demographic (doctors, patients, pharmacists) and should have at least 90% approval rate across the board.

5.4 Security

PharmVille contains sensitive data that should be stored securely, such as national id, personal information of patients, payment information, pharmacy logs, etc. Hence, the system should be protected against malicious attacks and avoid unauthorized information disclosure. To prevent unauthorized pharmacies and doctors from registering to the system and to make it secure, doctors and pharmacies must upload their diplomas to the system and wait for admins' approval.

6. Limitations

- Only the application administrators can add new medicines to the system before the pharmacists will be able to sell them.
- Only doctors have control over prescriptions and medications that a patient can enable restricted medicine purchase.
- Doctors can see every patient's prescription and add prescriptions to all users using their TCK.
- All medicine sale data is controlled at one point
- Users must log in to use the application.
- Payment can only be done through the PharmVille online wallet.
- Only patients can create an account without permission. Doctors and pharmacists must apply for an account.

7. ER Diagram

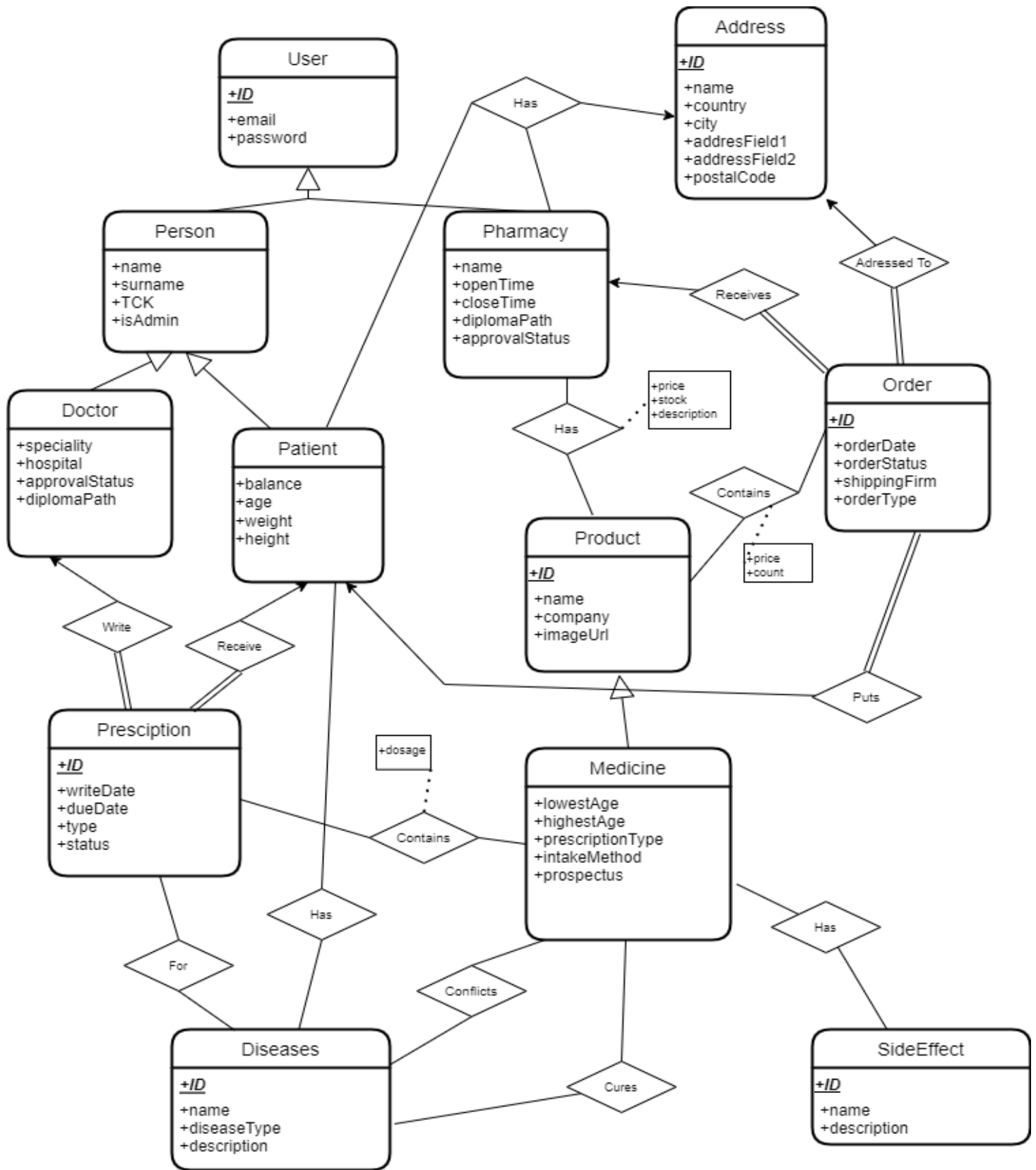


Table 1: PharmVille ER Diagram

8. Conclusion

PharmVille is an online pharmacy, in other words, a medicine delivery system. The system will allow patients to order medicines from the system. Doctors will enter diseases and prescriptions into the system and can view patients' previous prescriptions. Pharmacies will sell medicine by adding stock and price knowledge to the system. The benefit of this website is that patients can make purchases without leaving home, pharmacies can view purchase logs and track orders, and doctors can easily view patients' previous prescriptions. The database of PharmVille will ensure efficient and reliable data storage. In other words, PharmVille is a website to manage medicine delivery online.

9. References

- [1] "Uzmanların Cevabını Aradığı Soru: çocuklarda Antidepresan Kullanılır mı?," *Independent Türkçe*. [Online]. Available: <https://www.indyturk.com/node/495091/sa%C4%9Flik/>. [Accessed: 02-Mar-2023].
- [2] "Reçete çeşitleri Nelerdir? Tüm Renkli Reçete çeşitleri," *Tıp Fakültesi Rehberi*, 17-Dec-2019. [Online]. Available: <https://blog.doktorbun.com/recete-cesitleri-nelerdir/>. [Accessed: 02-Mar-2023].