SOFTWARE REQUIREMENTS SPECIFICATION

for

Med-Ex

Version 0.4

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0.1 Revision History

Name	Date	Reason for Changes	Version
Team Med-Ex	July 8, 2021	Began initial release.	0.1
Team Med-Ex	July 15, 2021	Finished initial release.	0.2
Team Med-Ex	July 16, 2021	Added appendices and diagrams.	0.3
Team Med-Ex	July 17, 2021	Minor changes.	0.4

0.2 Sign-Offs

We agree that this document represents our best understanding of the requirements for this project today and the system described will satisfy our needs. We agree to make future changes in this baseline through the project's defined change process. We realize that approved changes might require us to negotiate the cost, resources, and schedule commitments for this project.

Name	Title	Signature	Date
Avishek Lahiri	Member, Team Med-Ex		July 17, 2021
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1 Introduction

1.1 Purpose

This SRS describes the software functional and nonfunctional requirements for Med-Ex. Med-Ex will permit a pharmacy wholesaler (the administrator of the system) to keep track of their transactions with retailers and distributors, and vice-versa.

1.2 Document Conventions

No document conventions are being used at this time.

1.3 Intended Audience and Reading Suggestions

This document is intended to be used by members of the project team that will implement and verify the correct functioning of the system.

1.4 Project Scope

Med-Ex is a desktop client that connects the wholesaler and a number of retailers and distributors to an online pharmacy database, thereby allowing the users to keep track of their transactions through an intuitive, easy-to-use interface.

2 Overall Description

2.1 Product Perspective

Med-Ex is a desktop client that connects users to a centralized web server and facilitates all transactions between the wholesaler (who is also the administrator of the system) and their customers. The main goal is to provide a system that smooths the transaction procedure, both credit-based and cash-based.

2.2 User Classes and Characteristics

Med-Ex has two types of users.

- Admin (Wholesaler)
- Non-Admin
  - Retailer
  - Distributor

The wholesaler is the admin of the system and has super user privileges. The non-admin users may either be retailers or distributors, who are in a professional relationship with the wholesaler.

2.3 Product Functions

Med-Ex operates for two types of users - admin and non-admin. At first, the login screen prompts the user to either sign up for a new account or sign in to an existing account. Only one admin account can exist in the system.

All users have as login parameter a user ID, a password (with a suitable encryption method). There is also a record for individual transactions.

Unique to the admin are a working balance (which is utilized for purchase and stocking of pharmaceutical inventory), whereas unique to the non-admin users are security deposit and credit balance (for the purpose of credit-based transactions), a credit flexibility rate and an associated credit score.

Each user has a mechanism for changing their password, viewing their website history (inclusive of transaction records and credit limit exhaustion warnings), as well as logging out of the system.

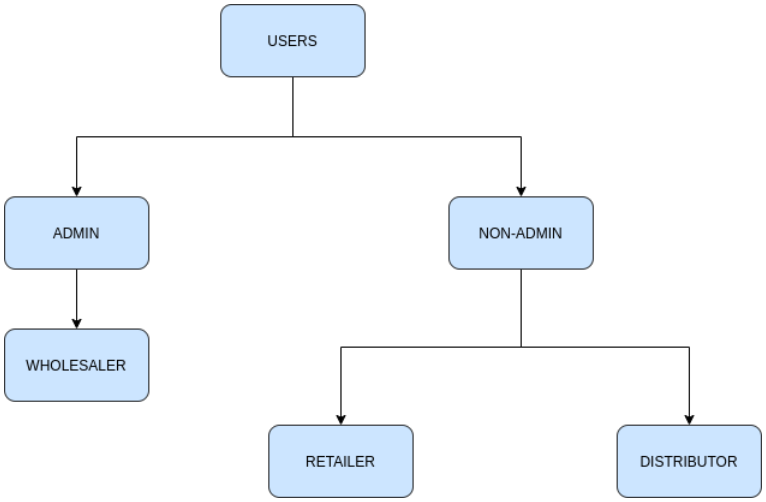

Figure 2.1: Types of Users

2.4 Operating Environment

The website server will be online and the desktop client will connect to the server from any of the three operating environments Macintosh, Windows NT and Linux. There will also be an associated Android and iOS app.

2.5 Design

The main features available to the wholesaler (admin) have been listed here.

- Viewing and adding balance to his account.
- Viewing the medicine inventory list and adding items to it.
- Viewing the status details of all retailers/distributors.
- Viewing notifications and updating the credit flexibility of retailers/distributors.

The main features available to the non-admin users (retailers and distributors) follow.

- Adding credit balance to their account.
- Viewing the medicine inventory list and purchasing items from it.
- Viewing their status details.

3 System Features

Med-Ex is a pharmacy software made on the basis of the demands of the wholesaler, while also keeping in mind the requirements and the functionalities of the retailers/distributors.

3.1 Description and Priority

The main features common to all the users have been listed here:

1. **Sign Up/Sign In**: The user is able to create their account as a wholesaler or retailer/distributor. If the user's account already exists, then they are able to sign in to their account. Suitable checks are provided for special cases such as the user entering a wrong password. For the first account that is created, the user is asked whether he/she is the wholesaler and the account is created likewise.
2. **History**: A list of all the transactions made by the user since account creation is retrieved and displayed to the user.
3. **Change Password**: The user may change the password to his/her own choice with the help of this function.
4. **Log Out**: It logs out from the account of the user.

The main features unique to the wholesaler have been listed here:

1. **View Balance**: The balance of the user is retrieved and displayed based on the user account.
2. **Add Balance**: The user is given an option to add balance to the present balance in their account.
3. **Inventory List**: A list of the medical supplies presently available with the wholesaler is displayed. The wholesaler may add items to this list as and when new supplies arrive. The retailer/distributor may buy from the medical supplies present on this list.
4. **User Details**: It shows the details of all the non-admin users who have signed up for the Med-Ex software.
5. **Notifications**: It shows the notifications for the wholesaler, and gives them the option to alter the credit flexibility of retailers/distributors.

The main features unique to the retailers/distributors have been listed here:

1. **View Status**: The status of the respective user is retrieved and displayed, which includes their security deposit, credit amount, score and flexibility along with the user ID and status.
2. **Add Credit**: The retailer/distributor may add to their credit amount using this function.
3. **Buy**: This function allows the retailer/distributor to buy medical supplies from the current inventory.

3.2 Required Databases

Med-Ex will make use of the following databases (hosted on a cloud server) for its smooth functioning:

1. **Account Database**: This will contain the basic details of the users such as user ID, login password (in an encrypted format), status (whether wholesaler, retailer or distributor), security deposit, credit balance details (based on a scoring system elaborated later on) and the number of transactions, wherever applicable. Any function to log into an account or view/edit the aforesaid criteria will require access to the account database.
2. **Inventory Database**: This will contain the basic details of the medical supply as available with the wholesaler such as medicine name, price per unit and stock available with the wholesaler at present. The functions for the wholesaler to add to inventory and for the retailers/distributors to buy will require access to the inventory database.
3. **Transactions Database**: This will contain a record for the transactions (modification of balance/credit, purchase of medicine to and from inventory, changes to account such as password change) for wholesaler, retailers or distributors, whomever applicable. This will also contain a record of all the alterations in credit flexibilities of non-admin users as made by the admin (wholesaler).
4. **Warnings Database**: This will contain a record for the retailers and distributors having exhausted their credit flexibility. The functions for the wholesaler to view (and consequently clear) warning messages, and the retailers/distributors having exhausted their credit limit while credit-based purchase will require access to the warnings database. For further details on warnings database, please refer to the credit flexibility scoring system.

3.3 Stimulus/Response Sequences

- **Stimulus**: User requests to sign in/sign up.
  Response: System logs into the account or creates a new account and then logs into the account and displays the functionalities based on the user.

- **Stimulus**: User requests to view history.
  Response: System retrieves and displays a history of all transactions made by the user.

- **Stimulus**: User requests to change password of their account.
  Response: System changes the password stored with it with the new password provided by the user.

- **Stimulus**: User requests to log out.
  Response: System logs out from the account of the user and provides the sign up/sign in option for a new user.

- **Stimulus**: Admin requests to view balance.
  Response: Systems retrieves the admin's balance and displays it.

- **Stimulus**: Admin requests to add to the admin's balance.
  Response: System adds to the remaining balance in the admin account.

- **Stimulus**: Admin requests to view the inventory list.
  Response: System retrieves the medical supplies that are currently available with the admin at the presently.

- **Stimulus**: Admin requests to view the user's details.
  Response: System retrieves and displays all the non-admin users' details to the admin.

- **Stimulus**: Admin requests to view the notifications.
  Response: System retrieves and shows the notifications for the wholesaler, and gives them the option to alter the credit flexibility of retailers/distributors.

- **Stimulus**: A non-admin user requests to view their status.
  Response: System retrieves and displays the account's security deposit, credit amount, score and flexibility along with the user ID and status.

- **Stimulus**: A non-admin user requests to add credit to their existing credit.
  Response: System adds the said amount to the remaining credit in the non-admin user's account.

- **Stimulus**: A non-admin user request to buy medical supplies from the wholesaler.
  Response: System allows the non-admin user account to buy medical supplies from the current list of available supplies and based on their available balance.

3.4 Credit Flexibility Scoring System

Med-Ex will implement credit-based payments by means of security deposit. When a non-admin user creates an account, they are asked to add some credit, a fraction of which is stored as a security deposit.

The security deposit will be maintained using a parameter named flexibility. The default flexibility will be set to 0.5, implying that the user is allowed to buy using 50% of their initial credit, and the remaining 50% is set aside as the security deposit. Likewise, if flexibility is 0.6, the user will be allowed to buy using 60% of their initial credit, and the remaining 40% will be set aside as the security deposit.

This can be mathematically expressed as

$$SEC = CRD * (1 - FLEX)$$

where SEC is the security deposit, CRD is the credit and FLEX is the credit flexibility. Higher the flexibility, greater the amount user can spend out of credit balance. If the user adds credit, the initial credit will be updated, and accordingly, the security deposit.

Whenever a non-admin user exhausts his credit limit, a warning will be generated to the user a copy of which will be sent as a notification to the admin. Then the admin will be prompted, based on the notification, to alter the credit flexibility of the former.

Whenever a non-admin user successfully completes a transaction (by cash or credit payment) a point is added to their score, and whenever they terminate a transaction midway, a point is deducted. This score will help the admin keep track of their reliability and take this into consideration when prompted to alter their credit flexibility.

3.5 Functional Requirements

Med-Ex is to be built as a command line interface using Python 3.8 or higher, and certain packages will be used. These prerequisites will be installed automatically (and configured as per the system specifications) during the setup of the software. Pandas is to be used to build the web interface. A cloud server is required to store, edit and retrieve from the software database.

4 External Interface Requirements

4.1 User Interfaces

- **UI-1**: The application prototype shall permit complete navigation for all kinds of users using the keyboard alone, since it is a Command Line Interface application.
- **UI-2**: The software may be extended for web-based or mobile-based applications of the same model where keyboard, mouse or a virtual keyboard may be used for the respective applications.

4.2 Hardware Interfaces

No hardware interfaces have been identified.

4.3 Software Interfaces

- **SI-1**: The system shall communicate with a database through a programmatic interface for the following operations:
  - To store real-time user data.
  - To store list of medical supplies.
  - To calculate the score for non-admin users.
  - To display notifications to the admin.
  - To display non-admin user details to the admin.
  - To display present status of their accounts to non-admin users.

4.4 Communications Interfaces

- **CI-1**: The system shall send a notification to the admin user to inform them of the current developments and give them the option to alter the credit flexibility of retailers/distributors.
- **CI-2**: The system shall provide the users with a history of their transactions as and when requested by the user.
- **CI-3**: The system shall provide non-admin users with the present status of their account as and when requested by them.

5 Other Nonfunctional Requirements

5.1 Performance Requirements

A stable, working internet connection is essential for the running of Med-Ex.

5.2 Safety Requirements

No safety requirements have been identified.

5.3 Security Requirements

None other than registered users can access the website. Each user can only perform the functions as assigned to their account according to their status level (admin or otherwise). Each account will have an associated password encrypted using random seeding, and suitable protocols for password management.

5.4 Software Quality Attributes

To ensure that the quality of the software is maintained and all standardization requirements are fulfilled, stakeholder conferences shall continue all the way up to the development and testing phases. Logical and user interface tests are also required to be undertaken for that purpose.

5.5 Other Requirements

Med-Ex needs regular maintenance as it is a web-based real-time software. It will need refactoring and the requirements can be changed further as and when new issues arise.

6 Appendix

6.1 Data Flow Diagram

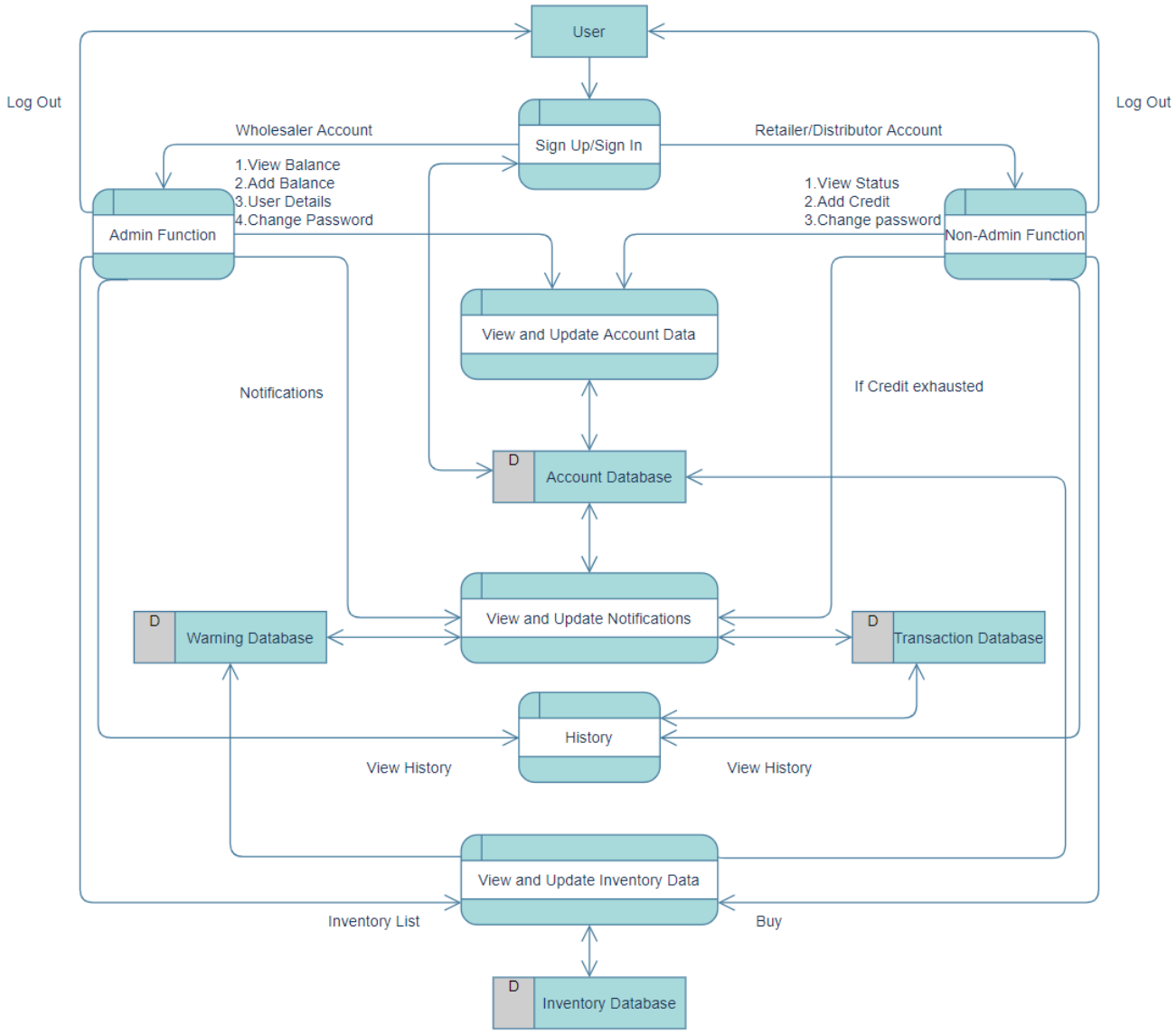

Figure 6.1: Data Flow Diagram