Software Requirements Specification Document (IEEE FORMAT)

Version 1.0

Medex
System for Streamlining Contactless Operations of Medical Services

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1 INTRODUCTION

1.1 Purpose of this Document

The purpose of this SRS document is to provide a detailed overview of our software product, its parameters and goals. This document describes the project's target audience, user interface, and hardware and software requirements. It defines how our client, team and audience see the product and its functionality.

1.2 Scope of the Development Project

The goal is to design a System for Streamlining Contactless Medical Operations for MSMEs aimed explicitly at the medical industry. The system will provide access to three users, the doctor ,the patient and pharmacist. Doctors can add, modify and delete our medical history. The Pharmacist can see the prescription and the patient can book an appointment, see the prescription and the medical records . All this data will be stored in a cloud repository so that the data can be accessed from any location.

The software must be able to perform the following operations:

1. **Identify and authenticate the user:** It must be able to authenticate the user by matching the login ID and password against the database's values and redirecting the user to the correct webpage.
2. **Add, modify and delete medical History:** It must be able to add, modify and delete orders in the database and show the changes in real time.
3. **Take input from QR scanner:** It must be able to take input from a QR scanner so that the user can check in or buy medicines instantly by scanning the QR.

Initially, we plan to implement these functionalities for a single hospital as part of the Pilot Phase. Once the Pilot is successful, we plan to implement it in various hospitals and chemist shops and eventually integrate it with the payment system and NFC based cards.

The scope of this system is not just limited to the medical industry as the exact mechanism can be modified and reused in other industries, small and large. This system can also be developed to provide a complete solution for the finance or academic industry by providing a check in and authentication system.

1.3 Definitions, Abbreviations and Acronyms

Definitions

Table 1 explains this SRS document's most commonly used terms.

Table 1: Definitions for most commonly used terms

S. No.	Term	Definition
1	QR Code[1]	Quick Response Code is a type of two dimensional (2D) bar code that is used to provide easy access to online information
2	QR Scanner [2]	A device specialized for reading QR codes and converting them into digital data.
3	Cloud [3]	A global network of servers, each with a unique function.
4	Database [4]	An organized collection of structured information, or data, typically stored electronically in a computer system.

Abbreviations

Table 2 gives the full form of this SRS document's most frequently used mnemonics.

Table 2: Full form for most frequently used mnemonics

S. No.	Mnemonic	Full Form
1	SSCOMS	System for Streamlining Contactless Medical Operations
2	MSME	Micro, Small, Medium Size Enterprises
3	PC	Personal Computer
4	SRS	Software Requirements Specifications

1.4 References

[1] "Britannica," [Online]. Available: https://www.britannica.com/technology/barcode.

[2] "PC Mag," [Online]. Available: https://www.pcmag.com/encyclopedia/term/barcode-scanner.

[3] "Microsoft," [Online]. Available: https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-the-cloud/.

[4] "Oracle," [Online]. Available: https://www.oracle.com/in/database/what-is-database/.

[5] "Investopedia," [Online]. Available: https://www.investopedia.com/terms/s/supplychain.asp.

1.5 Overview

The remaining sections of this document provide a general description, including the characteristics of the users of this project, the product's hardware, and the functional and data requirements of the product. A general description of the project is discussed in section 2 of this document. Section 2 gives the functional requirements, data requirements, constraints, and assumptions made while designing the SSCOMS. It also provides the user's viewpoint of the product use. Section 3 gives the specific requirements of the product. Section 3.0 also discusses the external interface requirements and provides a detailed description of functional requirements.

2 Overall Description

2.1 Product Perspective

The product will run as a mobile app on a smartphone which will take input through an on screen keyboard or a QR code scanner to retrieve information.

Figure 1 shows the layout of the whole setup required for SSCOMS.

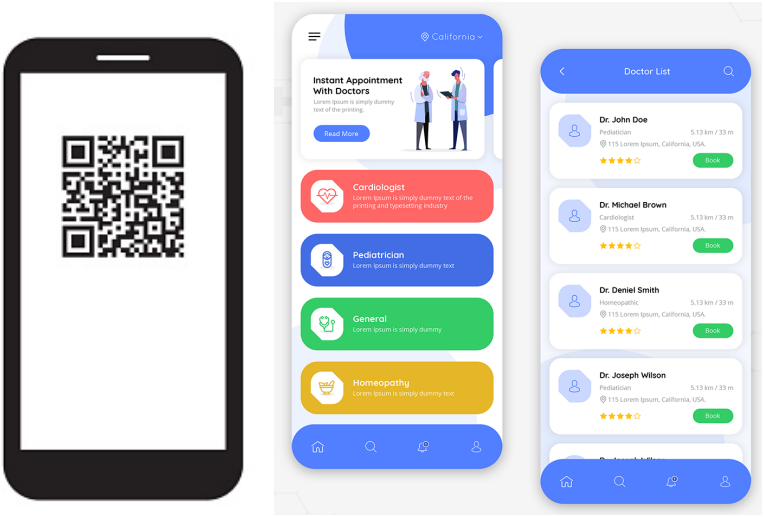

Figure 1: A complete set-up of SSCOMS

Here the user will have to log in using his credentials. Once the user is logged in, they will be taken to the dashboard. Next, the user can choose to scan or lend their QR for scanning. If the user decides to make changes to the order, he will be taken to another page where he can add, modify and delete medical history using the keyboard. If he chooses to make an appointment, he will be taken to another page where he can scan another QR to check in.

In addition, the user can assign an order to a particular inventory and complete the order.

Here the SSCOMS, has four major modules:

1. Check in Module
2. Medical History Module
3. Prescription Module
4. Medicines Module

Upon logging in, the user will be taken to the Dashboard, where he can see the Medical History, remaining Medicines displayed by the *Dashboard Module.* This pending/complete prescription and remaining data are sent to the *Central Database Server* . On the same page, the user will have an option to view their prescriptions and past medical records.

On choosing medical history, the user (Patient and Doctor) will be able to look at the medical history of the patient. The patient will also be able to add his/her medical history incase it is missing. If the user makes any changes in the Medical History page, the same will be communicated and updated in the *Central Database Server*.

On choosing Prescription, the user will see a prescription page. The patient and chemist can view the prescription while the doctor can add/modify the prescriptions on the prescription page. This can be done through either keyboard*,* which sends the data to the prescription page. If any changes are made, the same will be communicated and updated in the *Central Database Server*.

When an order needs to be completed, the order details and the inventory details are fetched from *Prescription and dashboard respectively* which assigns the inventory to the order and marks it complete. The same is updated in the *Central Database Server*.

2.2 Product Functions

The product should be able to perform the following operations:

1. It must be able to authenticate the user and direct them to the correct webpage.
2. It must have the ability to add, modify and delete prescriptions.
3. It must have the ability to add, modify and delete users.
4. It must support data entry using a QR scanner.
5. It must be able to make real-time changes in the database so that the data is not lost in case of any unwanted external behaviour.
6. It must show the medical history and prescribed medicines on the dashboard.
7. It must be able to match medicines with appropriate chemists.

2.3 User Characteristics

The goal is to design a system for Streamlining Operations in Medical Services aimed explicitly at the Medical industry for different users. These user types are listed below as follows:

1. Doctor

2. Patient
3. Chemist

As one can see from the list, the users can have different educational backgrounds and expertise levels in using the system. Our goal is to develop software that should be easy to use for all types of users. Thus while designing the software, one can assume that each user type has the following characteristics:

- The user is computer-literate and has little or no difficulty using an application and using a QR scanner.
- To use a QR, a user is not required to be aware of the internal working of a QR Scanner, but they are expected to know what happens when the scanner reads a QR Code.

2.4 General Constraints, Assumptions and Dependencies

The following list presents the constraints, assumptions, dependencies or guidelines that are imposed upon the implementation of the SSCOMS:

- The product must have a user-friendly interface that is simple enough for all users to understand.
- The response time for loading the software on the browser should be less than five seconds under good network connectivity.
- Response time for a single data entry should not be longer than one second under good network conditions.
- Knowledge of basic computer skills and basic working of a barcode scanner is required to use the product.
- The central database should be updated in real time so that no work is lost in case of any unwanted external situation.
- The product should be able to take input from a barcode scanner.

2.5 Apportioning of Requirements

The SSCOMS is to be implemented in the following three phases:

1. **Pilot Phase:** The SSCOMS will be implemented in a single garment manufacturing unit. The access privileges will be provided to two users, the warehouse manager and the sales manager.
2. **Industry-Wide Deployment:** Following the successful completion of the pilot phase, we plan to take our product public and offer it to all interested manufacturing units.
3. **Introduction of New Features:** After getting a good response, we plan to integrate the billing system (order and e-way bills) into our software with the help of a Tally add-on.
4. **Tracking System and Digitisation:** In this phase, we plan to introduce a shipment tracking system and digitise the complete supply chain.

With each phase, new functionalities would be added to the software; the implementation would take place on a larger scale with each phase.

3 Specific Requirements

3.1 External Interface Requirements

The following list presents the external interface requirements:

- The product requires significant graphics usage with the ability to take keyboard and barcode scanner user input.
- The product does not require the usage of sound, but some animation is needed.

3.2 Detailed Description of Functional Requirements

Table 3 shows a template used to describe functional requirements for two types of users: sales manager and warehouse manager.

Table 3: Template for describing functional requirements

Purpose	A description of the functional requirements and their reasons.
Inputs	What are the inputs; in what form will they arrive; from what sources can the inputs come; what are the legal domains of each input.
Processing	Describes the outcome rather than the implementation; includes any validity checks on the data, exact timing of operation (if needed), and how to handle unexpected or abnormal situations.
Outputs	The form, shape, destination and volume of output; output timing; range of parameters in the output; unit of measure of the output; process by which output is stored or destroyed; process for handling error message produces as output.

3.2.1 Functional Requirements for Log-in Screen

Table 4 gives the functional requirements for Log-in Screen.

Table 4: Functional requirements for Log-in Screen

Purpose	This screen authenticates the user and redirects him to the appropriate page.
Inputs	The user has to input his login ID and password. This is done using a keyboard.
Processing	The page authenticates the user and then directs him to the next page.

Outputs	The outputs can be success or failure. Success – the user is successfully logged in. Failure – the user can enter an incorrect username/password.

3.2.2 Functional Requirements for Dashboard

Table 5 gives the functional requirements for the Dashboard.

Table 5: Functional requirements for the Dashboard

Purpose	This screen gives the user (Patient) an overview of his past medical records, prescriptions and medical conditions. For the user (Doctor) this screen shows the list of patients that are being treated by the doctor along with their medical reports and for the user (Chemist) this screen shows the inventory, recent orders.
Inputs	The user (Doctor) can enter new prescriptions for the patients using a keyboard. The user (Patient) can enter their medical records using a keyboard
Processing	The page responds to the inputs by redirecting the user and creating entries in the database.
Outputs	Output consists of a redirected page or a successful input of note.

3.2.3 Functional Requirements for New Prescription Screen

Table 6 gives the functional requirements for New Prescription Screen.

Table 6: Functional requirements for New Prescription Screen

Purpose	This screen gives the user (Doctor) to add a prescription.
Inputs	The user first selects if he wants to add a prescription from the dashboard screen. If the user chooses to add then he can provide a variety of inputs through keyboard to create a new prescription.
Processing	The screen responds to the chosen option and stores and modify data in the database accordingly.
Outputs	Output consists of updating the latest prescription on screen.

3.2.4 Functional Requirements for Appointment Booking Screen

Table 7 gives the functional requirements for Appointment Booking Screen.

Table 7: Functional requirements for Appointment Booking Screen

Purpose	This screen gives the user (Patient) to book an appointment with a Doctor.
Inputs	The user selects the time of appointment with the doctor from a given number of options according to the availability of the doctor.
Processing	The screen responds to the chosen option and stores the data in the database accordingly.
Outputs	Output consists of successful appointment booking.

3.3 Performance Requirements

- The software is designed for smartphones. It is unsuitable for running on PC's and websites.
- The software will handle textual and visual information.
- The software can take input from the keyboard and QR scanner.
- For normal conditions, 95% of the modifications should be processed in less than a second.

3.4 Quality Attributes

The product targets three users, i.e. Patients, Doctors and Chemists. The product must load quickly and work well on smartphones. It must also modify the databases rapidly and in real time.

3.5 Other Requirements

None

Appendix A: **Analysis Models**

A.1 Use Case Diagram

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Figure 3: Use Case Diagram

A.2 **Activity Diagram**

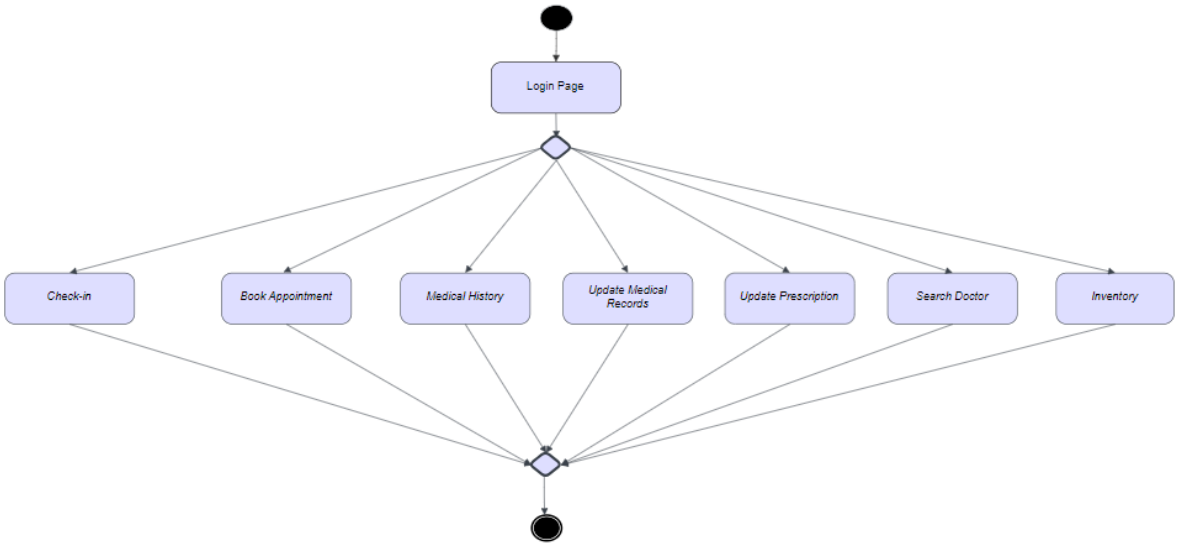

Figure 4: Activity Diagram

A.3 **Class Diagram**

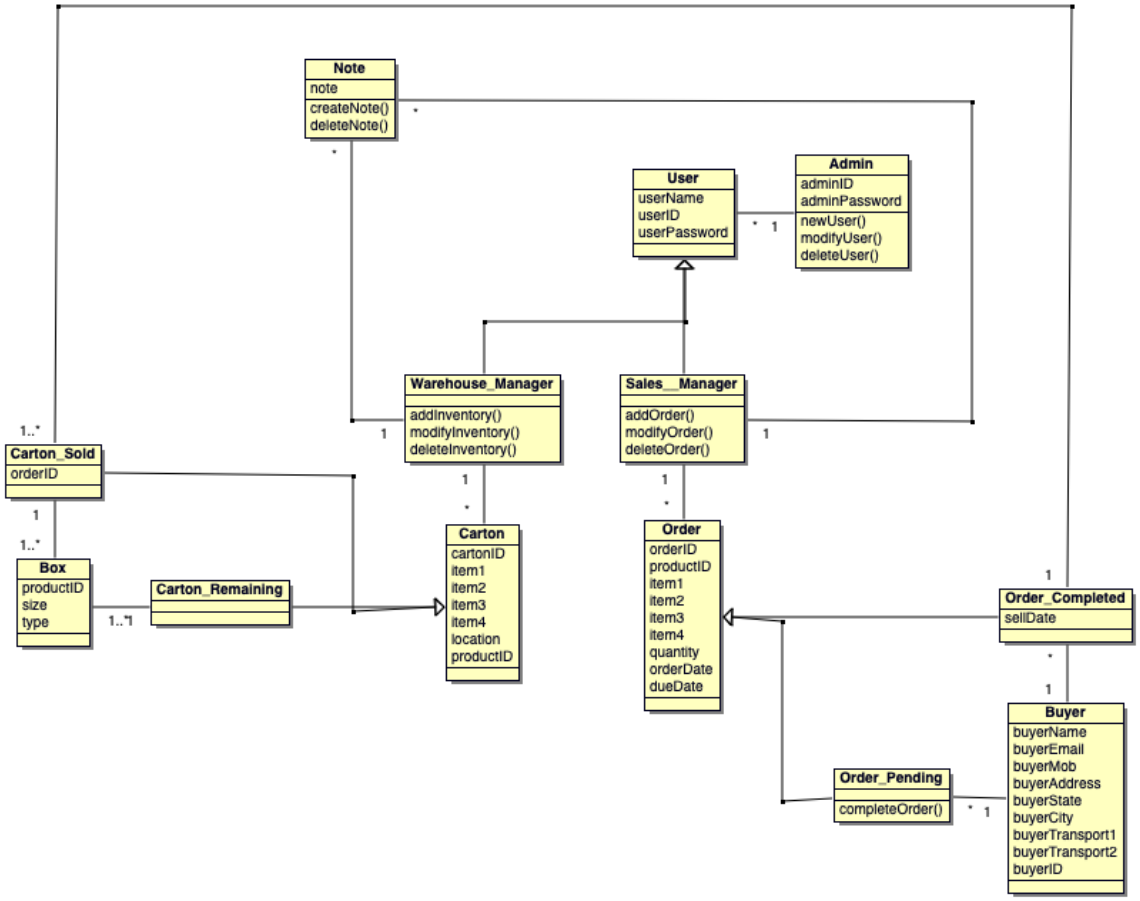

Figure 5: Class Diagram

A.4 **Data Flow Diagram**

A.4.1 **Context Level**

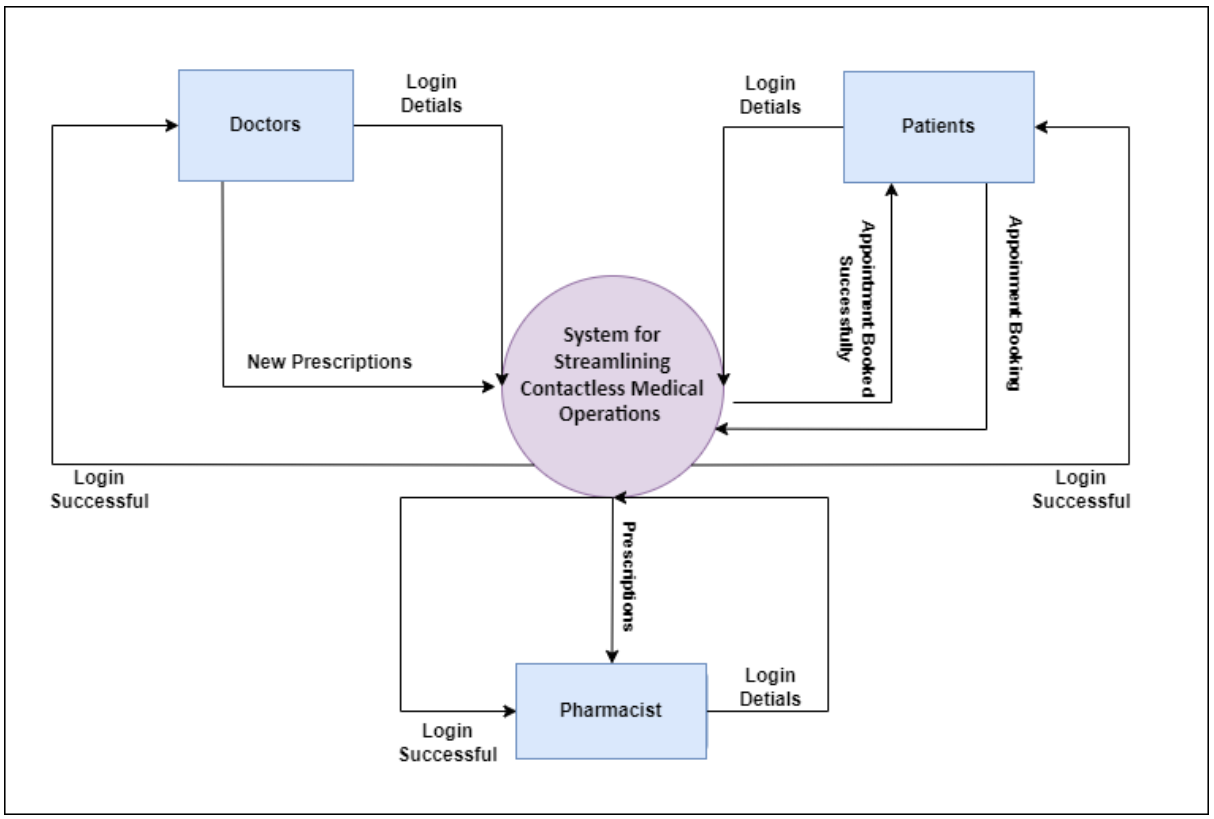

Figure 6: DFD Level 0

4 Revision History

Table 9: Revision History

Name	Date	Reason For Changes	Version
Mayank Gupta	15/09/2023	-	1.0

5 Document Approvers

SRS for SSCOMS is approved by:

_____

Name:
Designation:
Date: