SOFTWARE REQUIREMENTS SPECIFICATION

for

Prescription Safety Checker WEBSITE

Version 1.0

Prepared by : Faria Basher (2220539)

Submitted to : Md Abu Sayed
Senior Lecturer

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1 Introduction

1.1 Purpose

A patient may be affected by multiple diseases at the same time. So, it is very tough to keep prescriptions all the time, and when they go to check for any disease, bring the other prescription to discuss the medicine they take for other health problems. The Prescription Safety Checker is a web-based program that assists doctors and pharmacists in reviewing prescriptions for potential concerns.Detects prescription interactions, allergies, and problems with a patient's medical history. To increase patient safety and help healthcare workers make better decisions, technology sends out rapid alerts and proposes safer alternatives.

1.2 Document Conventions

Abbreviations:

- PSC: Prescription Safety Checker
- UI: User Interface
- API: Application Programming Interface
- DBMS: Database Management System
- HIPAA: Health Insurance Portability and Accountability Act
- GDPR: General Data Protection Regulation

Standards:

- Maintains the IEEE guidelines for SRS documentation.
- Uses industry best practices for data security and privacy compliance.

1.3 Intended Audience and Reading Suggestions

The information within is intended for use by developers, testers, project managers, doctors, pharmacists, and regulatory agencies. Managers and stakeholders should examine Sections 1 (Introduction) and 2 (Overall Description) for project scope and objectives, while developers should concentrate on Section 3 (System Features).

1.4 Project Scope

Prescriptions are checked against a medical database using PSC, a web-based program that integrates with pharmacy systems and electronic health records (EHR). Important characteristics include:

- Analysis of prescriptions in immediate time
- Caution for harmful medication interactions and allergies
- Ideas for safer substitute medications
- Role-based access and user authentication
- Compliance with data privacy and security

1.5 References

- WHO's recommendations on medication interactions
- FDA Drug Interaction Database
- HIPAA Compliance Guidelines
- FHIR API Standards
- Documentation for PHP
- Documentation for MySQL
- The specification for HTML and CSS

2 Overall Description

2.1 Product Perspective

Prescription Safety Checker is a flexible web application that was created using MySQL and PHP. It connects to pharmacy databases and electronic health records (EHRs).

2.2 Product Features

- **Prescription analysis:** Identifies allergies, limitations, and interactions between medications.
- **An Alternative Suggestions:** Offers safer medication substitutes.
- **User Dashboard:** Contains safety reports and prescription history.
- **Notifies in immediate response:** Inform users of possible risks.

2.3 User Classes and Characteristics

- **Doctors:** Before writing a prescription, doctors should review it.
- **Pharmacists:** Before selling, pharmacists should verify prescriptions.
- **Patients:** Look into possibilities and the safety of medications.
- **Administrators:** Control system setup and users.

2.4 Operating Environment

The website will be operate in any Operating Environment - Mac, Windows etc.

- Front-end: JavaScript, CSS, HTML
- Backend: PHP
- MySQL as the database
- Cloud-based hosting that is SSL-encrypted

2.5 Design and Implementation Constraints

- Observe the GDPR and HIPAA data security regulations.
- Needs to work with hospital systems
- Achieve seamless operation even with heavy traffic

2.6 User Documentation

- Doctor and pharmacist user guides
- Chatbot support and online manuals

2.7 Assumptions and Dependencies

- Internet access is required for doctors and pharmacists.
- API connections must be supported by hospitals.

3 System Features

3.1 Identification of interactions between medications

- Target: Assures that prescription drugs don't result in harmful side effects.
- Process: When a doctor inputs a prescription, the system looks for potentially dangerous interactions and notifies the user.
- Requirements:
  - Medicines must be compared to a database by the system.
  - The user must be able to see and understand the messages that appear.

3.2 Verifying Medical History and Allergies

- Target: Makes sure that prescription medications do not cause issues with a patient's health.
- Process: The system notifies users to potential risks by comparing prescriptions with patient records.
- Requirements:
  - Patient history and allergy information must be available to the system.
  - It is necessary to identify high-risk medications and offer substitutes.

3.3 Suggestions for Alternative Medications

- Target: The aim is to offer safe alternatives.
- Process: If a risk is identified, the system recommends safer medications.
- Requirements:
  - AI must be used by the system to propose substitutes.
  - Dosage and administration information must be included in recommendations.

3.4 Management of Roles and User Authentication

- Target: Provides safe access to the system.
- Process: Users access the system by logging in according to their role.
- Requirements:
  - Use a password to secure your login.
  - varying degrees of access for administrators, pharmacists, and doctors.

4 External Interface Requirements

4.1 User Interfaces

- Web-based dashboard with information and notifications that are easy to understand.
- Easy access with a mobile-friendly design.

4.2 Hardware Interfaces

- Compatible with smartphones, tablets, and PCs.

4.3 Software Interfaces

- RESTful APIs to integrate EHR systems.
- A prescription analysis AI engine.

4.4 Interfaces for Communications

- Uses HTTPS to send data securely.
- Supports the sharing of medical data via an FHIR-based API.

5 Other Nonfunctional Requirements

5.1 Performance Requirements

- Request processing must take less than two seconds.
- Should effectively manage extensive hospital networks.

5.2 Safety Requirements

- Sensitive information must be encrypted.
- Backup storage is essential to avoiding data loss.

5.3 Security Requirements

- Must abide by GDPR and HIPAA.
- Data access must be restricted according to user roles.

5.4 Software Quality Attributes

- The modular code structure makes maintenance simple.
- Scalable: Design ready for the cloud.
- User-friendly: UI that is easy to use and intuitive.

6 Requirement Elicitation and Analysis Documents

6.1 Requirement Elicitation Document

Purpose:

- To document the process of obtaining needs from stakeholders such as doctors, pharmacists, and patients

Content:

- Stakeholder Interviews: conducted with five doctors, three pharmacists, and ten patients. Focused on contemporary prescription safety problems.

Observation Studies:

- Pharmacy workflow analysis (10 hours)
- Identified three key pain areas in prescription verification.

Document Analysis:

- Reviewed 15 incidents of drug mistakes.
- Analyzed FDA medication interaction datasets.

6.2 Requirement Analysis and Negotiation.

Purpose:

- This document aims to refine and validate elicited needs through stakeholder negotiations.

Process:

- Feasibility Analysis:
  - Technical appraisal by the development team
  - 12 needs were identified as high-risk.

Conflict Resolution:

- mediated five doctor-pharmacist required disputes.
- Example: real-time alerts vs. workflow interruption.

Prioritization Workshop:

- The MoSCoW technique was applied.
- 23 must-have and 34 should-have requirements were determined.

Trade-Off Analysis:

- Cost-benefit analysis of AI integration.
- Compromise on alert customization levels.

7 Other Requirements

- Integration with inventory systems in pharmacies.
- Better recommendations are achieved by ongoing AI model advancements.

8 Appendices

A. Glossary

- Electronic Health Records, or EHR
- FHIR: Fast Healthcare Interoperability Resources.

B. Models of Analysis

- Use case diagrams for interactions between pharmacists and doctors.
- Workflow diagrams for validating prescriptions.

C. List of Issues

- Completing compliance certificates is still pending.
- Integration with the FHIR standard API has been resolved.