AI-Powered Triage System
System Design Document (SDD)
Version 3

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Contents

Version	Description	Date Added
1.0	Final version for Start Snapshot submission.	12/05/2025
2.0	Added full database design, updated workflow, added CRUD operations and implemented core triage features.	12/08/2025
3.0	Added AI workflow, updated component breakdown to include AI service integration, and expanded UI design to show AI-generated recommendations.	12/10/2025

Version Description

1 Introduction

1.1 Purpose

Version 3 of this Software Design Document (SDD) describes the AI components that generate summaries and triage recommendations based on patients' information. The database and workflow have also been updated to support interactions with the AI model.

1.2 Intended Audience

This document is intended for:

- The instructor and the graders of the CS 3338 course.
- Developers responsible for implementing system components.
- Testers working with TestRail and Jira.
- Future maintainers/contributors of the system, in later snapshots.

1.3 System Overview

The AI-Powered Triage System now includes a defined database structure and a functional workflow for:

- Storing patient information.
- Retrieving patient information.
- Displaying AI output on UI.

2 System Architecture

2.1 Workflow

The workflow of the AI Triage System has been updated to incorporate the AI model as follows:

1. The user logs in through the secure authentication portal.
2. The front-end client requests patient data from the back-end API.
3. The user selects a patient and enters visit information such as symptoms.
4. The back-end stores the visit information in the database.
5. The back-end sends the relevant visit and patient information to the AI model.
6. The AI model returns a summary or triage recommendation.
7. The front-end displays the AI-generated recommendation to the user.
8. The user may update or finalize the visit record.
9. All updates are stored in the database for future reference.

2.2 Component Breakdown

The AI Triage System will consist of the following components:

- **Client-Side (Front-End)** A web interface built using HTML/CSS/JavaScript or a front-end framework like React.
- **Server-Side (Back-End)** A REST API built using Python Flask, FastAPI, or Node.js for:
  - User authentication
  - Database interactions
  - Passing data to/from the AI model
- **Database Layer** A relational database (MySQL) has been defined for storing patient demographics and visit records. The database doesn't interact with AI yet, but supports basic database organization and retrieval.
- **AI Service Layer** The AI Service Layer receives input such as symptoms and visit notes and returns summaries or triage recommendations. The AI model may be an external API like OpenAI GPT or a locally hosted machine learning model.

3 User Interface

3.1 How to Use

Users will be able to interact with the system, using the following components:

- **Patient Profile Page**: Verified healthcare personnel can also enter visit notes, and view their visit history.
- **Dashboard**: To display a list of patients, recent activity, and quick links.
- **Visit Documentation Form**: A structured form for healthcare personnel to complete patient encounter records.
- **AI Recommendation Panel**: Displays AI-generated summaries or triage recommendations based on submitted visit information.

3.2 Database Design Overview

We're considering extending the Visits table with a column for ai-generated recommended output, along with the following tables:

- **Staff** Columns: staff_id, name, email, role, password_hash
- **Patients** Columns: patient_id, name, age, sex, date_of_birth
- **Visits (with possible updates)** Columns: visit_id, patient_id, visit_date, condition, treatment, outcome, ai_recommendation

3.3 UI Screenshots

Screenshots of the tentative UI design may be added in later versions.

4 Glossary

AI - Artificial Intelligence

API - Application Programming Interface

DB - Database

SDD - System Design Document

UI - User Interface

5 References

Current references:

- CS 3338 Lab 14 Instructions (Canvas).
- CS 3338 Final Project Instructions (Canvas).
- Example Final Projects From Past Group (Github).
- Overleaf Documentation: `https://www.overleaf.com/learn`
- HIPAA Overview: `https://www.hhs.gov/hipaa/`