Software Design Document (SDD)

AI-Powered Triage System

CS 3338 – Group 17

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1 Version Description

Version	Description	Date
0.1	Initial creation of SDD layout and core system architecture.	Nov 30, 2025
0.2	Added UI design, database overview, and workflow explanation.	Dec 1, 2025
1.0	Final version for Snapshot 1 submission.	Dec 5, 2025

Table 1: SDD Version Description

2 Introduction

2.1 Purpose

The purpose of this Software Design Document (SDD) is to provide the technical design and system architecture for the AI-Powered Triage System. This document serves as a guide for developers, testers, and future team members.

2.2 Intended Audience

This document is intended for:

- The CS 3338 course instructor and graders.
- Developers responsible for implementing system components.
- Testers working with TestRail and Jira.
- Future maintainers of the AI triage platform.

2.3 System Overview

The AI-Powered Triage System is a web-based healthcare tool that allows authorized medical staff to:

- Log in securely.
- Access patient demographic and historical visit information.
- Receive AI-generated summaries and triage recommendations.
- Complete medical visit documentation assisted by AI.

This SDD describes the structure and behavior of the system and all major components.

3 System Architecture

3.1 System Workflow

The high-level workflow of the system is 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. Data is retrieved from the database and displayed to the user.
4. When the user interacts with the AI, the back-end sends relevant patient information to the AI model.
5. The AI returns a summary or triage recommendation.
6. The user updates the patient's visit history or completes forms.
7. The system stores updated visit documentation in the database.

3.2 Architecture Diagram Description

The system contains the following functional layers:

- **Client-Side (Front-End)** A web interface built using HTML/CSS/JavaScript or a front-end framework such as React or Vue.
- **Server-Side (Back-End)** A REST API built using Python Flask, FastAPI, or Node.js. Handles:
  - User authentication
  - Database interactions
  - Passing data to/from the AI model
- **Database Layer** Stores patient demographic information and historic visit notes using a relational database (PostgreSQL or MySQL).
- **AI Service Layer** Connects to an AI model such as OpenAI GPT or a local machine learning model trained on healthcare text.

4 User Interface Design

4.1 Overview of User Interface

The user interface will consist of the following pages:

- **Login Page**: Allows verified healthcare staff to authenticate.
- **Dashboard**: Displays a list of patients, recent activity, and quick links.

- **Patient Profile Page**: Shows demographics and visit history.
- **AI Chat Interface**: Allows staff to ask triage-related questions.
- **Visit Documentation Form**: A structured form for completing patient encounter records.

4.2 Database Design Overview

The database will contain the following example tables:

- **Users** Columns: user_id, name, email, role, password_hash
- **Patients** Columns: patient_id, name, age, gender, date_of_birth
- **Visits** Columns: visit_id, patient_id, visit_date, condition, treatment, outcome
- **ChatLogs** (optional) Columns: chat_id, user_id, patient_id, timestamp, message

4.3 Using the System

Users interact with the system by:

- Logging in with secure credentials.
- Selecting a patient record from the dashboard.
- Opening the AI assistant to obtain summary information.
- Completing triage documentation with AI-assisted text suggestions.

4.4 Optional UI Screenshots

Because the system is still in Snapshot 1, UI screenshots may not be final. Screenshots will be added as development progresses.

5 Glossary

6 References

- CS 3338 Final Project Instructions (Canvas).

Acronym	Definition
AI	Artificial Intelligence.
UI	User Interface.
API	Application Programming Interface.
DB	Database storing patient and visit data.
SRS	Software Requirements Specification.
SDD	Software Design Document.

Table 2: Glossary of Acronyms

- Overleaf Documentation: `https://www.overleaf.com/learn`
- PostgreSQL Documentation: `https://www.postgresql.org/docs/`
- HIPAA Overview: `https://www.hhs.gov/hipaa/`

7 Appendix

This document represents Version 1.0 for Snapshot 1 and will be updated as the AI-Powered Triage System evolves through additional snapshots.