
Software Requirements Specification

for

Prediction of Heart Attack

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Revisions

Version	Primary Author(s)	Description of Version	Date Completed
Draft Type and Number	Full Name	Information about the revision. This table does not need to be filled in whenever a document is touched, only when the version is being upgraded.	00/00/00

1 Introduction

1.1 Document Purpose

1. *The purpose of this document is to capture the functional requirements of the project from the customer.*
2. *This document will be used by the test team for doing the test plan, test scripts, test cases and test script automation.*
3. *This document will be used by the project manager for making the project plan, project schedule, and project cast.*

1.2 Product Scope

The project scope involves developing a machine learning model to better predict the occurrence of a heart attack. The project involves Machine learning, Deep learning and databases.

1.3 Intended Audience and Document Overview

Tester, Managers, Customers, Product managers, System test group, Development team, DevOps team.

1.4 Definitions, Acronyms and Abbreviations

*DL: Deep Learning.
SRS: Software Requirements Specifications
ML: Machine Learning.*

1.5 Document Conventions

<In general this document follows the IEEE formatting requirements. Use Arial font size 11, or 12 throughout the document for text. Use italics for comments. Document text should be single spaced and maintain the 1" margins found in this template. For Section and Subsection titles please follow the template.

TO DO: Describe any standards or typographical conventions that were followed when writing this SRS, such as fonts or highlighting that have special significance. Sometimes, it is useful to divide this section to several sections, e.g., Formatting Conventions, Naming Conventions, etc.>

1.6 References and Acknowledgments

<List any other documents or Web addresses to which this SRS refers. These may include user interface style guides, contracts, standards, system requirements specifications, use case documents, or a vision and scope document. >

2 Overall Description

2.1 Product Overview

This project is called the Prediction of Heart Attack; it is used to predict the occurrence of heart attack based on existing patient datasets, which consists of factors such as cholesterol, age, gender, blood pressure etc. and the “target” value for that particular patient providing the status of heart attack (occurred or not occurred). This product contains four modules.

- 1. ML algorithm*
- 2. DL algorithms*
- 3. Pandas (SQL), Dataset handler.*
- 4. Database Driver.*

The user provides real-time data of the given health factors and the model predicts the occurrence of a heart attack.

2.2 Product Functionality

- 1. Development of ML Classification Model.*
- 2. Tuning ML model to optimise prediction accuracy.*
- 3. Development of DL Classification Model.*
- 4. Tuning DL model to optimise prediction accuracy.*
- 5. Warning system when a heart attack is predicted.*

2.3 Design and Implementation Constraints

- 1. Size of Dataset and Accuracy.*

2.4 Assumptions and Dependencies

- 1. Quality of Dataset provided.*

3 Specific Requirements

3.1 External Interface Requirements

Networking Interface Requirements.

3.1.1 User Interfaces

1. *System Interface.*
2. *Networking Interface.*

3.1.2 Hardware Interfaces

Not applicable.

3.1.3 Software Interfaces

1. *Communication between dataset, ML/DL algorithms and Model.*

3.2 Functional Requirements

1. *Develop ML algorithms using the below algorithms.*
 - a. *Decision Tree*
 - b. *Random Forest*
 - c. *SVM*
 - d. *Logistic Regression*
 - e. *KNN*
 - f. *Naïve Bayes*
2. *Tuning ML algorithms for maximum accuracy by changing the following parameters.*
 - a. *Changing the size of the Training dataset.*
 - b. *Changing the size of the Testing dataset.*
3. *Develop DL algorithms using the below algorithm.*
 - a. *Using Deep Neural Network Classification.*
4. *Tuning DL algorithms for maximum accuracy by changing the following parameters.*
 - a. *Number of neurons in each layer.*
 - b. *Increasing Epochs.*
 - c. *Increasing hidden layers.*
 - d. *Changing activation functions.*

3.3 Use Case Model

TO DO: Provide a use case diagram that will encapsulate the entire system and all actors.

3.3.1 Use Case #1 (use case name and unique identifier – e.g. U1)

TO DO: Provide a specification for each use case diagram

Author – Identify team member who wrote this use case

Purpose - What is the basic objective of the use-case. What is it trying to achieve?

Requirements Traceability – Identify all requirements traced to this use case

Priority - What is the priority. Low, Medium, High. Importance of this use case being completed and functioning properly when system is depolyed

Preconditions - Any condition that must be satisfied before the use case begins

Post conditions - The conditions that will be satisfied after the use case successfully completes

Actors – Actors (human, system, devices, etc.) that trigger the use case to execute or provide input to the use case

Extends – If this is an extension use case, identify which use case(s) it extends

Flow of Events

1. Basic Flow - flow of events normally executed in the use-case
2. Alternative Flow - a secondary flow of events due to infrequent conditions
3. Exceptions - Exceptions that may happen during the execution of the use case

Includes (other use case IDs)

Notes/Issues - Any relevant notes or issues that need to be resolved

3.3.2 Use Case #2

...

4 Other Non-functional Requirements

4.1 Performance Requirements

We the heart attack is predicted warning has to be predicted with minimal delay (under 0.1 seconds).

4.2 Safety and Security Requirements

The data of the patients must be kept secured.

4.3 Software Quality Attributes

- Accuracy
- Reliability
- Scalability
- Performance
- Cost-efficiency
- Resilience

5 Other Requirements

<This section is **Optional**. Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

Appendix A – Data Dictionary

<Data dictionary is used to track all the different variables, states and functional requirements that you described in your document. Make sure to include the complete list of all constants, state variables (and their possible states), inputs and outputs in a table. In the table, include the description of these items as well as all related operations and requirements.>

Appendix B - Group Log

<Please include here all the minutes from your group meetings, your group activities, and any other relevant information that will assist in determining the effort put forth to produce this document>