Software Requirements Specification

for

Diabetes application

Version 1.0

Prepared by Nazira Munabayeva

Ulster University
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Table of Contents

Revision History

Date	Reason For Changes	Version
21.02.2021	Initial Requirement Specifications Document	1.0 A

1. Introduction

1.1 Purpose

This document includes requirements specification (SRS), functional and non-functional requirements for the Diabetes control application. The document includes a complete purpose, description, and all details of the application development process. This document will be used as a basic design/development tool to better understand all the details of this application.

The main goal of the Diabetes control application is to provide diabetics with a clear, simple, and intuitive application to track and monitor their general health and treatment and support them with the mobile application and the fitness bracelet.

1.2 Document Conventions

In this SRS are used following terminologies and standards:

- Application Program Interface (API): a set of programming instructions and standards by which one computer program can interact with another program.
- Application: a software or program for users to do specific operations.
- Android: Android is a mobile operating system (OS) developed by Google for mobile devices.
- Notification: an alert coming from the application to the device.
- Flutter: an open-source software development kit for building mobile applications from Google.
- PostgreSQL is a free and open-source relational database management system (RDBMS) emphasizing extensibility and SQL compliance.
- BMI (Body Mass Index): a value that allows you to assess the degree of correspondence between the mass of a person and his height and thereby indirectly judge whether the mass is insufficient, normal, or excessive.

1.3 Intended Audience and Reading Suggestions

The document is divided into 4 sections. The general picture of the document gives information about the system specifications of the application. The second section of the document contains information about the main functions of the product, the operating environment of the system, design and implementation constraints, and assumptions. The third section is completely devoted to the functional requirements of the application. The fourth section focuses on non-functional, security, and privacy requirements.

1.4 Product Scope

The application is used for self-monitoring of the health of people with diabetes. The application can be used by the user every day as a tracking and support service. Users can monitor their daily glucose, A1C, heart rate, blood pressure, carbohydrates, as well as other health indicators. The application will be able to calculate standard health indicators such as BMI and provide historical information of the results in a report that the user can send to the doctor or watch for self-analysis. The application works with a wristband that sends information about heart rate, sleep, and steps or other physical activity. In turn, the fitness bracelet and application notify about taking medications or about checking glucose. Also notify if some indicators are above the norm, for example, if a person is running and his heart rate has increased above normal, the system notifies about this that it is time to rest, etc. The application is designed to help the user have complete control over their health data by providing trends and data, as well as sending notifications to the user, support users to make healthier decisions in their life. The application will be simple and straightforward to use, so that old person can also use it without any difficulties.

1.5 References

- IEEE Software Specification Requirement template

2. Overall Description

2.1 Product Perspective

The end result of this project is a product that falls into the category of health applications. This application will support the user to better monitor health and treatment, make decisions for better health using the information provided through the application and a wristband. The key features of the application are described below:

● User account: The application allows the user to register or log in with an existing username and password. It also makes it possible to enter or change personal information.

● Main page: A tab in the app that contains basic health information and attributes, including daily glucose readings or carbohydrate intake, etc.

● Report: A tab in the application that provides all information for specific date ranges (e.g. weeks, months) that contains all information in the past.

● Log: The health data tab was recorded on a specific day. It has the ability to manually enter data for carbohydrates, blood glucose, blood pressure, etc.

● Reminder: A tool that allows the user to be reminded to check the glucose value or take a medication. Also includes a smart reminder that sends notifications when certain health indicators are below or above normal.

2.2 Product Functions

The main functions of the product available to the user include the following parts:

● User Profile: Allow the user to register and enter their data.

● Connecting a fitness bracelet. Allows the user to connect a fitness bracelet that notifies and tracks sleep, steps, and heart rate.

● Main Page and Logs: Provide the user with an interface that shows general health information with the ability to show the last indicators. Also, the smart panel automatically detects which data is normal and which is not. The logs allow you to enter data every day.

● Reminder: This allows the user to set up a notification at the desired time to check glucose or take medications.

● Report Output: Allow the user to view their progress as a report over time ranging from days to months.

2.3 User Classes and Characteristics

Users of the application will be people with diabetes who want to monitor and track their treatment. This application can be used by people who want to lead a healthy lifestyle.

Users who are familiar with the mobile application on Android and with wristbands.

It may take a few short minutes for first-time users to become familiar with the user interface of the application because the application will be simple and easy to understand.

2.4 Operating Environment

The application will be designed for use on mobile devices running Android. After installing the application, the user can fill in personal data. User data will be stored in PostgreSQL database. The user will also need to turn on the Bluetooth to connect to the fitness bracelet.

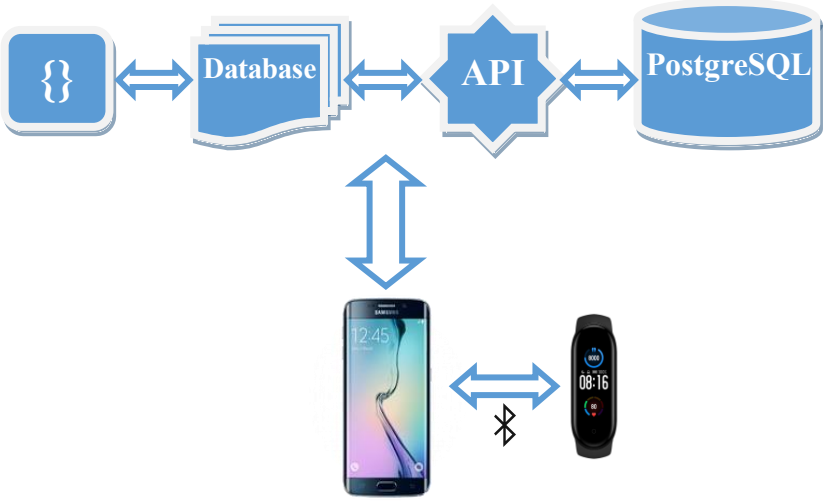

Figure 1. Operating Environment of Application.

2.5 Design and Implementation Constraints

There are many limitations in software development. In particular, I have never created such projects alone before, I have always developed applications in a group. Also, I have all devices for testing an application based on Android, but there may be problems with testing under iOS. Building an application is much more than just writing simple code. The most important thing is to create a clean and intuitive application with a user interface design.

2.6 User Documentation

Since this application is designed to be simple and easy to use, ideally the application will not require additional explanation or support.

2.7 Assumptions and Dependencies

- We assume that the user has access to a mobile device and bracelet.
- We assume that the user is familiar with the basic functions of mobile devices.
- We assume that the user has Internet and a Bluetooth connection.
- We assume that the user has enough memory on the device to install and run applications.
- We assume that the user has no serious physical impairment that could prevent the use of this application (blindness, etc.)
- We depend on the correct operation between the application and the PostgreSQL databases.

3. External Interface Requirements

3.1 Functional Requirements

Functional requirements of the Application:

- This application will allow the user to register.
- The application will allow you to log in and out.
- The user should be able to fill in personal information (full name, height, weight, date of birth, gender).
- The application should be able to connect to the wristband.
- The application should have a main page that contains the latest data on the user's health (A1C, glucose, heart rate, blood pressure, carbohydrates, weight, BMI, steps, sleep).
- The application should be able to calculate and display the BMI of users based on the information provided by the user (height and weight).
- The application should display the user's historical data in the form of a report.
- The user must be able to enter data every day (glucose, carbohydrates, blood pressure, A1C, weight).
- The user can use the reminder to take medications and to check other indicators.

The user must download the application and install it. The user will be able to register, log out.

In the settings section, the user will be able to enter his data and change them. Such data: Name, gender, birthday, height, and weight for BMI calculation. Also, connect the application via Bluetooth with a bracelet and with a glucometer.

The following information will be available on the main page: A1C, blood glucose, heart rate, blood pressure, carbohydrates, BMI, step, sleep. The latest and average indicators will be shown on the main page. If the indicators are above or below the norm, they will be red, and if the indicators are normal, they will be green. The user will need to manually enter glucose data or connect to a meter. The A1C can also be entered by the user. The blood pressure will need to be entered manually. Carbs will need to be led manually with the ability to search in the food database. BMI is considered automatic, but

the weight will need to be entered manually. The application will take information about the heart rate, steps, and sleep through the fitness bracelet.

The following sections will be available in the application menu: main page, logs, reminder, report, and settings.

Logs include pages for data entry. The system automatically detects the time and date. After that, the user can input data about blood glucose, carbs, weight, the type of exercise and the period of time, A1C, blood pressure, and notes. Users can add additional notes to each entry and save them.

The reminder includes 5 actions and the user can customize them. Users can set the time for notifications for glucose checks, medication, physical activity, blood pressure, and weight. The system will notify the user to do these actions and support him. And also the application will have a smart reminder, that will notify when some indicators abnormal. For example, if during the physical activity heart rate will increase, the system advises stopping activity or blood glucose value more than usually.

In the report section, the user can download or send data for the last days and months.

The bracelet will provide data from the system about sleep, step, and heart rate. And also notify the user to check glucose or do exercises that the user has configured.

4. Other Nonfunctional Requirements

4.1 Nonfunctional Requirements

Nonfunctional requirements of the Application:

- The application should be clear to use and intuitive for the user.
- The application must be available to users for use at any time
- The application response should be fast. (i.e. button press, calculations)
- The application makes calculations accurately.
- The application should be reliable, with a minimum of errors and downtime.
- The application should have a secure password.

- The application should save the confidentiality of all user data.
- The application should not affect any other applications or software installed on the user's device.

4.2 Safety Concerns

Possible security issues associated with using the app include:

● Users should not use the application during activities in which they should focus, such as driving a car or airplane, etc.

● Users should consult with their treating doctor before making important medical decisions based on information obtained through the app.