CHAPTER II

PRODUCT DESCRIPTION

This chapter discusses the product perspective and general features of the proposed application that runs on a web - based platform. It also discusses the operating system, including the hardware and software platform that are needed to run the application. The design and implementation constraints which include the constraints that will be taken into account during the implementation phase of the application.

2.1 Product Perspective and General Features

Heart Beat is a web-based application that can be helpful for the heart health of the users. It consists of five general features which supports the purpose of the application. The features are: heart risk status tracker, lifestyle enhancer, accessibility, user-friendly interface and responsive application.

Heart risk status tracking keeps track of the status of the user’s risk of developing stroke, hypertension, and heart attack. Lifestyle enhancer suggests lifestyle changes that includes physical activities, food choices, and behavior changes to the user. Accessibility makes the application usable at any device at any time available due to its operating platform. User-friendly interface is making use of game elements and interactive elements so that users will learn and use the application easily and comfortably. Lastly, the application is responsive to the user’s input. Every major change detected by the application, the results responds to inputs immediately by adjusting the output.

Figure 1. General Features of Heart Beat.

2.1.1 Lifestyle Enhancer

The application provides a series of lifestyle enhancements to improve the heart health. These lifestyle enhancements can be helpful for the users in minimizing the possibility of acquiring cardiovascular diseases. The application identifies critical risks factors then suggest lifestyle enhancement to minimize the risk.

2.1.2 Heart Risk Status Tracker

Progress monitoring is one of the features of the application which keeps track of the heart risk level considering the data taken from the users and the corresponding risk factors. Initially, the application provides a series of questions for the purpose of gathering the data from the users to be used in determining the risk level of their heart. As the time goes by, the heart condition changes considering the different risk factors that are existing in their everyday lives. The application has also a feature that shows the statistical graph of risk level of the users over time.

2.1.3 User-Friendly Interface

Heart Beat is designed to have an unparalleled user-engagement. Applications of this type mostly provide user with technical contents, making the users bored and leave the application. To deviate from the usual approach of delivering contents to users, Heart Beat will make use of a balanced and organized use of graphic and text elements. The application will make use of several game elements such cards for user suggestions and task, badges for rewards for every task completed and a character to help users navigate the application and it also reacts to user’s inputs.

2.1.4 Accessibility

Heart Beat is a web-based application to identify risk of cardiovascular disease, suggest lifestyle changes and maintenance based on the severity of the risk and tracks the heart risk status. The application’s web platform makes it easy for users to access their information and track their status anytime and anywhere. It can increase user’s productivity by not limiting them with a standalone platform.

2.1.5 Responsive

Heart Beat is made to be responsive to whatever changes that the user has made. While the user updates the status, the application adapts to the new data and refreshes the suggestions and the interface. Using a dynamic backend, the application easily changes according to the users’ behavior.

2.2       Operating Environment

This section discusses the different operating environment of Heart Beat during the development phase. Heart Beat is an accessible and user-friendly application which makes web-platform a best option for such features.

Heart Beat is one of these web-based applications. Most of the applications require a hardware specification to run a certain program. Thus, the developers researched and analyzed the possible system requirement that the application might take and come up with these following considerations:

  2.2.1    Hardware Platform

Heart Beat will be developed using a computer with 1.6 Gigahertz processor speed with 2 Gigabytes of random access memory and a free disk space not less than 50 megabytes. It will be tested using a local server on the computer.

2.2.2    Operating System

Heart Beat will be tested and run on Google Chrome, Mozilla Firefox and Opera browser. These browsers have the support for the technologies needed by the application to run. It will be hosted on local web server using XAMPP.

2.2.3    Software Components

The developers decided to use web as a platform of this application. The web application can handle large data than the Android platform without slowing it down. The developers will use Vue.js for the application’s user-interface design with the help of Adobe Photoshop and Adobe Illustrator, while Express.js and Node for its logic and backbone alongside MySQL for its database.

2.3       Design and Implementation Constraints

    Every application has its constraints and limitations. This part will discuss the constraints and limitations encountered upon developing this application by the developers. The following are circumstances in this application that must be considered.

2.3.1 Risk Calculators

Heart Beat uses the risk calculator developed by the Framingham Heart Study Organization. The organization developed these calculators by observing the characteristics that contribute to cardiovascular diseases over a long period of time in a large sample population who had not yet developed or suffered any cardiovascular diseases like heart attack and stroke. The organization provides three calculators that Heart Beat will be using to calculate heart risk of the users. These calculators are: stroke risk calculator, heart attack risk calculator, and hypertension risk calculator. Each calculator has different characteristics and qualifications. The calculators use scoring scheme to predict the risk of the users.

A screenshot of a cell phone

Description generated with very high confidenceTable 2. Stroke Risk Calculator Points System for Men.

Table 2 shows the score distribution of the stroke risk factors for men. The factors includes age, systolic blood pressure, diabetes, smoking, cardiovascular disease history, atrial fibrillation and left ventricular hypertrophe. Age

A screenshot of a cell phone

Description generated with very high confidenceTable 3. 10-Year Stroke Risk Probability per Point for Men.

A picture containing wall

Description generated with high confidence

Table 4. Stroke Risk Calculator Points System for Women

A screenshot of a cell phone

Description generated with very high confidence

Table 5. 10-Year Stroke Risk Probability per Point for Women

    2.3.2    Risk Factors

One feature of Heart Beat is to inform users of the risk factors of a certain cardiovascular disease. Thus, these diseases will only be limited to Heart Attack, Stroke and Hypertension since the developers could not find substantial data that can be quantified in other diseases. The application will use the risk factors identified by the Framingham Heart Study for their risk calculators. Each of the three diseases has common predictors such as: age, gender, blood pressure, and cigarette smoking. Table 6 shows the range of ages that the users can input to have an accurate calculation of risk and at the same time, male or female gender is required from the users.

A screenshot of a cell phone

Description generated with very high confidence

Table 6. Age and Gender Requirements

A screenshot of a cell phone

Description generated with very high confidence

Table 7. Blood Pressure Requirements

A screenshot of a cell phone

Description generated with very high confidence

Table 8. Behavior and Disease History Requirements.

Stroke and heart attack only requires the systolic blood pressure from the user while hypertension requires at least the systolic and the diastolic blood pressure from the user. Other behavioral and historical risk factors require a yes or a no as an input.

2.3.3    Lifestyle Suggestions

    Heart Beat provides a feature that can suggest lifestyle enhancements. These lifestyles lower the risk factors that are identified based on the user’s data. The application will suggest behavior changes, food choices and physical activities.

Heart Beat will use the Dietary Approaches to Stop Hypertension (DASH) for the diet suggestions of users with higher hypertension risk.

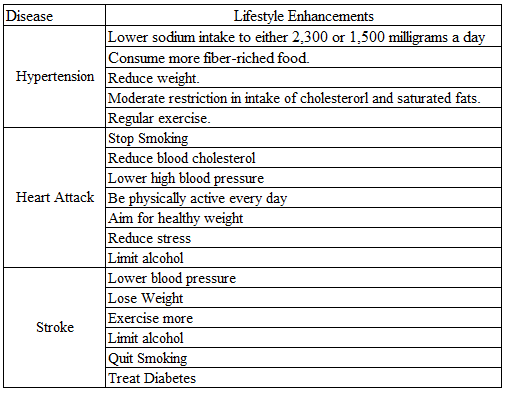


Table 9. General Lifestyle Enhancements.

The application suggests the general lifestyle enhancements that can help reduce risk. Then, the application must also be able to give the users the specific tasks that are subsets of the provided. general lifestyle enhancements.

2.4 Assumptions and Dependencies

The developers have considered the possible scenarios and resources that the application might be using. The consideration is based on the application’s needs for it to operate accordingly as planned. The following are the assumptions and dependencies that the developers have identified:

2.4.1 Assumptions

The developers assumed that the team has enough skills and knowledge in both programming and other necessary skills needed for the completion of the project. The hardware and software platforms are able to carry out the needed operations to come up with the anticipated results. The team will use dummy data for presentation purposes and test the application to users with characteristics that is assumed to have knowledge on his or her blood pressure and hereditary traits that are needed for the application to work accurately.

This chapter shows the features of Heart Beat, its operating environment which is web. The design and implementation constraints that shows the limitations and constraints of this application on the features and technicalities it provides.