Princess Sumaya University for Technology
Department of Computer Science
Spring 2019/2020

All Requirements

Functional Requirements:

Mobile Application and Website:

1. Account Related Functional Requirements:

   a. The program should allow a new user to create a new account. The user will have to provide a valid and unique username. A valid password and a personal phone number.
      - Input: A valid username, a valid password, a valid phone number, a first name, and a last name.
      - Output: Creation of a new account.
      - Constraints: The username should not be longer than 20 characters. The password should contain at least: One number, one lowercase letter, and one uppercase letter. The phone number should be valid.
      - Priority: Mo; must have.

   b. The program should allow a user who entered a password / username combination that matches one in the database to access the account.
      - Input: A valid username and a valid password.
      - Output: The user will be directed to his home page in the application.

- Constraints: The combination of the username and the password entered must match the combination stored in the database.
- Priority: Mo; must have.

c. The program should allow a user who forgot their account's password to reset it using the email address linked to that account.
   - Input: A valid username and a valid phone number.
   - Output: A randomly-generated new password sent to the user's phone number. The user can change this password once he logs in.
   - Constraints: A risk of a lost phone being accessed by other users.
   - Priority: Mo; must have.

d. The program should allow a user who forgot their account's username to reset it using the email address linked to that account.
   - Input: A valid phone number.
   - Output: A randomly-generated new username sent to the user's phone number. The user can change this username once he logs in.
   - Constraints: A risk of a lost phone being accessed by other users.
   - Priority: S; should have.

e. The program should allow the user to login using their phone number instead of the username along with the password.
   - Input: A valid phone number and a valid password.
   - Output: The user will be directed to his home page in the application.
   - Constraints: The combination of the phone number and the password entered must match the combination stored in the database.
   - Priority: Co; could have.

2. User Related Functional Requirements:

a. The program should allow the user to edit information related to their account. Which includes: The username, password, phone number, first name, last name, personal avatar / image, and blood type.
   - Input: Bits of information entered by the user in their respective fields on the GUI.
   - Output: Updated user information being stored in the database.
   - Constraints: The profile editing interface is only accessible to the user after logging in successfully to make sure no user modifies another's information.

- Priority: S; should have

b. The program should allow the user to browse his history of tests done, and scheduled or ongoing tests.
    - Input: User using GUI to access the information.
    - Output: History of tests and a list of scheduled or ongoing tests
    - Constraints: Insufficient information to be displayed.
    - Priority: Mo; must have.

c. The program should notify the user with the following: a) Confirmation of the time, location and type of sample to be taken - specified by the user - once the request has been processed by the system. b) A sample has been tested and the results are ready.
    - Input: None
    - Output: Notification from the system to the user.
    - Constraints: Notification is checked upon sending it to the matching user.
    - Priority: Mo; must have.

3. Collection of data from the form:
    a. The program should allow the user to fill a form detailing the test he'd like to have done and a request for the sample to be taken at home.
        - Input: Bits of information entered by the user in their respective fields on the GUI.
        - Output: Data formatted in JSON.
        - Constraints: Insufficient data entered by the user.
        - Priority: Mo; must have.
4. Processing of collected data:
    a. The program should send an API data request with the correct permission, and parameter in order to process it in the database/
        - Input: Collected data formatted in JSON.
        - Output: Processed data to be stored in the database.
        - Constraints: Data should be secured with its designated user. Token/Key is used to represent the claim between the two parties.
        - Priority: Mo; must have.
5. Storage of data:
    a. The program should properly store the data received in the database.
        - Input: Processed data.
        - Output: Data stored in the database.
        - Constraints: The data should be accurately stored.

- Priority: Mo; must have.

Specimen Tracking System:

1. The system should provide real-time tracking of specimens carried by couriers.
    - Input: Latitude and longitude provided by a GPS device.
    - Output: An accurate position of the courier.
    - Constraints: Connection to the GPS device being lost.
    - Priority: Mo; must have.
2. In case of an emergency, the system should notify the nearest courier to the impaired one. In order to take the best measures.
    - Input: Notification from an impaired courier.
    - Output: Notification to the nearest courier of the incident.
    - Constraints: Need for an active internet connection to send and receive notifications.
    - Priority: S; should have.

Non-functional Requirements:

Mobile Application and Website:

1. Usability:
   All system features shall be simple, transparent, and user-friendly to all archetypes of users. A clean GUI and clear indicators and labels on all text-fields in the forms will allow users to fill them as conveniently as possible.

2. Performance:
   The program shall perform swiftly and smoothly to make sure the forms are submitted in a timely manner so appointments can be made while also delivering results as soon as they’re ready.

3. Security:
   There shall be multiple functionalities in place to provide a secure program that assures the users that their information is safe.
   - No user can access any information unless they login. This will prevent users from gaining access to other users' personal information.
   - All passwords will be hashed and stored in a protected database to ensure no leaks. Or no possibility of reversing the hashing in case of a security breach.

4. Availability:
   The program shall be available for use to fill forms at all times. Exceptions may occur during system maintenance. Which shall be conducted during times of minimum traffic.

5. Portability:
   The program will be available as a website and available to download and run on iOS and android.

Specimen Tracking System:

1. Performance:
   The system shall run in real-time to track the couriers with no delays as long as the GPS hardware device is functioning properly.

2. Usability:
   The system shall use an unambiguous and user-friendly map to track the couriers distinctly. While sending automatic notifications to couriers in case of an emergency being reported.

3. Availability:
   Unavailability might occur during system maintenance. This should not cause significant hindrance to any operations since the maintenance shall be concluded during off-times for couriers.

4. Maintainability:
   Any new couriers being added should not cause any complications to the system as a whole. And maintenance shall conclude during couriers' off-time.

Platform Requirements:

Mobile Application and Website:

The mobile application will be developed using the React JavaScript library for Android and iOS. The application is rather simple and not at all taxing and will run without trouble on almost any mobile device with an active internet connection.
The website will be accessible and should run effectively on any desktop or laptop with an active internet connection.

Specimen Tracking System:

Arduino based vehicle tracking system, which uses a global position system (GPS), and a global system module (GSM). With the use of a SIM card and a GSM Modem, offline use would be permitted. The system would be installed in the interior of the vehicle, allowing the user to track it using a mobile device.

Hardware Requirements:

An arduino based device will be used within the system. Integrating it with the web service developed. The device revolves around the usage of GPS, and GSM, a circuit is designed to track the location of the vehicles using these technologies. The tracking system sends geographical coordinates back to the web server, feeding the data into the cloud. By using this system, we are able to share real time information about transportation. This will also aid the means of transportation by providing shortest paths to a certain coordinate to the user.

GSM module is used in this scenario for sending the coordinates of the vehicle to the server. GPS handles the continuous results of coordinates as a form of string data, known as longitude and latitude. Integrating it with the graphical user interface application, gives us the capability to showcase the location of a vehicle on a map dashboard in real-time.

Software Requirements:

1) Recognition Model Requirements:

With the addition of an Arduino based tracking device, tracking would be effortless. An API would be handling all the traffic between the server, and the application, hosting all the data on the cloud for ease of access and efficiency.

Python

A high-level programming language which serves a general purpose, dynamic, and is widely used within the scope of data scientists. Python allows the use of a variety of functions included for the utilization of data analysis and machine learning

Attributes

1. Create a CSV output to easily read, and manipulate data in a spreadsheet.
2. Integration of SQL (Read, Write)
3. Using PySpark to build a machine learning model
4. NumPy, and Pandas tool for Data Analytics.

2) User Interface Requirements

- **Web Requirements**

  The purpose of a website is to engage, inform, and give ease of access for users with just an internet connection. Investing in a website helps invest in the idea of the project and give room for growth. Variety of tools will be used to develop the application such as:

  1. Front-End
     a. React Javascript
     b. Visual Studio Code
     c. Redux
     d. ESLint
     e. Storybook
     f. React Developer Tools
     g. React-Bootstrap
     h. UI Component Libraries

  2. Back-End
     a. NodeJS
     b. REST API
     c. SQL (MySQL, or MONGO)
     d. PHP

- **Application Requirements**

  A mobile application will be developed and made sure to support several operating systems such as Android, and iOs with high-end performance. Variety of tools will be used to develop the application such as:

  1. Front-End
     a. React Native Javascript
     b. Visual Studio Code
     c. Nuclide
     d. Redux
     e. ESLint

    f. React Native Tools
    g. React Navigation
    h. AdobeXD
    i. Flow
2. Back-End
    a. NodeJS
    b. REST API
    c. SQL (MySQL, or MONGO)
    d. PHP

DESCRIBE EACH TOOL LATER

FIX FORMATTING, APPEND NUMBER 3 INTO THE LIST ABOVE

3) Other Supplementary Requirements

These are the requirements for the mobile application (rephrase later)

- Internet Connection
- Android 5.0 and new, or iPhone 5s and newer.
- RAM of 1GB or larger.
- Must have an internal A-GPS
- A
- B
- C
-