Software Requirements Specification

for

FreeSafe

Version 1.0 approved

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Revision History

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| **Name** | **Date** | **Reason For Changes** | **Version** |
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# Introduction

## Purpose

This document specifies the software requirements for **release 1.0 of FreeSafe**, the flagship mobile application for **Freedom Insurance Private Limited**. The document is intended for thorough review by the developers and Scrum Master at NJL Software Resolutions, to ensure efficient and timely interpretation of the requirements needed to develop the app, as well as by the board of directors at Freedom Insurance Private Limited, to ensure NJL Software Solutions has interpreted your desired features for this project correctly. Our group of dedicated software testers at NJL Software Solutions will also be reviewing this document to provide full coverage in their tests of different iterative sprints of the FreeSafe app.

## Document Conventions

The FreeSafe release 1.0 Software Requirements Specification follows an industry-accepted typographical convention which is meant to reach a broader audience, not just specific to technical detail. An SRS outlined originally designed by Karl Wiegers and Joy Beatty (copyright 2013) is followed with permission. There are some terms specific to the medical industry that are occasionally used in describing desired features of FreeSafe release 1.0. Those will be explained further in the Glossary, Appendix A of the SRS.

## Project Scope

Freedom Insurance Private Limited, a U.S. based insurance company, intends to provide its customers with a mobile app, called FreeSafe, that shall afford the ability to book medical appointments, view availability of doctors and specialists, and compare pricing at both in-network hospitals (those hospitals directly affiliate with Freedom Insurance) and out-of-network hospitals. The app will reduce workload and overhead carried out by hospital customer service representatives who currently field phone calls book, confirm, and cancel appointments. The app's primary use case are Freedom Insurance policyholders with pre-existing medical conditions who require frequent care and visits to health facilities. Based on exhaustive research, Freedom Insurance anticipates customer satisfaction rates to increase by over 65% with the implementation of the FreeSafe app.

FreeSafe shall function identically on both Apple iOS and Android devices. FreeSafe shall provide prices of diagnostic services at listed hospitals in a price comparison matrix. FreeSafe shall also list the doctors working at a particular hospital, including their specialty and typical shift hours during a given week. This information is to be updated in regular intervals on the app as defined in section 3 of the SRS. FreeSafe shall then list the available appointment windows for the doctors, of which an authenticated user shall have the ability to book an appointment in an available slot. The app shall trigger email confirmation of the appointment to the user and the ability to add the appointment to their mobile device's default calendar. An authentication protocol shall be in place to confirm the identity of the user before being able to book appointments or view listings. Finally, the app shall provide an emergency alert button, which when activated, upon a confirmation sequence, shall dispatch an ambulance from the closest hospital to the user's location to their current location.

For further information on the Project Scope, refer to the Vision and Scope document as referenced in Section 1.4.

## References

The FreeSafe Vision and Scope Document is referred to often in the FreeSafe release 1.0 SRS, released on 15 February 2021. An online version of the Vision and Scope Document can be viewed at:

<http://njlsoftwaresolutions.com/resources/freesafe/vision_and_scope.pdf>

Freedom Insurance Private Limited has produced a specification of standards to follow when working with 3rd party vendors for contracted projects. As part of the legally binding agreement between NJL Software Solutions and Freedom Insurance, we are to follow these standards when developing the FreeSafe app and those standards have been considered when composing all details of the SRS. The Freedom Insurance standards can be viewed at:

<http://freedominsurancelimitedusa.com/docs/thirdpartystandards.pdf>

A copy of the contract between Freedom Insurance and NJL Software Solutions is available upon request, signed 2 Feburary 2021 between both parties. Please contact Nick Langan at [nick@njlsoftwaresolutions.com](mailto:nick@njlsoftwaresolutions.com) for more information.

For a listing of all Health Information Privacy regulations, visit <https://www.hhs.gov/hipaa/index.html>.

# Overall Description

## Product Perspective

Since Freedom Insurance's inception in 2004, its policyholders have been primarily managing appointments and visits to doctors by dealing with their respective medical facility directly and using the facility's primary system of booking appointments, typically over the phone, based on research, and in some cases over the web. This affords limited ability for Freedom Insurance policyholders to compare pricing between hospitals in a given area without traversing multiple websites, where such information may or may not be available. It is also difficult to view appointment windows for a patient's doctor of choice, in which some hospitals do not readily disperse such information. Additionally, several insurance providers, including Aetna, now offer mobile options for booking appointments at network and non-network hospitals and medical facilities.

Logically offering a mobile app that affords the ability for policyholders to access information on doctors and appointment windows, compare prices between hospitals, and provide a manner to obtain emergency care (via the emergency alert button) was the next step for Freedom Insurance to undergo growth. Thusly, the FreeSafe app is an entirely new product that does not replicate any service Freedom Insurance is currently offering.

## User Classes and Characteristics

**Freedom Insurance Policyholders**

The most pertinent user class of the FreeSafe app shall be Freedom Insurance policyholders. Based on available data from Freedom Insurance produced in November 2020, the median age of Freedom Insurance policyholders is 65.3 years old, with 54% of policyholders being male. 68% of policyholders have at least one pre-existing medical condition listed. 62% of policyholders made at least one visit to a medical facility in 2019, with 23% requiring an emergency room visit.

A customer satisfaction survey in March 2019 of 130 Freedom Insurance policyholders revealed that the largest desire of customers was an "easy way to compare prices for medical services between hospitals". 1 out of 3 recipients also desired an "easier manner to book appointments". 1 out of 4 recipients expressed dissatisfaction dealing with the booking protocols at their preferred hospital.

There is no discernable difference between users within this policyholder class (i.e. no preferred or "super-users" that would require a different level of administrative access).

All system features, including comparing prices, booking appointments, receiving confirmation emails, and the emergency alert button, will be geared toward policyholders. Keeping in mind the generational differences with the typical age of those using the app might be, some additional steps will need to be taken in terms of the clarity of text and images rendered on the app, to account for those vision-impaired.

**Emergency Room Personnel**

Personnel at a hospital ER will not be directly using the FreeSafe app but shall be receiving notifications when a policyholder generates a trigger of the emergency alert button. Upon reception of the alert, a private ambulance service will be dispatched to the user's location.

**Hospital and Medical Facility Customer Service Personnel**

Availability of doctors and appointments that are booked must align with the respective hospital's internal software or database for managing its appointments and staffing. Access to the FreeSafe database will be afforded at all facilities that opt-in to the FreeSafe app. The ability for receptionists or customer service personnel to view the FreeSafe database via a web portal to ensure it aligns with their respective appointment management system shall be afforded to all facilities that opt-in.

**Freedom Insurance Customer Service Personnel**

All Freedom Insurance customer service helpdesk personnel shall have the ability to masquerade as a policyholder to access the FreeSafe app to guide any policyholders who have difficulty accessing certain functions or features of the app. Freedom Insurance helpdesk personnel shall also be able to override appointments that or booked or cancelled to assist policyholders who may be having trouble navigating the options.

All customer service personnel shall have the ability to access the FreeSafe administrative web portal so that they can reset user credentials when needed should the policyholder contact the helpdesk and request credential reset. The policyholder will need to fulfill a series of security questions before credentials are reset.

**Freedom Insurance Executives**

Designated Freedom Insurance executives shall be granted administrative access to the FreeSafe app and its web portal. The access the executives shall include the ability to:

* Amend hospitals that are listed in the app based on opt-in and opt-outs
* Amend pricing listings based on new information from participating hospitals
* Masquerade as a policyholder to ensure the app is providing the desired experience

**Freedom Insurance Database Administrator**

The Freedom Insurance database administrator shall have the ability to access the FreeSafe database via the web to provide updates and support. The database administrator shall have administrative capability on all facets of the database. At this time, FreeSafe app access is not anticipated for the database administrator.

**Freedom Insurance FreeSafe Project Team**

All designated members of the FreeSafe "project team", employed by Freedom Insurance, are to have the ability to masquerade as a policyholder with the FreeSafe app in an effort to ensure that all requirements of the development of the app are being fulfilled as required. The level of access for the project team is to be normal and not administrative.

## Operating Environment

The FreeSafe app is to be a mobile app that will run on both **Apple iOS devices, including both the Apple iPhone and iPad, and all Android mobile devices**, including the flagship Samsung Galaxy device family. The app shall be listed in both the Google Play and Apple iOs App Store, searchable by users querying "FreeSafe" or "Freedom Insurance". The category for the app be medical.

The geographic location of FreeSafe policyholders is **global**, as Freedom Insurance is currently contracting with medical facilities in both Europe and Asia. 83% of Freedom Insurance policyholders, however, are in the United States, as of March 2021.

Freedom Insurance's customer database is **load-balanced across an array of servers located in Kansas, USA, Manitoba, Canada, and Ohio, USA**, contracted through a 3rd party cloud services provider, OS33. The database is powered by the Oracle SQL platform. All requests for managing appointments and customer data through the app must be produced through Oracle queries. The use of PL/SQL management for the queries is recommended.

Integration with **existing hospital customer appointment databases and management services** is the key to the entire project. Hospitals that are already in-network with Freedom Insurance have prior integration. 68% of surveyed out-of-network hospitals in 2019, per Freedom Insurance research, use Amazon AWS for their customer and appointment management. Thusly, direct integration between Oracle and AWS must be utilized.

The **administrative web portal** for the Freedom Insurance FreeSafe database, which will be used by both hospital and Freedom Insurance personnel, was written using the Oracle WebLogic Portal framework. It is already fully operational and account credentials can be generated for administrative use upon request.

FreeSafe will be generating **email notifications** when appointments are booked or changed or when the emergency alert button is utilized. The email notifications shall be generated through an Office 365 Exchange server, through a 3rd party contract with Microsoft.

## Design and Implementation Constraints

The emergency alert button is to be advertised as **not a substitute for routine 911 or e911 services**. FreeSafe shall be in no way affiliated with 911 centers and shall not notify any emergency dispatch centers of the policyholder's alert when triggered. More information is provided in Section 3.

**Cooperation from out-of-network hospitals** (not already within the Freedom Insurance network) will determine the ability of the FreeSafe app to function as intended. Hospitals must "opt-in" to the FreeSafe app and allow for their appointment management system or database to be integrated with FreeSafe for their appointments, doctors, and pricing to be included in the app.

Many hospitals are experiencing unprecedented appointment and staff load because of the **COVID-19 pandemic**. Freedom Insurance is unable to 100% guarantee accurate and up to date listings and availability at listed hospitals for the duration of the pandemic.

As a medical-affiliated insurance company, Freedom Insurance must be 100% compliant with all HIPAA rules and regulations. As a result, no **patient health information (PHI)** regarding the **reason for a patient appointment booking or hospital visit** is to be stored in the FreeSafe affiliated database. Policyholders shall have the ability to view past appointments and ER visits in the app but shall not have the ability to see the reasons for those visits. The medical facility will contact the policyholder directly to screen for a reason for the visit.

As the app is intended to be used on a global scale, the functionality of the app, including rendering times of appointments and availability windows of doctors, must be delivered in the **timezone** of the user's current location.

## Assumptions and Dependencies

FreeSafe is dependent on the **database and management system** used by those hospitals that opt-in to the service. Integration with Amazon AWS, and hospitals that have in-house database services, ranging from SQL to DynamoDB, must be considered.

Freedom Insurance believes that its policyholders will largely adopt a mobile app for use for booking and managing appointments. With the median age of policyholders, however, it is more likely than not that **some customers will fall into the "laggard" category of adopting new technologies**. If this policyholder segment is larger than anticipated, the FreeSafe app will have more difficulty gaining traction. It is imperative that timely training options be offered for policyholders to gain an understanding of the features of the FreeSafe app.

Freedom Insurance is presuming that the use of the emergency button feature will be exercised judicially, with a proper dialogue sequence to ensure that **accidental triggering** of the feature will be avoided. With proper authentication, Freedom Insurance anticipates this feature should not fall into the hands of someone attempting to cause wrongdoing. However, if medical facilities start to receive a higher than anticipated number of "false alerts", this could have a serious impact on the effectiveness of the alert feature. Training for proper use of the feature is key, and the app must have a proper support mechanism to ensure false alerts are minimized.

# System Features

## User Authentication

### Description

FreeSafe shall authenticate the policyholder upon loading the app based on a two-factor authentication sequence of username and password and PIN number. As an alternative to a PIN number, the user shall have the ability to use the fingerprint sensor on their phone to swipe to access the app. This is a high priority feature of the app.

### Stimulus/Response Sequences

* If the user first enters the app without ever logging in to FreeSafe prior, the user shall have the ability to create an account to use with FreeSafe that shall require entering in their insurance policy number for account creation. TextInput fields shall appear after tapping "sign-up" where the user can enter in their preferred username, email address, password, and policy number.
* If the username or email address is already registered in the FreeSafe database, the user shall be prompted to choose another username or email address.
* The password shall meet the complexity requirements of one capital letter, one lowercase letter, one numeric character, and one symbol. The password must be at least 8 characters long. The user shall have the ability to view the complexity requirements by tapping an (i) button for more information next to the password text field. If the password the user enters does not meet the complexity requirements, the user shall be prompted to choose another password.
* Upon account creation, the user shall be prompted to choose a 4-digit PIN number to be used in the two-factor authentication sequence upon opening the app. This can be any 4-digit sequence and numbers may be repeated.
* If non-numeric values are entered for a PIN choice, the user shall be prompted to re-enter their PIN number choice.
* The user shall also have the option at the time of PIN creation to choose to use their fingerprint as the authentication sequence instead. FreeSafe shall integrate with the default fingerprint swipe handler on the respective Android or iOS device.
* Upon successful login, the user shall be transferred to the FreeSafe app home screen.

### Functional Requirements

* Upon account sign-up, a call from the app to the FreeSafe database will be made to add the user's username, password, and PIN (if applicable) to the database.
* Upon relaunch of the app, the user shall have the ability to store their username and password within the app so that they need not enter it in upon each successive relaunch.
* The user shall need to enter in their PIN or use the fingerprint swipe, however, upon every launch of the FreeSafe app.
* The app shall not have any mechanism to reset the user's password nor PIN built in. If the user forgets their password or PIN, they shall be directed to call FreeSafe support to participate in the security protocol to reset their credentials.

## Prices of Diagnostic Services in all related Hospitals

### Description

In the form of a chart matrix, FreeSafe shall provide prices for diagnostic services within all participating hospitals within a 100-mile radius of the user's current location. The chart shall be arranged with the lowest price to highest price for the diagnostic service in descending order, with the chart color coded (lowest prices are in green, highest prices are in red). The hospital name, distance from the user's location, and the price of the service in question will be featured in bold print on the matrix.

### Stimulus/Response Sequences

* The user shall first select a diagnostic service from a drop-down menu of which they wish to produce a price comparison matrix for. These services shall include but not be limited to X-rays, MRIs, surgeries, CT scans, mammograms, and ultrasound.
* Upon selection of a diagnostic service, the user's current location shall be determined from their mobile device. At this juncture, the app shall check if location services have been enabled for the FreeSafe app. If they have not yet been enabled, the user will be prompted to do so.
* If the user denies location services for the app, no subsequent connection to the database will be initiated and a toast message is to ensue notifying the user that the price comparison table cannot load without location services. The user shall have the ability to tap the a "Settings" button on the toast message to turn location services on for the app if they so desire.
* If location services have been enabled, the user shall access the price comparison matrix screen. The matrix shall load in a grid in which the names of hospitals are listed atop the screen, with the diagnostic service(s) the hospitals offer listed on the left-hand side of the matrix. The listings will be produced in descending order in terms of price, lowest to highest, on a scrollable view.
* Touching a price for a diagnostic service for a respective hospital shall produce a pop-up window in which the user can begin to initiate an appointment at the hospital for the service.

### Functional Requirements

* A call to the FreeSafe database shall occur once the app confirms it has location services enabled for the user and the screen for the price matrix is generated.
* The matrix shall load the closest eight (8) hospitals within a 100-mile radius of the user's current location. If there are not 8 participating hospitals within a 100-mile radius of the user, the next closest hospitals will load.
* The currency of the price generated in the matrix for the diagnostic services shall be based on the user's current location. If in US, the currency produced shall be in USD. If in Canada, the currency shall be produced in CAD. If in Europe, the currency shall be in Euros. If in Mexico, the currency shall be produced in pesos. The app shall not be configured for currency options in Asia at this time. If the user's location falls outside an area covered by the algorithm, the currency will default to USD.
* All listings shall be produced in English language.
* The listings shall be color coded, such that the lowest priced services shall be colored in a bright shade of green, while the costliest of the services offered shall be colored in a bright shade of red.
* The prices of the services shall be printed in bold-faced Arial font.
* The distance of each hospital from the user's current location shall be printed below the name and city of the facility is in at the top of the matrix. If the user is in US, the measurement shall be in miles. For all other global locations, the measurement shall be produced in kilometers.
* The price listings shall be updated once per day, at 11:59 PM Eastern Time. The FreeSafe database shall query the integrated hospitals to determine the prices for services. If a price for a diagnostic service is not available at the time of the query, the listing will be rendered with "N/A" for price unavailable.
* For the drop-down selection the user selected for a diagnostic category, all services related to the diagnostic service shall be displayed in the price matrix. This will be dependent on how the hospital categorizes its diagnostic services. The app shall compare the drop-down selection the user made with the services the hospital offers and determine if they are similar by matching the two string values.

## Profiles of hospitals and their physicians and specialists

### Description

From the home screen of the FreeSafe app, the user shall have the ability to press a button to view the hospitals in their area. Upon selection of a hospital, the user shall be able to view all physicians who provide care at the facility, as well as the location of the hospital and whether the facility is within the Freedom Insurance network. In a list form, they shall be able to see which services the physician specializes in. If the user so desires, they shall book an appointment with the physician in question from their respective profile page.

### Stimulus/Response Sequences

* Touching the "View Hospitals" button on the home page of the FreeSafe app shall trigger a query for location services. If the user has not yet initiated location services, the app will prompt for permission.
* If the user denies location services permission, the app shall default to the last known location the user has provided the app. If the app has never detected a user's location, an error message shall be rendered via a toast message, advising the user that the app cannot proceed without knowing the user's location. The ability to turn on location services will be offered through a "Settings" button on the toast message that will allow the user to toggle the location services permission.
* Should location services be enabled, the "View Hospitals" screen shall load. A scrollable view of the 10 closest hospital facilities to the user's location shall be rendered. The hospital name, city and state or province it is in, and the distance from the user's location, using miles for US and kilometers outside the US, shall be displayed.
* Those hospitals that are within the Freedom Insurance network shall be colored in green. Those hospitals that fall outside the Freedom Insurance network shall be colored in red.
* Tapping the hospital in the scrollable view shall bring the user to an "individual screen" for the respective hospital.

### Functional Requirements

* On the individual hospital screen, the user shall have the ability to tap a button to view listings of the physicians and specialists who work at the hospital.
* On the individual screen, the user shall have the ability to tap a button that launches the default mapping application on the device. The location of the hospital shall be plotted in the mapping app.
* Contact information for the hospital, including primary telephone number, and website address, shall be listed on the individual screen. If the website address is clicked, the hospital's website shall load within the FreeSafe app using a webview.
* If the user selects the physician listings option, an alphabetical listing of all personnel who are provided by the hospital shall be rendered. The listing, in a scrollable view, shall list the physician's name on one line. On the second line, their specialty or area of focus shall be listed.
* If the user taps on the physician's name, they shall be transferred to a screen that will allow them to view available windows to book an appointment with that physician.

## Book appointments with physicians

### Description

Synchronization between the participating hospitals and Freedom Insurance shall allow for queries to be made through the FreeSafe database to retrieve the available appointment windows of the hospital's respective physicians. If the user selects a specific physician from a particular hospital, they shall have the opportunity to book an appointment with that physician through the appointment window feature. The user shall reach a screen, from the physician's profile, that asks the user to select a date that they wish to book an appointment. Upon selection, the timeslots the physician has open on that day shall be rendered. The user can select one of the timeslots and book their appointment in the slot. After a confirmation sequence, the user will receive an email confirming their appointment along with the day and time, and the hospital's own scheduling mechanism will be notified.

### Stimulus/Response Sequences

* The user shall reach the appointment window screen from the physician's profile screen but tapping the "Book an Appointment" button.
* Upon selecting a date to book an appointment, the user can scroll through a list of the available appointment windows the physician has for that day.
* The user can tap an available appointment window to trigger the process to book an appointment.

### Functional Requirements

* Upon reaching the appointment window screen, a query to the FreeSafe database will be made to determine if the physician selected has any available appointment windows in the next 90 days.
* Not all listed physicians in FreeSafe shall have appointment windows. If the user selects a physician whose hospital does not provide available appointments, a toast message shall appear telling the user that the physician does not have any available appointment windows, and to select another physician.
* If the physician does have available appointment windows, the user shall be prompted to select an available date from a drop-down menu.
* Only dates that the physician has available appointment windows shall be listed in the drop-down menu. This will cover dates for the next 90 days.
* The date shall be rendered in the following format: Day of the Week, Month Day, Year (i.e. Thursday, April 7, 2021).
* If the user selects a date, another drop-down menu shall appear directly below, providing available timeslots the physician has for that date.
* Only timeslots that the physician has available shall appear in the timeslot drop-down menu.
* Timeslots shall be rendered in half-hour windows (i.e. 10:00 AM to 10:30 AM, 11:00 AM to 11:30 AM, etc.).
* If the user taps on a timeslot, a pop-up window shall appear seeking confirmation to book the timeslot. The pop-up shall have buttons for "Yes" and "No".
* If the user taps yes, an authorization sequence shall begin, querying the FreeSafe database that the user's Freedom Insurance coverage is in good standing and will cover the physician visit.
* If the authorization is successful, the user shall be taken to a screen confirming their appointment.
* A button shall appear on the confirmation screen that allows the user to take a screenshot that is stored to their device's photos that includes the appointment details.
* A confirmation email shall be triggered upon confirming the appointment, sent to the user's registered email address including details of the appointment.
* On the confirmation screen, there shall be a button to "Add to Calendar" the appointment, which shall bring up an options pop-up window to select the preferred calendar client on their mobile device to sync the appointment with.
* Nowhere in the process shall FreeSafe prompt for a reason for the appointment, to avoid any data transfer or storage of PHI.

## Emergency Button

### Description

In a feature that will be unique to the FreeSafe app, from the app's home screen, the patient can press the "Emergency Button" which will produce a confirmation pop-up. If confirmed, the participating hospital closest to the policyholder's location will be notified to dispatch a private ambulance service to the policyholder.

### Stimulus/Response Sequences

* The user shall access the Emergency Button from the FreeSafe app home screen.
* The button shall be in a bright red color with the words "EMERGENCY BUTTON" in boldface type. The button shall be elevated in contrast to the other buttons on the screen.
* When the button is pressed, an audible tone shall emit from the mobile device for 3 seconds.
* When the button is pressed, a confirmation pop-up window shall appear.
* When the button is pressed, the device shall vibrate for 3 seconds.
* The confirmation pop-up window shall provide buttons at the bottom of the window to confirm the emergency or return to the home screen.

### Functional Requirements

* On the confirmation pop-up window, a message will appear stating that the user understands a private ambulance service will be dispatched to their device's current location, and that if the feature is abused, their Freedom Insurance service may be terminated.
* The message on the pop-up window shall also emphasize that the Emergency Button is not a substitute for 911 services, and that in the case of an emergency, to dial 911.
* If the policyholder confirms they wish to have an ambulance service dispatched, the device shall check whether location services have been enabled. If they have not, the user shall have the opportunity to enable them.
* If the user does not enable location services, the hospital shall not be notified of the emergency.
* If the user's location is determined, the hospital the shortest distance from the user's location shall be calculated.
* Upon confirmation of ambulance service dispatch, the app shall trigger an alert condition that sends a notification from the FreeSafe database to the central management system of the hospital in question. The hospital central management shall be notified in a maximum of 10 seconds after the alert is triggered.
* Upon confirmation of ambulance service dispatch, an email confirmation shall be sent to the policyholder.
* The hospital in question is responsible for dispatching a private ambulance service to the location of the policyholder and the ambulance service shall be in no way affiliated with Freedom Insurance or the FreeSafe app.
* There shall be no mechanism through the app to cancel an ambulance dispatched through the Emergency Button feature. If the policyholder does wish to stop the ambulance service, they shall need to call the hospital in question directly.
* Upon confirmation of ambulance service dispatch, an email confirmation shall be sent to the policyholder's registered email address.
* The Emergency Button shall have the ability to be disabled based on a user account basis, should the policyholder of the user account have found to be using the Emergency Button in a wrongful manner.
* A button shall appear on the confirmation screen that allows the user to take a screenshot that is stored to their device's photos that includes the appointment details.

## Archiving

### Description

Should the policyholder wish to view a list of their past physician visits or usages of the Emergency Button, the FreeSafe app shall provide in archiving feature which queries the events against the FreeSafe database.

### Stimulus/Response Sequences

* From the FreeSafe app home screen, there shall be a button labeled "View My Past History".
* Upon tapping the "View My Past History" button, the app shall render a list, in descending chronological order, of visits to hospitals booked with the FreeSafe app.
* In addition, all visits to Freedom Insurance in-network hospitals and healthcare facilities since November 2010 shall be listed in the archives.
* If the user taps on an event in the list that is rendered, more information on the event shall be returned in a pop-up window.

### Functional Requirements

* Upon reaching the archiving screen, the FreeSafe database shall be queried for all visits by the policyholder's user account.
* FreeSafe shall return a scrollable list view of visits. The displayed text for each event shall render the date of the event, the time of the event, the name of the facility visited, and the location of the facility.
* The pop-up window that is rendered for each event if the user taps on the event in the list view shall contain the same details rendered in the list view, along with the name of the physician who administered the visit (if applicable), and a button that will provide the opportunity to save the visit details as a PDF file to the mobile device's local storage.
* No details about the reason or outcome of the visit, nor the policyholder or insurance cost for the visit, shall be listed in the archives.

# Data Requirements

## Logical Data Model

<A data model is a visual representation of the data objects and collections the system will process and the relationships between them. Include a data model for the business operations being addressed by the system, or a logical representation for the data that the system itself will manipulate. Data models are most commonly created as an entity-relationship diagram.>

## Data Dictionary

Not applicable.

## Reports

The FreeSafe app generates a price comparison of diagnostic services available at participating hospitals within a 100-mile radius. The report is rendered in a matrix form that is color coded to differentiate the highest priced diagnostic services from the lowest cost. The chart shall be arranged with the lowest price to highest price for the diagnostic service in descending order. The hospital name, distance from the user's location, and the price of the service in question will be featured in bold print on the matrix. The report shall not be available to exported out of the app into another document type (such as a PDF).

The FreeSafe app also allows for archiving of all visits to medical facilities made by Freedom Insurance policyholders, rendered in a list format. This report is based off a simple query to the FreeSafe database, based on the policyholder's username. This report is available to be exported to PDF from the FreeSafe app. No details on any medical reason for the visit(s) is to be stored in the archive.

## Data Acquisition, Integrity, Retention, and Disposal

Data from participating hospitals is to be synchronized with the FreeSafe database. Sent out from the hospital, this data includes the names of physicians at the hospitals and the available appointment windows for the physicians. Sent from the FreeSafe app to the hospital, this would include the appointments policyholders book with physicians in the app, as well as any usages of the Emergency Alert Button.

The methods for acquiring the data from hospitals will depend on the management system the hospital uses. All Freedom Insurance in-network hospitals are already synchronized with the FreeSafe database. Hospitals shall not have the ability to write to the FreeSafe database. FreeSafe shall only have the ability to write to the patient appointment portion of a given hospital's database.

Freedom Insurance's database in the cloud is backed up daily through our provider, OS33. All records since November 2010 are retained in the database.

Caching of the database is currently not instituted on the app. Queries and retrieval from the Freedom Insurance database can only take place with a working network connection. Local copies of the Freedom Insurance database are also not permitted.

If a policyholder leaves the Freedom Insurance network, their records shall be maintained in the database for a subsequent ten (10) years after their policy is terminated. Their records shall be moved to a database table called "PENDING\_REMOVAL".

# External Interface Requirements

## User Interfaces

Keeping in mind that the median age of Freedom Insurance policyholders is 65.3 years old, the display renderings on the app must be crafted accordingly, including to account for nearsightedness. Standard fonts in text views, lists, and buttons rendered on the app must be at least **14-point size.** There is no standard as far as font family, but the **Verdana** or **Arial** fonts are suggested for clarity purposes.

Color-blindness shall also be accounted for and Apple's Human Interface guidelines shall be followed for development. This includes the use of text labels where applicable so color-blind users can gather more information (such as between lower and higher prices on the Price Comparison matrix). See <https://developer.apple.com/design/human-interface-guidelines/accessibility/overview/color-and-contrast/> for more information.

It is imperative that the overall layout of FreeSafe be identical on both Apple iOS and Android platforms. It is suggested that the Material design language be used, with compatibility on both platforms and keeping renderings of items such as buttons standard.

Error messages shall be displayed in 100 characters or less and refer to an actionable item the user can perform to correct the issue (e.g. In the case of connectivity loss, encouraging the user to check the strength of their Wi-Fi or Cellular data signal).

## Software Interfaces

The FreeSafe app shall be authenticated and process data queries against the FreeSafe Oracle database. As will be discussed further in Section 6, lists of physician appointments when generated from their profile screen shall be rendered in 20 seconds plus or minus 10 seconds. The price comparison matrix, also generated from a database query, shall be generated in 60 seconds plus or minus 20 seconds to account for connectivity loss.

The FreeSafe database shall be integrated with the interfacing hospital databases that are participating in the Freedom Insurance network. For in-network hospitals, this integration already exists. For out-of-network hospitals, an ODBC connection shall be established. As mentioned in section 2.3, 68% of surveyed out-of-network hospitals in 2019, per Freedom Insurance research, use Amazon AWS for their customer and appointment management.

In terms of the device environment of the FreeSafe app, the app shall not require backgrounds services in neither Android nor iOS. No functionality in the app requires the user to keep the app running in the background. If notifications are generated regarding reminders for appointments, those shall originate from the user's default calendar handler on their device, and not the FreeSafe app.

FreeSafe shall be integrated with the default fingerprint swipe handler native to the Android or iOS environment. If the user has a registered fingerprint swipe, the swipe shall be authorized as the second of the 2FA when initially launching the FreeSafe app.

The minimum supported versions of Android OS and Apple iOS that FreeSafe shall support shall be predicated on the current best practices of Android and Apple respectively.

All email notifications generated by the FreeSafe app shall be handled by the Freedom Insurance network Office 365 plan. Upon confirmation of an appointment or hospital notification via the Emergency Alert button, the app shall trigger an email to be sent from the [notifications@freedominsuranceusa.com](mailto:notifications@freedominsuranceusa.com) master mailbox.

## Hardware Interfaces

FreeSafe shall be intended to be operated on any device supported by the most current version of Android OS or Apple iOS, including phones and tablets. There are many variations of Android compatible devices (as of 2015, there were said to be over 24,000 such devices). FreeSafe shall be intended and tested as to run on the typical Samsung Galaxy environment, such that some differences between operation on other Android devices may be encountered.

There shall be no expected link or functionality between FreeSafe and Apple Watches nor Android Wear.

FreeSafe is intended to be operated on a mobile device only. Freedom Insurance cannot guarantee operation of the app on a desktop emulator environment. There shall be no web-based functionality of the app.

## Communications Interfaces

Appointments and Emergency Alerts that are booked over the FreeSafe app shall be transferred securely (via SSL) to the FreeSafe Oracle database. The creation of the appointment or alert will then notify the hospital's respective database, again also over an SSL-secured connection.

Email notifications shall be generated and delivered to the policyholder's default email address via Office 365 after booking an appointment or generating an Emergency Alert. The email shall be plaintext only and contain no images or HTML.

A web interface shall be used by hospital receptionists or customer service personnel to view the FreeSafe database to ensure it aligns with their respective appointment management system. Freedom Insurance helpdesk personnel shall also have access to the interface to reset or change policyholder credentials when prompted.

# Quality Attributes

## Usability

* + FreeSafe shall have an option for the text input fields that prompt for the policyholder's username and password upon initial launch of the app to remember the last successfully authenticated username and password. The user shall be able to toggle this option by checking or unchecking the "Remember Me" checkbox under the text input fields on the FreeSafe initial login screen. The second step in the 2FA process (either entering a PIN number or using the device's fingerprint swipe) shall still be required.
  + If the user has enabled location services for the FreeSafe app, the services shall need not be enabled again unless the user has disabled the services within the device's settings.
  + The FreeSafe app shall follow the Material Design language, to ensure the same styling and renderings on both the Apple and iOS platforms, and to ensure readability of text and buttons, particularly for those vision impaired.
  + The app shall provide a 1-minute timeout window when the policyholder is in the process of selecting an appointment window for a particular physician. If the user selects a window, shall be reserved that window for 1 minute until they select the "Yes" or "No" options for confirmation. After 1-minute passes, the user shall be returned to the physician appointment list screen and given a pop-up window notifying them that their time to select a window has expired.

## Performance

* + After the Emergency Alert Button notification is confirmed, the closest participating hospital shall be notified within 10 seconds of the pending alert. A corresponding confirmation email shall also be queued up from the Office 365 Exchange server after generating the alert within 10 seconds.
  + The dropdown menu that renders all available physician appointments on a select date shall be rendered within 20 seconds of the query, plus or minus 5 seconds depending on the synchronization with the hospital network. A corresponding confirmation email regarding the appointment booking shall be queued from the Office 365 Exchange server within 10 seconds of confirmation of the appointment.
  + The associated hospital with any FreeSafe appointment booking shall be notified within 10 seconds of the FreeSafe database having been updated with the patient appointment creation.
  + If a doctor's availability window changes, the FreeSafe appointment list shall reflect this change within five (5) minutes (the slot shall be removed from the dropdown menu).
  + The price comparison matrix concerning diagnostics from participating hospitals is to be refreshed with new data daily at 11:59:59 PM Eastern Time.
  + The price comparison matrix of eight (8) competing hospitals within 100 miles of the policyholder's location shall be rendered within 60 seconds of querying for a certain diagnostic condition.
  + Rendering of past appointments and hospital visits from the app shall be rendered in a list within 20 seconds of the query.

## Security

* + All write queries from the FreeSafe app to the FreeSafe Oracle SQL database (hosted by OS33) shall be communicated over SSL.
  + Creation of the policyholder's user account and subsequent authentication against the Oracle SQL database shall also be conducted over SSL.
  + All communication with in-hospital networks shall also be conducted over SSL or TLS. The hospital shall not be added to the Freedom Insurance network until their network can successfully communicate with the FreeSafe database under a secure channel.
  + All communications over the FreeSafe app shall be in accordance with HIPAA guidelines concerning the use of PHI. No PHI shall be stored in the FreeSafe database or retained for any length of time within the FreeSafe app.
  + Five (5) consecutive invalid authentication attempts shall lock the user out of being able to log into the FreeSafe app. The user shall be prompted to call FreeSafe support to unlock their account.
  + No search history shall be stored within FreeSafe, including any queries for price comparisons based on a diagnostic condition.

## Safety

* + If a policyholder's credentials are compromised, they shall contact the Freedom Insurance network helpdesk where their credentials can be frozen or reset upon notification.
  + There shall be no guarantee of response time from a private ambulance service when using the FreeSafe Emergency Alert button. The only guarantee is that the hospital notified shall receive the notification within 10 seconds. Prominently displayed messaging on the Emergency Alert screen shall inform the user that the feature is not to be a substitute for 911 services. If the user is in doubt, they shall be informed to dial 911.
  + The FreeSafe app is not to be used to diagnose conditions nor be a substitute for an in-office physician visit, or a replacement for their regular PCP. If the policyholder has any concerns about booking a physician visit, they shall be directed to contact the hospital or facility directly.
  + The FreeSafe app is designed to conform to all aspects of HIPAA. The hospital or facility is to follow up with the policyholder upon confirmation of an appointment to gather details regarding the reason for a visit.
  + While Freedom Insurance network does business internationally, all health guidelines are to conform specifically to those within North America. Freedom Insurance is not responsible for specific country or province guidelines outside of North America.

## [Others as relevant]

### Installability

* + Downloading of the FreeSafe app shall be conducted from the native Android Google Play and iOS App Store.
  + Querying "FreeSafe" shall prompt a listing of the FreeSafe app within the native app stores on the first page of the search results.
  + The app shall be listed under a "Medical" category.

### Availability

* + Connection to the FreeSafe Oracle database from the app shall be guaranteed to have 99.99% uptime, 365 days a year.

### Efficiency

* + The FreeSafe app shall be limited to six (6) total screens that the user can navigate to and from within the app.

### Scalability

* + Queries written to and read from the FreeSafe database shall be rendered within 10 seconds, supporting up to fifty (50) simultaneous queries within a 3-minute span.

### Verifiability

* + Performance tests are to be conducted in the eight largest Freedom Insurance markets: Harrisburg, PA, Columbus, OH, Wheeling, WV, Clarksville, TN, Paducah, KY, Elmira, NY, Burlington, VT, and Asheville, NC.
  + Performance benchmarks must be met in 9 out of 10 tests in all eight markets to pass functionality prior to the releasing of the app.

# Internationalization and Localization Requirements

<Internationalization and localization requirements ensure that the product will be suitable for use in nations, cultures, and geographic locations other than those in which it was created. Such requirements might address differences in: currency; formatting of dates, numbers, addresses, and telephone numbers; language, including national spelling conventions within the same language (such as American versus British English), symbols used, and character sets; given name and family name order; time zones; international regulations and laws; cultural and political issues; paper sizes used; weights and measures; electrical voltages and plug shapes; and many others.>

# Other Requirements

<Examples are: legal, regulatory or financial compliance, and standards requirements; requirements for product installation, configuration, startup, and shutdown; and logging, monitoring and audit trail requirements. Instead of just combining these all under "Other," add any new sections to the template that are pertinent to your project. Omit this section if all your requirements are accommodated in other sections. >

Appendix A: Glossary

<Define any specialized terms that a reader needs to know to understand the SRS, including acronyms and abbreviations. Spell out each acronym and provide its definition. Consider building a reusable enterprise-level glossary that spans multiple projects and incorporating by reference any terms that pertain to this project.>

Appendix B: Analysis Models

<This optional section includes or points to pertinent analysis models such as data flow diagrams, feature trees, state-transition diagrams, or entity-relationship diagrams. You might prefer to insert certain models into the relevant sections of the specification instead of collecting them at the end.>