

Business Requirement Document: BitOHealth

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Revision History

Version Number	Version Date	Nature of Change	Author of Change
1.0	09/29/2021	Initial draft	Emily Sahyoun, Jacob Munoz
1.2	10/8/2021	Updated	Emily Sahyoun, Jacob Munoz
1.4	10/29/21	Implemented feedback.	Jacob Munoz
1.8	12/04/21	Added Core Requirements	Emily Sahyoun
1.8	12/18/2021	Updated	Emily Sahyoun, Jacob Munoz

Project Overview

Document Purpose

The Business Requirement Document (BRD) for the BitOHealth progressive web application ensures that essential details of every feature are defined and specified clearly. This document is to be developed based on the requirements the developer team created and the client's feedback. This document is intended to include all relevant information regarding the web application's features and should be referred to in relation with the high level design, site map, and technical specification.

Problem

In modern society, as a byproduct of the digital age, there has been an increase in people leading busy and mismanaged lives prioritizing one aspect while disregarding others such as health. Simple habits that improve the quality of life and longevity are disregarded because of the complexity of the health and nutrition industry.

Solution

For the people who are leading busy or mismanaged lives, BitOHealth is a web application that provides organizational and health/nutritional tools that aid in prioritizing health and bringing awareness to concerns. It centralizes many features into one space providing diverse features for the user under the same profile. It is not a replacement for

healthcare or treatment; however, it allows users to consistently keep track and stay updated on their health.

Target Customers

- Busy Individuals - Those with hectic schedules tend to allow various matters in life to take over, leading them to be oblivious to overall health.
- Unorganized Individuals - Holding all valuable medical information in one place can give those with chaotic lives a sense of relief. Setting reminders to ensure consistent completion of goals such as taking medications, going to appointments, etc.
- Low-income Community – Disregard of health is prominent in such communities, so a centralized application focusing on both health and nutrition can encourage them to take action in making healthier habits.

Competition

It is common for people to use multiple applications to target the same concern as many of these apps focus on one task. For instance, one might allow its users to record their medications while the other might be a reminder tool or a calorie calculator. Our goal is to have an all-in-one web application that targets both medical and nutritional concerns by providing diverse features to the user under the same profile.

Scope

Beta versions and older versions of chrome will not be supported as

1. Desktop browser support:

- Chrome 94.0.4606.01 - current up until 7/1/2022

2. Data collected by our site:

- Files : PDF & JPG
- Text
- User data for profile creation : Name, Birthdate, E-mail
- Caloric intake data

- Weight and height information
- User location
- Zip Code

3. Application Type: Web Application

4. Countries Supported: United States of America

5. Languages Supported: English (US) and Español (México)

6. Measurement System: Imperial System and Metric System

- Imperial System for tracking records
- Example: (5 foot 2 inches, 160lb)
- Metric System for Medications
- Example: (5mg Adderall).

Hardware Failure Scenarios

Preconditions 1:

- User is logged in
- User is on any page of the website (Home page, Medication/Health view, and etc.)

Failure Scenarios:

- 1- Database goes offline.
- 2- Internet connection fails.

Handling Failure Scenarios :

- 1- User is notified that servers unexpectedly crashed, and all entries are automatically aborted.
- 2- User is notified that the internet connection is lost and all changes/entries are aborted and to reconnect to the internet.

Failure Postconditions:

User receives an error page and is asked to retry again later.

Preconditions 2:

- User is not logged in

Failure Scenarios:

- 1- Database goes offline
- 2- Internet connection fails

Handling Failure Scenarios :

- 1- User is notified that servers unexpectedly crashed, and is asked to login later
- 2- User is notified that the internet connection is lost and is asked to reconnect to the internet.

Failure Postconditions:

User receives an error page and is asked to retry again later.

Features

1- Medication/Health Recorder

Create Record

Functional Requirement:

System shall allow users to create a record.

Preconditions:

- User must be logged in.
- User must be at the Medication/Health View.
- User must have less than 1000 existing records.
- User must have created less than 10 records within 1 hour.

Required Input:

- User selects Create Record option
- User enters the following information in the designated fields:
 - Category Name:
 - User selects the category from a dropdown list.
 - Only one category can be selected per record. (User will only be allowed to select one)
 - Name of Record:
 - The user enters the name of the record.

- This name will be the first line on the record.
- The name has to be a minimum of 1 character and a maximum of 100.

*The date and time of the record will be exactly when the user made the submission.

Successful Postconditions:

- The record is created.
- The record is automatically saved under the specified category.
 - Each time a record is saved under a category, the record will be reordered by date (most recent- least recent).
- Record is visible in the Medication/Health View.
- User is redirected to the Record View.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from creating a record request.
- 2- User attempts to leave any of the required fields empty.
- 3- User attempts to pick more than 1 category.
- 4- User attempts to exceed the maximum character limit of the name field.
- 5- User attempts to create too many records within a given time frame.

Handling Failure Scenarios :

- 1- System aborts the request.
- 2- User will be notified that input is required.
- 3- Last category selected by the user will be the category of the record.
- 4- Once the user reaches the character limit they will no longer be able to type in the field unless they backspace characters to make space.
- 5- The create button will not be visible to the user and they will be notified for exceeding the record limit for the hour.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the Create Record View.
- View is loaded within 15 seconds from when the user accesses the page.
- The create record process must take a maximum of 2 seconds.
- Created record must match the user's inputted data.

- In case of any failure to create record, user must be notified of the reason.

Input Data on Record

Functional Requirement:

System shall allow users to input data on their existing record.

Preconditions:

- User must be logged in.
- User must be inside the Record View.
- Record must exist.

Required Input:

-Text:

- User will be able to input characters with no minimum or maximum characters inside the record.

- Upload Files:

- User will be able to upload files to record of type jpg or pdf.
- The file must be a minimum of 0.5 MB or a maximum of 16 MB.
- A maximum of 2 files can be uploaded onto a single record per day.
- To select the image or pdf file to upload from a desktop, the user will be prompted to browse their files.
- To select the image or pdf file to upload from a mobile device, the user will be prompted to browse their photo album or their files.
- User will be given the option to select one or more files to upload at once.

- Date and Time (Optional):

- User will be given the option to edit the date and time of the record either by selecting the auto generated current date and time, or by selecting it from a dropdown list.
- Date is dependent on the user's time zone.

Successful Postconditions:

- User is able to make changes to the record.
- User receives a confirmation message that the update of record was successful.
- The record is updated in the database.

Failing Scenarios:

- 1- User attempts to upload a file that is not of type JPG or PDF.
- 2- User attempts to upload a file below the minimum or maximum MB.
- 3- User attempts to upload more than 2 files within 24 hours.

Handling Failing Scenarios:

- 1- File will not upload and the user will be notified that:
 - upload was unsuccessful
 - only upload approved file types.
- 2- File will not upload and the user will be notified that:
 - upload was unsuccessful
 - only upload files within the range of the MB
- 3- The upload file option will not be visible to the user after two file uploads within 24 hours, and the user will be notified for reaching the maximum file uploads for the day.

Failure Postconditions:

- User is unable to input data to the record.
- No updates are made to the database.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Uploading the selected files must take a maximum of 3 seconds.
- Record must be accurate and match the user's inputted data.
- In case of any failure to input data on record, user will be notified of the reason.

Save Record

Functional Requirements:

System shall allow users to save changes made to their existing records.

Preconditions:

- User must be logged in.
- The record must exist.
- User must be in the Record View.

Required Input:

- User selects Save Record option.

Successful Postconditions:

- The contents of the record are saved and the previous version is overwritten.

- User receives a confirmation message that the save was successful.
- Record is saved to the database.

Failure Scenarios:

- 1- User attempts to leave the record before saving.
- 2- User attempts to save the record without making any changes.
- 3- User attempts to leave required user input fields blank.

Handling Failure Scenarios:

- 1- User will be asked to confirm whether they want to save or discard the changes they made to the record.
- 2- The save option will not be visible until the user makes changes to the record.
- 3- The save option will not be visible until the user provides required input.

Failure Postconditions:

Successful postcondition fails and the user will be notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- The saving process should take a maximum of 2 seconds.
- Saved record must be accurate and match the user's inputted data.
- In case of any failure to save record, user will be notified of the reason.
- Record is secure and no data will be leaked.

View Record

Functional Requirements:

User will be able to access a record and view an existing record's content.

Preconditions:

- User must be logged in.
- The record must exist.
- User must be in the Health/Medication Recorder view.

Required Input:

User selects the record.

Successful Postconditions:

- User is inside the selected record.
- User is viewing the record.

Failure Postconditions:

Successful postcondition fails and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Redirecting from Health/Medication Recorder view to Record View should take a maximum of 2 seconds.
- Data being displayed to the user must be accurate and match the record that is being selected.
- In case of any failure to view record, user will be notified of the reason.

Edit Record

Functional Requirements:

System shall allow users to edit an existing record.

Preconditions:

- User must be logged in.
- The record must exist.
- User must be in the Medication/Health Recorder View.

Required Input:

- User selects the record:
 - User will be able to edit the content of the record.
 - User will be able to change the title and/or category of the record:
 - Title can be changed by re-inputting the first line of the record.
 - Category can be changed by selecting an alternative option from the dropdown list.

- User will be able to delete files or add files to the record.
- User must follow the proper guidelines for inputting the title and category of record (refer to Create Record subfeature):
 - User selects only one category.
 - Title ranges from 1-100 characters.
- User must follow the proper guidelines for uploading files (refer to Create Record subfeature):
 - The file type must be of jpg or pdf.
 - The file must be a minimum of 0.5 MB or a maximum of 16 MB.
 - A maximum of 2 files can be uploaded onto a single record per day
- User selects the Save Record Option:
 - User must save all changes made to the record.
 - Record date and time will automatically change to match when the record was edited.

Successful Postconditions:

- Record is updated with the user's changes and the previous version is overwritten.
- User receives a confirmation message that the update was successful.
- The record is updated in the database.

Failing Scenarios:

- 1- User attempts to leave required fields empty.
- 2- User does not follow the proper guidelines for inputting the title and category of record (refer to Create Record subfeature)
- 3- User does not follow the proper guidelines for uploading files on record (refer to Input Data on Record subfeature)
- 4- User does not follow the proper guidelines for saving changes made onto record. (refer to Save Record subfeature).
 - User attempts to leave the record before saving.
 - User attempts to save the record without making any changes.

Handling Failures:

- 1- User will be notified that input is required.

2a Last category selected by the user will be the category of the record.

2b User will be notified to enter at least 1 character in the name field and will not be able to save the record until they do so.

2c- Once the user reaches the character limit for the title they will no longer be able to type in the field unless they backspace characters to make space.

3a- File will not upload and the user will be notified the upload was unsuccessful and to only upload approved file types.

3b- File will not upload and the user will be notified the upload was unsuccessful and to only upload files within the range of the MB.

3c- The upload file option will not be visible to the user after two file uploads within 24 hours, and the user will be notified for reaching the maximum file uploads for the day.

4a- User will be asked to confirm whether they want to save or discard the changes they made to the record.

4b- The save option will not be visible until the user makes changes to the record.

Failure Postconditions:

Successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Updating the content of the record must take a maximum of 2 seconds.
- Data regarding the previous version of the record will no longer be retained by the system.
- Record is secure and no data will be leaked.
- In case of failure to edit record, user will be notified of the reason.

Delete Record

Functional Requirements:

System shall allow users to delete an existing record.

Preconditions:

- User must be logged in.
- User must be at the Record View.

Required Input:

- User must select Delete Record option.
- User must confirm deletion of the record.

Successful Postconditions:

- User is prompted to confirm they are sure they want to delete the record.
- Record is deleted and no longer visible in the Health Recorder View.
- User is notified with a confirmation message that the record has been successfully deleted.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from the Record View.

Failure Handling:

- 1- User is prompted to confirm whether they want to delete the record before exiting.

Failure Postconditions:

Successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- The deletion process must take a maximum of 2 seconds.
- Deleted record must be the correct record the user selected.
- Data regarding the record will no longer be retained by the system.
- In case of failure to delete record, user will be notified of the reason.

2- Reminders

Create Reminder

Functional Requirements:

User will be able to create and be notified of a reminder.

Preconditions:

- User must be logged in.
- User must be in the Reminder List View.
- The user's current Reminder List has less than 99 reminders.

Required Input:

- User selects Create Reminder option.
- User enters the following information in the designated fields:
 - Reminder Name:
 - The user enters the name of the reminder.
 - This name will be the first line on the record.
 - The name has to be a minimum of 1 character and a maximum of 100.
 - Reminder Description:
 - User enters a body describing the reminder.
 - The description ranges from 0-1000 characters.
 - Reminder Date and Time:
 - User sets a date and time using a dropdown list to be notified of the reminder
 - Only future date and time allowed.
 - It is based on the user's time zone.
 - If the time zone changes, the reminder's date will change to match the previous time zone.
 - Reoccurring Reminders:
 - User selects whether the reminder will occur once or will be recurring.
 - If user chooses repeat reminders, they select an option of how often the user wants the reminder to occur. They will be given options of daily, weekly, or monthly.

Successful Postconditions:

- Reminder is created and database is updated.
- Reminder is saved and added to the Reminder List.
- The Reminder List View is updated to reflect the newly added reminder.
- A confirmation message is displayed stating that the remainder has been successfully created.
- User is redirected to the Reminder View.

Failure Scenarios:

- 1- User abruptly exits from creating a reminder request.
- 2- User attempts to leave required fields empty.
- 3- User attempts to exceed the maximum character limit of the name field.
- 4- User attempts to exceed the maximum character limit of the reminder description.
- 5- User attempts to pick a past date and time to set the reminder.

Failure Handling:

- 1- System aborts creating a reminder.
- 2- User will be notified that input is required.
- 3,4- Once the user reaches the character limit they will no longer be able to type in the field unless they backspace characters to make space.
- 5- User will not be able to select any past date from their current date.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Reminder must be added to the Reminder List View in a maximum of 2 seconds.
- User is redirected from the Reminder List View to the Reminder View in 2 seconds.
- Created reminder must match the user's inputted data.
- In case of any failure to create reminder, user must be notified of the reason.

Edit Reminder

Functional Requirements:

System shall allow users to edit the content of an existing reminder.

Preconditions:

- User must be logged in.
- User must be in the Reminder List View.
- The reminder must exist.

Required Input:

- User selects the Edit Reminder option.
- User selects the reminder.
 - User will be able to change the name, description, date, repeat reminders, and time fields of the reminder by deleting and refilling the fields.
 - User must follow the proper guidelines (refer to Create Reminder subfeature):
 - Name must be a minimum of 1 character and a maximum of 100.
 - Description must be a maximum of 1000 characters.
 - Only future date and time allowed.
 - How often they want reminder to repeat (if applicable)
 - User selects the Save option.
 - User must save all changes made to the record.

Successful Postconditions:

- The contents of the reminder is saved and the previous version is overwritten.
- The Reminder View and Reminder List View should reflect changes made by the user.
- User is notified with a confirmation message stating that the record has been successfully updated.
- The reminder is updated in the database.

Failure Scenarios:

- 1- User abruptly exits from editing the reminder without saving.
- 2- User attempts to leave required fields empty.
- 3- User does not follow the proper guidelines for inputting the reminder name, description, or date and time.

Failure Handling:

- 1- User is notified to confirm whether they want to save or discard the changes made.
- 2- User will be notified that input is required and they will not be able to continue without it.
- 3a User will be notified to enter at least 1 character in the reminder name field.
- 3b- Once the user reaches the character limit they will no longer be able to type in the description field unless they backspace characters to make space.
- 3c- User will not be able to select any past date from their current date.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- User must be redirected from Reminder List View to Reminder View at a maximum of 2 seconds.
- Updating the content of the reminder must take a maximum of 2 seconds.
- Updated reminder must be accurate and match the user's inputted data.
- Data regarding the previous version of the reminder will no longer be retained by the system.
- In case of failure to edit reminder, user will be notified of the reason.

View Reminder

Functional Requirements:

System shall allow users to view an existing reminder from their Reminder List.

Preconditions:

- User must be logged in.
- User must be in the Reminders List View.
- At least 1 reminder must exist.

Required Input:

- User selects the reminder in the Reminder List.

Successful Postconditions:

- User is inside the selected reminder.
- User is viewing the content of the reminder.

Failure Postconditions:

Successful postcondition fails and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- User must be redirected from Reminder List view to Reminder View at a maximum of 2 seconds.
- Data being displayed to the user must be accurate and match the reminder that was selected.
- In case of any failure to view reminder, user will be notified of the reason.

Delete Reminder

Functional Requirements:

System shall allow users to delete an existing reminder off their Reminder List.

Preconditions:

- User must be logged in.
- User must be in the Reminder View.
- At least 1 reminder must exist.

Required Input:

- User selects the Delete Option.

Successful Postconditions:

- Reminder is deleted and no longer visible in the Health Recorder View.
- User is notified with a confirmation message that the reminder has been successfully deleted.
- Database is updated.

*Note: Past reminders will be deleted automatically in 30 days to reduce clutter.

Failure Scenarios:

1- User abruptly exits from Reminder View before deleting.

Handling Failures:

1- User is notified to confirm whether they want to delete the record before exiting.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- The deletion process must take a maximum of 2 seconds.
- Deleted record must be the correct reminder the user selected.
- Date regarding the reminder will no longer be retained by the system.
- In case of any failure to delete reminder, user will be notified of the reason.

Export Reminder

Functional Requirements:

System shall allow users to export existing reminders.

Preconditions:

- User must be logged in.
- User must be in the Reminder View.
- At least 1 reminder must exist.

Required Input:

- User selects Export Reminder Option
 - To export a reminder from a mobile device, the reminder will be exported as an iCal and saved to their Files to manually be added to 3rd party services.
 - Web Hosted iCal feed for synchronization between devices.

- To export a reminder from a desktop, the reminder will be exported as a iCal and the user chooses where to save it.

Successful Postconditions:

- Reminder is exported to the user's chosen destination.
- User is notified with a confirmation message that the reminder has been successfully exported.

Failure Scenarios:

1- User abruptly exits the Reminder View before the export reminder request is completed.

Failure Handling:

1- User is notified to confirm whether they want to export the reminder before exiting.

Failure Postconditions:

Reminder is not exported and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Exporting reminder process must take a maximum of 3 seconds.
- No data will be leaked during the export process.
- Exported reminder must be accurate and match the one the user selected.
- In case of any failure to export reminder, user will be notified of the reason.

Opt-in Notifications

Functional Requirements:

System shall allow users to be notified of their reminders.

Preconditions:

- User must be logged in.
- User must be in the Reminder List View.

- At least 1 reminder must exist.

Required Input:

- User selects the Opt-In Notifications Option.
- User selects reminder preference
 - Calender or email.

Successful Postconditions:

- The user will be notified at the proper timing via email or calendar.
- iCal hosted instance on web server.
- 1 email per minute to prevent spam.

Failure Scenarios:

- User abruptly exits from the Reminders List before confirming their Opt-In Notifications choice.

Failure Handling:

- System will force the user to confirm before exiting from the Reminders List.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- User must receive the notification at the exact date and time of the reminder.
- Only the system administrator can view the user's verified email.
- In case of any failure of opt-in notifications, user will be notified of the reason.

3- Health Locator

Start Search

Functional Requirements:

System shall allow users to search for health related locations near their area.

Examples: hospitals, parks, gyms, therapists, pharmacies, clinics, specialists w/o doctor approval (eg dentists, eye doctor, etc).

Preconditions:

- User must be logged in.
- User must be in the Health Locator View.

Required Input:

- User selects the Health Locator Search option.
- User selects a category to choose from.
- User enters the following information in the designated fields:
 - Valid Zip Code:
 - The zip code is 5 characters.

*Note: If the user doesn't have a zip code they must input the nearest one to their location.

- Mile Radius:
 - Radius must range between 1 to 50 miles.

Successful Postconditions:

- Search displays the location's name and distance from the user's inputted zip code.
- Search will only return a maximum of 50 results ordered by closest to furthest proximity from the user.
- After user selects a specific location, additional information regarding the location is displayed to the user.

*Example: Location's hours, phone number, and website.

- Search may return 0 results.
- If no services are near the user's location, user is informed.

Failure Scenarios:

- 1- User abruptly exits the Health Locator Search Option before submitting.
- 2- User abruptly exits before the search is completed.
- 3- User attempts to leave any required inputs empty.
- 4- User attempts to select from more than one category.
- 5- User attempts to input an invalid zip code where:

- Zip code does not exist.
- Zip code includes noninteger characters.

6- User attempts to input an invalid mile radius where:

- Mile radius is below the minimum requirement of 1 mile.
- Mile radius is above the maximum requirement of 50 miles.
- Mile radius contains non integer characters.

Failure Handling:

- 1- System will abort the search request.
- 2- User must confirm whether they want to leave the search request.
- 3- User will be notified that input is required and they will not be able to continue without it.
- 4- Last category selected by the user will be the chosen one.
- 5- User will be notified to enter a valid zip code.
- 6- User will be notified to enter a valid mile radius.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- It must take a maximum of 3 seconds to conduct the search.
- Data being displayed must be accurate and match the search made by the user.
- In case of any failure to display results, user will be notified of the reason.

4- Medication Lookup

Start Search

Functional Requirements:

System shall allow users to search and find medications at the most affordable prices from different vendors.

Preconditions:

- User must be logged in.
- User must be in the Medication Lookup View.

Required Input:

- User selects the Medication Search option.
- User enters the following information in the designated fields:
 - Name of Medication:
 - Name ranges from 1-100 characters.
 - Recommended options will be suggested to the user depending on what they inputted.
 - Zip code.
 - Zip code must be 5 characters long.
 - *Note: If the user doesn't have a zip code they must input the nearest one to their location.
 - Mile Radius:
 - Mile radius must range between 1-50 miles.
- Alternatively, user will be given the option to search for medication details from an auto-generated list of medications.

Optional Input:

- User selects the sort option.
 - By price: cheapest or most expensive first.
 - By proximity: closest or furthest away in radius first.

Successful Postconditions:

- Search displays the different vendors within the radius of the user that offers the medication.
- Search displays the list of prices associated with the medication.
 - Prices will be in US dollars.
 - Price will be the price at the time the user searched for the medication.
- Search may return 0 results:
 - No search results will be displayed if the user inputs unavailable medication.
 - No search results will be displayed if the user misspells a medication and the spelling checker is unable to fix it.
- A maximum of 50 results will be displayed.
- Sort updates the Medication Lookup View.

Failure Scenarios:

- 1- User abruptly exits the Medication Search option before submitting.

- 2- User abruptly exits before the search is completed.
- 3- User attempts to leave any required input empty.
- 4- User misspells medication.
- 5- User attempts to exceed the maximum character limit of the medication name field.
- 6- User attempts to input invalid zip code where:
 - Zip code does not exist.
 - Zip code contains non-integer characters.
- 7- User attempts to input invalid mile radius:
 - Mile radius is below the minimum requirement of 1 mile.
 - Mile radius is above the maximum requirement of 50 miles.
 - Mile radius contains non-integer characters.

Failure Handling:

- 1- System will abort the medication search request.
- 2- User must confirm whether they want to leave the medication search request.
- 3- User will be notified that input is required and they will not be able to continue without it.
- 4- No results will be returned, suggest to users what they meant to type
- 5- Once the user reaches the character limit they will no longer be able to type in the field unless they backspace characters to make space.
- 6- User will be notified to enter a valid zip code.
- 7- User will be notified to enter a valid mile radius.

Failure Postconditions:

All postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- It must take a maximum of 3 seconds to conduct the search.
- It must take a maximum of 2 seconds to sort the Search List.
- Data being displayed must be accurate and match the search made by the user.
- In case of any failure to display results, user will be notified of the reason.

View Medication

Functional Requirements:

System shall allow users to view details on a searched medication.

Preconditions:

- User is logged in.
- User is in the Medication Lookup View.
- User successfully searched for a medication.
- Search displays at least one medication.

Required Input:

- User selects a medication retrieved from the Search List.

Successful Postconditions:

- Displays all locations of the vendor within the user inputted radius.
- Displays information regarding the medication.

Example: side effects, requirement of prescriptions, etc.

Failure Postconditions:

- All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- User must be redirected from the Medication Lookup View to the Medication View in a maximum of 2 seconds.
- Data being displayed to the user must be accurate and match the medication that was selected.
- In case of any failure to view medication, user will be notified of the reason.

Favorite Medication

Functional Requirements:

System shall allow users to favorite medication vendors for a specific medication.

Preconditions:

- User must be logged in.
- User must be in the Medication View.

- User has less than 100 favorites in the Favorite List.

Required Input:

- User selects the Favorite option.

Optional Input:

- User deselects the Favorite option.

Successful Postconditions:

After favoriting:

- Medication vendor is favorited.
- Medication vendor is added to the Favorite List so the user can refer back to it.
- Database is updated.

After removing favoriting:

- Medication vendor is unfavorited.
- Medication vendor is removed and no longer saved to the Favorite List.
- Database is updated.

Failing Postconditions:

- All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Favoriting and unfavoriting a medication vendor must take a maximum of 2 seconds to appear in the Medication View (change in heart color).
- Favorite must be added to the Favorite List in a maximum of 2 seconds.
- Optional:
 - Favorite must be removed from the Favorite List in a maximum of 2 seconds.
- Favorited/Unfavorited medication vendor must be the correct one the user selected.
- In case of any failure to favorite/unfavorite, user will be notified of the reason.

View Favorite List

Functional Requirements:

System shall allow users to view their Favorite List which includes their favorite vendors for specific medications.

Preconditions:

- User must be logged in.
- User must be in the Medication Lookup View.

Required Input:

- User selects the Favorite List option.

Successful Postconditions:

- User is redirected to the Favorite List View.
- The Favorite List is displayed to the user.
- Selecting an item off the favorite list will take the user to the Medication View which displays its different locations and information.
 - User may favorite/unfavorite a medication vendor from the medication view.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Redirecting user from the Medication Lookup View to the Favorite List View must take a maximum of 2 seconds.
- Data being displayed must be accurate.
- Optional:
 - Updating the Favorite List View when the user favorites/unfavorites a medication vendor must take a maximum of 2 seconds.

Refill Medication

Functional Requirements:

System shall remind users to refill their medications near their refill date.

Postconditions:

- User must be logged in.
- User must be in the Medication View.

Required Input:

- User selects the Refill Reminder Option.
- User enters the following information in the designated fields:
 - Refill Date and Time to be reminded:
 - User sets a date and time using a dropdown list to be notified of the refill.
 - Only future date and time allowed.
 - It is based on the user's time zone.
 - If the time zone changes, the reminder's date will change to match the previous time zone.
 - Reoccurring Time:
 - User chooses whether a refill reminder will occur once, or will be recurring.
 - If user chooses repeat reminders, they select an option of how often the user wants the reminder to occur. They will be given options of daily, weekly, or monthly.
 - Reminder Preference:
 - Calendar or email.

Successful Postconditions:

- The user will be notified at the proper timing via email or calendar.
- iCal hosted instance on web server.
- 1 email per minute to prevent spam.

Failure Scenarios:

- 1- User abruptly exits from creating the refill reminder request.
- 2- User attempts to leave required fields empty.
- 3- User attempts to pick a past date and time to set the refill reminder.

Failure Handling:

- 1- System aborts adding reminder to the reminder list.
- 2- User will be notified that input is required.
- 3- User will not be able to select any past date from their current date.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- User must receive the notification at the exact date and time of the reminder.
- Only the system administrator can view the user's verified email.
- In case of any failure to notify user of refill medication reminder, user will be notified of the reason.

5- Weight Management/Calorie Counter

Input Weight Goal Data

Functional Requirement:

System shall allow users to create an entry to input data regarding their weight goals

Preconditions:

- User must be logged in.
- User must be at the Weight Management View.
- User information from Profile is received.

Required Input:

- User selects the Create Goal Option.
- User enters the following information in the designated fields:
 - Target Weight:
 - User enters their target weight.
 - Target weight must be an integer.

*Note: weight will be in pounds (lbs)

- Exercise Schedule:
 - The user will select one choice from the given exercise schedule options.
 - Example: No exercise, Low exercise, High Exercise, etc.
- Time Frame:
 - User selects an ideal date to reach their weight goal from a dropdown list.
 - Only future date and time allowed.
- Upload Files:

- User will be able to upload files of type jpg or pdf.
- The file must be a minimum of 0.5 MB or a maximum of 16 MB.
- A maximum of 2 files can be uploaded per day.
- To select the image or pdf file to upload from a desktop, the user will be prompted to browse their files.
- To select the image or pdf file to upload from a mobile device, the user will be prompted to browse their photo album or their files.
- User will be given the option to select one or more files to upload at once.

Successful Postconditions:

- User will be able to track their weight loss/gain progress by uploading daily images for 90 days.
- User input will be used to make calculations for reaching inputted goal weight.
- User will be notified if they are off target from their goal.
- User is notified with a confirmation message that the data has been successfully saved.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from the Create Goal Option before inputting all the required information.
- 2- User attempts to leave any of the required fields empty.
- 3- User attempts to put nonintegers in integer fields.
- 4- User attempts to pick a past date and time for their time frame.
- 5- User attempts to upload a file that is not of type JPG or PDF.
- 6- User attempts to upload a file below the minimum or maximum MB.
- 7- User attempts to upload more than 2 files within 24 hours.

Failure Handling:

- 1- System will abort the Create Goal request.
- 2- User will be notified that input is required.

- 3- User will be notified to only use integers.
- 4- User will not be able to select any past date from their current date.
- 5- File will not upload and the user will be notified that:
 - upload was unsuccessful
 - only upload approved file types.
- 6- File will not upload and the user will be notified that:
 - upload was unsuccessful
 - only upload files within the range of the MB
- 7- The upload file option will not be visible to the user after two file uploads within 24 hours, and the user will be notified for reaching the maximum file uploads for the day.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Uploading the selected files must take a maximum of 3 seconds.
- Saved data must be accurate and match the user's inputted data.
- Data is secure and will not be leaked.
- In case of any failure to input data, user will be notified of the reason.

Edit Weight Goal Data

Functional Requirement:

System shall allow users to change and update their weight goals.

Preconditions

- User must be logged in
- User must be in the Weight Management View

Required Input:

- User selects the Edit Goal Option.
 - Required fields are editable.
- User may refill the target weight, exercise schedule, and date.
- User may delete previous files and upload new files for the day.
- User must follow the proper guidelines for each input:
 - The ideal weight must be a number.
 - Only future date and time is allowed.
 - Only one exercise schedule can be selected.
 - The file type must be of jpg or pdf.
 - The file must be a minimum of 0.5 MB or a maximum of 16 MB.
 - A maximum of 2 files can be uploaded per day.
- User selects the Save Goal Option:
 - User must save all changes made to their goal.

Successful Postconditions:

- Weight goal is updated and updated on database.
- Updated weight goal is reflected in the Weight Management View.
- User is notified that the Weight goal was edited successfully.
- Database is updated.

Failure Scenarios:

- 1- User abruptly leaves while editing in Weight Management View.
- 2- User attempts to leave required fields empty.
- 3- User does not follow the proper guidelines for inputting the ideal weight and time frame.
- 4- User does not follow the proper guidelines for uploading files
- 5- User attempts to leave the record before saving.
- 6- User attempts to save the record without making any changes.

Failure Handling:

- 1- System aborts editing and no changes are made.
- 2- User will be notified to input data on all required fields.
- 3- User will be notified to follow the proper guidelines where the ideal weight must be an integer and the date must be a future date.

4- File will not upload and the user will be notified to follow the proper guidelines.

5- User will be asked to confirm whether they want to save or discard the changes they made to the record.

6- The save option will not be visible until changes are made.

Failure Postconditions:

Any of the failure scenarios failing

Nonfunctional Requirement:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Updating the contents of weight goal must take a maximum of two seconds.
- Updated weight goal must be accurate and match the user's inputted data.
- Data regarding the previous version of weight goal will no longer be retained by the system.
- In case of failure to edit weight goal, user will be notified of the reason.

Search Food Item

Functional Requirement:

System shall allow users to document their food and calorie intake for the day.

Preconditions:

- User must be logged in
- User must be Food Log View

Required Input:

- User selects the Search Food Option.
 - User must select a category to add the food to. Example: Breakfast, Snack, Lunch, etc.
- User searches for the food item using the search bar.
 - Input the name of the food.
 - The name has to be a minimum of 1 character and a maximum of 100.

Successful Postconditions:

- Search returns food item and its calories that correspond to the user's input.
- Search can return 0 items.
 - No search results will be displayed if the user inputs unavailable food or incorrect spelling of the food name.
- A maximum of 50 results can be displayed.

Failure Scenarios:

- 1- User abruptly exits the Add Food Option before submitting.
- 2- User abruptly exits before the search is completed.
- 3- User attempts to exceed the maximum character limit of the food name field.

Failure Handling:

- 1- System will abort the food search request.
- 2- User must confirm whether they want to leave the food search request.
- 3- Once the user reaches the character limit they will no longer be able to type in the field unless they backspace characters to make space.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- It must take a maximum of 3 seconds to conduct the search.
- Data being displayed must be accurate and match the search made by the user.
- In case of any failure to display results, user will be notified of the reason.

Add Food Item

Functional Requirement:

System shall allow users to add food items to their Food Log.

Preconditions:

- User must be logged in.
- User must be in the Food Log View.
- User must have successfully searched for a food item.
- User has less than 20 food items added to the Food Log in the past 24 hours.

Required Input:

- User selects the Add option near the food item.
 - User selects from a dropdown list the portion size of the food item.
- *Portion size is measured in grams.

Successful Postconditions:

- Food Log is updated to reflect newly added meals under a category.
- Food Log is incremented by 1.

- User is notified with a confirmation message that the food item has been successfully added.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from the food search before selecting a food item.
- 2- User abruptly exits during the add process.

Failure Handling:

- 1- System exits the user from the search.
- 2- User must confirm whether they want to discard adding food to their Food Log.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Adding food item to the Food Log must take a maximum of 2 seconds.
- Food item must be accurate and match the one the user selected.
- Information regarding the food item must be accurate and verified.
- In case of any failure to add food item, user will be notified of the reason.

Custom Food Item

Functional Requirement:

System shall allow users to create custom food items that can later be added to their Food Log.

Preconditions:

- User must be logged in.
- User must be in the Food Log View.

Required Input:

- User selects the Custom Food Option.
- User must input the following details regarding the food item on the designated fields.
 - Name
 - The name has to be a minimum of 1 character and a maximum of 100.
 - Description

- The description ranges from 0-1000 characters.
- Calories
 - Must be an integer.
- Carbs in grams: optional and must be an integer.
- Protein in grams: optional and must be an integer.
- Fat in grams: optional and must be an integer.
- User selects the Add option.

Successful Postconditions:

- Food Log is updated to reflect newly added meals under a category.
- Food Log is incremented by 1.
- User is notified via confirmation message that the custom food item was added successfully.
- Database is updated.

Failure Scenarios:

- User abruptly exits from the custom food option.
- User attempts to keep required fields empty.
- User attempts to violate the guidelines of any of the fields.
- User abruptly exits from the custom food option during the add process.

Failure Handling:

- 1- System exits the user from the custom food option.
- 2- User will be notified to enter input for required fields.
- 3- User will be notified to follow the proper guidelines of the fields.
- 2- User must confirm whether they want to discard adding custom food to their Food Log.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Adding food item to the Food Log must take a maximum of 2 seconds.
- Food item must be accurate and match the one the user selected.
- In case of any failure to add food item, user will be notified of the reason.

Delete Food Item

Functional Requirement:

System shall allow users to delete food items from their Food Log.

Preconditions:

- User must be logged in
- At least one item must be in the Food Log.
- User must be in the Food Log View.

Required Input:

- User selects a category from the Food Log.
- User selects a food item from the category.
- User selects the delete option from the Food Item View.

Successful Postconditions:

- Food item is deleted from the category found in the Food Log.
- Update should be reflected in the Food Log View.
- Food Log is decremented by 1.
- User is notified and confirmation message is displayed stating that the food has been successfully deleted.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from the Food View after selecting the delete option.

Failure Handling:

- 1- User is notified to confirm whether they want to delete the food item before exiting.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.

- The deletion process must take a maximum of 2 seconds.
- Deleted food item must be the correct item the user selected.
- In case of failure to delete food item, user will be notified of the reason. `

Counting Calories

Functional Requirement:

System shall display to users details regarding their calorie intake and their progress towards their goals.

Postcondition:

- User must be logged in.
- User must be in the Calorie Counter View.

Required Input:

System retrieves user inputted data from Weight Management and Food Log.

System retrieves the user's personal data from their profile.

Successful Postconditions:

- The following calculations are made and displayed to the User:
 - User's recommended daily calorie intake.
 - User's total calories eaten.
 - User's remaining available calories.
 - User's surplus or deficit in calories.
 - User's average amount of calories accross the week.
- Feedback regarding their eating habits and whether they are on track with their goals.

Failure Postconditions:

All successful postconditions fail and the user will be notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Display of calorie calculations and feedback must take a maximum of 3 seconds.
- Data being displayed to the user must be accurate and calculations must match with the data they inputted.
- User will be notified if the daily calorie intake requirement to reach their weight goal is deemed as unhealthy officially by the Ministry of Health.

- In case of failure to display calculations and feedback, user will be notified of the reason.

Export Food Log

Functional Requirements:

System shall allow users to export their Food Log onto their mobile devices or desktops.

Preconditions:

- User must be logged in.
- User must be in the Food Log View.

Required Input:

- User selects Export Food Log Option.

Successful Postconditions:

- Food log is exported to the user's chosen destination.
- User is notified via confirmation message that the export food log was exported successfully.

Failure Scenarios:

- 1- User abruptly exits the Food Log View before the export request is completed.

Failure Handling:

- 1- User is notified to confirm whether they want to export before exiting.

Failure Postconditions:

Food log is not exported and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Exporting Food Log process must take a maximum of 3 seconds.
- No data will be leaked during the export process. (?)
- Exported Food Log must be accurate and match the one the user selected.
- In case of any failure to export Food Log, user will be notified of the reason.

6- Track Records

Search Records

Functional Requirements:

System shall allow users to search for an existing record.

Preconditions:

- User must be logged in.
- User must be in the Track Records View.
- At least 1 record must exist.

Required Input:

- User selects the Search Record option.
- User enters the following information in the designated fields:
 - Name or Date of an existing record.
 - Date Syntax: MM-DD-YYYY

Note: As user types, the search bar will show files that match the user's input.

- User selects a record.
 - User will be redirected to the Record View of the selected record.

Successful Postconditions:

- Track Record View displays valid searched records.
- User has the option to view the selected record.
- Misspelling a record name returns 0 results.
- Inputting incorrect date returns 0 results.

Failure Scenarios:

- 1- User abruptly exits the track Records Search option before submitting.
- 2- User abruptly exits the Track Records View before the search is completed.
- 3- User attempts to violate the naming guidelines of a record by inputting a name exceeding the maximum character limit or by leaving it empty.

4- User attempts to violate the date guidelines of a record by inputting a different syntax.

Failure Handling:

1- System will abort the medication search request.

2- User must confirm whether they want to leave the Record Search request.

3,4- User will be notified to follow the proper guidelines for inputting name/date of record.

Failure Postconditions:

All postcondition fails and the user will be notified.

Nonfunctional Requirement:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- It must take a maximum of 3 seconds to conduct the search.
- Data being displayed must be accurate and match the search made by the user.
- In case of any failure to display results, user will be notified of the reason.

Categorize Records

Functional Requirements:

User will be able to categorize existing medical or nutritional records into folders.

Preconditions:

- User must be logged in.
- User must be in the Track Records View.
- User performed a successful record search.

Required Input:

- User selects the Create Folder option.
- User enters the following information in the designated fields:
 - Category Name:
 - Name must range between 1-100 characters.

- No two folders can have the same name.
- User selects the Add Record to Folder option.
- User selects a record returned from the search request.
 - User may select multiple records at a time within a search.
 - User may start a new search and add those records into the folder.

Successful Postconditions:

- Category is created.
- Existing files are categorized into folders the user created.
- The user is notified with a confirmation message that the records were successfully categorized.
- Database is updated.

Failure Scenarios:

- 1- User attempts to violate the proper search records guidelines (refer to Search Records subfeature)
- 2- User abruptly exits before completing the create folder request.
- 3- User abruptly exits in the process of adding records into the folder.

Failure Handling:

- 1- User will be notified to follow the proper guidelines for inputting the name/date of record.
- 2- System will abort the create folder request.
- 3- User will be notified to confirm whether the selected record(s) should be added or not to the folder before exiting.

Failure Postconditions:

Successful postcondition fails and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- The create category process must take a maximum of 2 seconds.
- Adding/Removing files to the folder should take a maximum of 2 seconds.
- Created folder must match the user's inputted data.

- Data being added/removed to the folder must be accurate and match the one the user selected.
- Data is secure and will not be leaked during the categorization process.
- In case of any failure to create a folder or add/remove records to it, user must be notified of the reason.

View Folder

Functional Requirement:

System shall allow users to view the content of the folder.

Preconditions:

- User must be logged in.
- User must be in the Track Records View.
- Folder must exist.

Required Input:

- User selects the folder.
 - User is redirected to the Folder View.

Optional Input:

- User may select the sort results option:
 - Files are sorted either alphabetically or chronologically.
 - User's order preference will be saved for future searches.
- User may select a specific record:
 - User is now redirected inside the record in Record View.
- User may select the search option:
 - Must follow the search record guidelines (Refer to Search Records subfeature)
 - User inputs valid name or date of a record in the folder.

As user types, search bar will show files that match the user's input.

Successful Postconditions:

- User is able to view the contents of a folder.
- User is able to sort the records of a folder.
- User is able to view a specific record.
- User is able to search for the records in a folder.

Failure Postconditions:

All functional requirements fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- The filtering process must take a maximum of 3 seconds.
- The redirecting process from Folder View to Record View must take a maximum of 3 seconds.
- Data being displayed must be accurate and match the one the user selected.
- In case of any failure to view folder, user will be notified of the reason.

7- Diet Recommendations

Create Diet Recommendation

Functional Requirements:

System allows users to create personalized diet plans.

Preconditions:

- User must be logged in.
- User information is retrieved.
- User must be in the Diet Recommendations View.
- 10 dietary questions are displayed to the user.

Required Input:

- User selects answers to all the given questions.
 - These answers are used to help generate accurate meals based on the user's preference.
 - Depending on the question, the user may select more than one answer.

Optional Input:

- User selects the filter option to filter the Diet Recommendations based on a certain criteria.
 - Timing (breakfast, lunch, etc).
 - Level of difficulty (easy, moderate, hard)
 - Food Components (vegetarian based, fish based etc)

Successful Postconditions:

- Search displays meals and recipes based on the user's answers to the questionnaire.
- A maximum of 30 meals will be displayed at a time, but user can query more if they would like to.
- 5 queries can be displayed per minute.
- User may filter the displayed results.
- Search cannot return 0 results.
- User is notified via confirmation message that the Diet Recommendation Plan was created successfully
- The diet recommendation plan is updated in the database.

Failure Scenarios:

- 1- User abruptly exits the Diet Recommendations View before submitting the answers of the questionnaire.
- 2- User does not answer all the questions.
- 3- User abruptly exits before the personalized meals are generated.

Failure Handling:

- 1- System aborts the Create Diet Recommendation request.
- 2- User will be notified to answer all questions of the questionnaire.
- 3- User must confirm whether they want to leave the Personalized Meals generating process.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Recommended recipe and meal list must be generated at a maximum of 5 seconds.
- Filtering the list must take a maximum of 2 seconds.
- Data being displayed must be accurate and match the search made by the user.
- In case of any failure to display results, user will be notified of the reason.

View Details of Recommended Meals

Functional Requirement:

System shall allow users to view details of a meal/recipe from the generated personalized list.

Preconditions:

- User must be logged in.
- User must be in the Diet Recommendations View.
- User is displayed a list of menu/recipe recommendations.
- Search generates at least 1 result.

Required Input:

- User selects a meal from the Diet Recommendations View.

Successful Postconditions:

- User is redirected to the Meal View.
- Details of the selected meal are displayed to the user.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Displaying meal details must take a maximum of 2 seconds.
- Meal item details must be accurate and match the one the user selected.
- In case of any failure to view meal item, user will be notified of the reason.

Add Meal to Meal List

Functional Requirement:

System shall allow users to add meals onto their Meal List.

Preconditions:

- User must be logged in.
- User must be in the Diet Recommendations View.
- User is displayed a list of menu recommendations.

- Meal list contains less than 5 meals in 24 hours.

Required Input:

- User selects a meal from the displayed list in the Diet Recommendations View.
- User selects the add option found in the Meal View.
- User must confirm adding the meal to the meal list.

Successful Postconditions:

- Meal list is updated to reflect the newly added meal.
- User is notified with confirmation message that the meal was added to Meal List successfully.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from the Diet Recommendations View before selecting a meal.
- 2- User abruptly exits from the Meal View during the adding process.

Failure Handling:

- 1- System exits the user from the Diet Recommendations View.
- 2- User must confirm whether they want to discard adding meals to the meal list or to stay.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- The adding meal to meal list process must take a maximum of 2 seconds.
- Added Meal item must be accurate and match the one the user selected.
- In case of any failure to add meal item, user will be notified of the reason.

View Meal List

Functional Requirement:

System shall allow users to view their Meal List.

Preconditions:

- User must be logged in.
- User must be in the Diet Recommendation View.

Required Input:

User must select the View Meal List option.

Optional Input:

User may select a meal in their Meal List.

Successful postconditions:

- Meal List is displayed to the User.
- A maximum of 5 meals are on the list per day.
- Selecting a meal displays its details by redirecting the user to the Meal View of that selected meal.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- It must take a maximum of 2 seconds to display the Meal List.
- Selecting a meal must take a maximum of 2 to redirect the user from Meal List View to Meal View.
- Meal item details must be accurate and match the one the user selected.
- In case of any failure to view meal item details, user will be notified of the reason.

Delete Meal from Meal List

Functional Requirements:

System shall allow users to delete a meal from their meal list.

Preconditions:

- User must be logged in.
- User must be in the Meal List View.

- Meal list must currently has at least one meal added to it.

Required Input:

- User selects the meal.
 - User selects the delete option.
 - User confirms deleting the meal from their meal list.

Successful Postconditions:

- Meal is deleted from the Meal List.
- Meal List is decremented by 1.
- Meal List View is updated.
- The user is notified with a confirmation message that the meal was successfully deleted from the Meal List.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from the Meal View after selecting the delete option.

Failure Handling:

- 1- User is notified to confirm whether they want to delete the meal before exiting.

Failure Postconditions:

All successful postconditions fail and the user will be notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Redirecting user from Meal List View to Meal View should take a maximum of 2 seconds
- The deletion process of a meal must take a maximum of 2 seconds.
- Deleted meal item must be accurate and match the one the user selected.
- In case of any failure to delete meal item, user will be notified of the reason.

8- Hot Topics

View Hot Topic

Functional Requirements:

System shall allow users to access a hot topic and view its content.

Preconditions:

- Users must be logged in.
- User must be in the Hot Topic View.

Required Input:

- User selects the Hot Topic Search option.
- User enters the following information in the designated fields:
 - Zip Code:
 - The zip code is 5 characters.
 - User can only change zip codes once every 10 seconds

*Note: If the user does not have a zip code they must input the nearest one to their location.

- Optional Input:
 - User can filter the search based on the type of hot topic.

Successful Postconditions:

- Hot Topics displays all important health events nearby the user.
- Hot Topics can return 0 events.
- Hot Topic will return a maximum of 50 topics ordered by the most recent to least recent filtered by category.

Failure Scenarios:

1. User abruptly exits the Hot Topic View.
- 2- User attempts to input invalid zip code where:
 - Zip code does not exist.
 - Zip code contains non-integer characters.

Failure Handling:

1- System will abort the Hot Topic Search request.

2- User will be notified to enter a valid zip code.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- It must take a maximum of 3 seconds to conduct the search.
- Data being displayed must be accurate and match the search made by the user.
- In case of any failure to display results, user will be notified of the reason.

Opt-in Notifications

Functional Requirement:

System shall allow users to be notified of new topics surrounding their area.

Preconditions:

- User must be logged in.
- User must be in the Hot Topics View.

Required Input:

- User selects the Opt-In Notifications Option.
- User must confirm the zip code to receive notifications based on.
- User must confirm their choice to receive notifications.

Successful Postconditions:

User receives emails of new topics happening in their area every 48 hours.

Failure Scenarios:

- User abruptly exits from the Hot Topic View before confirming their Opt-In Notifications choice.

Failure Handling:

- System will force the user to confirm before exiting from the Hot Topic View.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Opt-in notifications and an email being sent should take a maximum of 5 seconds.
- User must receive the notification at the exact set date and time.
- Only the system administrator can view the user's verified email.
- In case of any failure of opt-in notifications, user will be notified of the reason.

Core Components

Note:

In the document provided in [Core Requirements](#), we have used some contents in there to aid us in our BRD: BitOHealth.

Security

Authentication

Functional Requirement:

System shall validate user.

Preconditions:

- User must be in Login view.
- User must have an existing account.
- User must not already have an active authenticated session.

Required Input:

- User enters the following information in the designated fields:
 - Valid Email Address.
 - Valid OTP:
 - Must consist only of a-z, A-Z, 0-9
 - Changes with every successful use.
 - Expires every 2 minutes.
 - A minimum of 8 characters.

Requirements:

- Each account has a maximum of 5 failed authentication attempts every 24 hours before their account gets disabled and locked.
- After 24 hours, fail count resets to 0.
- Account recovery must be performed by System Administrator.
- Once account recovery is successful, fail count resets to 0.
- Every failed authentication attempt will be logged by the system.

Successful Postconditions:

- User successfully logs in.
- User is redirected to the user's Home Page.
- User is notified of invalid email/password/OTP with every failed login attempt.
- User is notified of last attempt before account is disabled and locked.
- If user's account is disabled, user is notified to contact System Administrator for account recovery.

Failure Scenarios:

- 1- User abruptly exits from the Authentication.
- 2- User attempts to leave any required fields empty.
- 3- User inputs invalid Email Address.
- 4- User attempts to input invalid OTP.
- 5- User is not notified of invalid login attempt.
- 6- User is not notified of disabled account and to constant System Administrator.
- 7- Failed attempts are not logged by the system.
- 8- User successfully inputs valid credentials but still unable to log in.

Failure Handling:

- 1- User aborts authentication.
- 2- User is notified to input all required fields.
- 3,4- User is notified of invalid email address/password/OTP and to follow the proper guidelines.

Failure Postconditions:

All successful preconditions fail and user is notified.

Nonfunctional Requirements:

- Authentication process must take a maximum of 3 seconds.
- After successfully logging in, user must be redirected to user's Home Page in a maximum of 3 seconds.
- Only the System Administrator can view the user's verified email.
- Data must match the user's inputted data.
- Data is secure and will not be leaked during the authentication process.

- In case of any failure to authenticate user, user must be notified of the reason.

Authorization

Functional Requirement:

System shall limit access to specific resources to only valid,authorized users.

Preconditions:

- User's account must exist.
- User must be authenticated.

Requirements:

- Only authorized users will have access to protected resources.
- System prevents unauthorized users from accessing, viewing, or interacting with protected resources.
- Every attempt to access protected resources will be logged by the system.
- Every authorization fail will be logged by the system.

Successful Postconditions:

- User is granted access to any authorized functionalities.
- User is granted access to any authorized data.
- User is granted the ability to perform read/write options on the appropriate data.
- User is only able to access data/functionalities and perform operations within their authorized scope.
- Difference in authorized scope and privileges between regular users and System Administrators must be apparent.

Failure Scenarios:

- 1- Unauthorized user is granted access beyond their scope.
- 2- Authorized user is not granted access to data/operations within their scope.
- 3- System administrator and regular users share the same role and privileges.

Logout

Functional Requirement:

System shall allow users to end a logged in session.

Preconditions:

- User must have an existing account.

- User must be logged in.

Required Input:

- User selects the Logout option.

Successful Postconditions:

- A message is displayed to the user to confirm whether they are sure to logout.
- User is logged out and the active session ends.
- User may log out whenever they want during an active session.
- The user will be redirected to the system's Home Page.
- A confirmation message is displayed stating that they have successfully logged out.
- Log out will be logged by the system.

Failure Scenarios:

- 1- User abruptly exits from the Logout request.
- 2- User is not logged out and session remains active.
- 3- User is not redirected to the system's Home Page.
- 4- No confirmation message is displayed to the user.
- 5- Logout is not logged by the system.

Failure Postconditions:

All successful preconditions fail and user is notified.

Nonfunctional Requirement:

- The logout process must take a maximum of 5 seconds.
- User must be redirected to the system's Home Page in a maximum of 3 seconds.
- In case of any failure to log out, user must be notified of the reason.

Login

Functional Requirement:

System shall allow users to access their existing accounts.

Preconditions:

- User's account must exist.

- User must be in the Login view.

Required Input:

- User selects the Login option.
- User enters the following information in the designated fields:
 - Valid email address or username.
 - Valid password.
 - Valid authentication code.

Successful Postconditions:

- User is notified that the login was successful.
- User is successfully logged in to their account.
- User is redirected from Login Page to user's Home Page.
- Login is logged by the system.

Failure Scenarios:

- 1- User abruptly exits from the login request.
- 2- User attempts to leave any required fields empty.
- 3- User enters invalid email.
- 4- User enters invalid password.
- 5- User enters valid credentials but is still unable to log in.
- 6- Login is not logged by the system.

Failure Handling:

- 1- System aborts the request.
- 2- User will be notified that input is required.
- 3,4- User will be notified to re-enter a valid email/password.
- 3,4- User will be allowed 5 attempts to input a password before the account's email is temporarily disabled for login.

- If user continues to input an invalid password, account will be locked and user will be notified to contact system administrator.
- Only system administrators will be able to unlock the account.

Failure Postconditions:

- All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- Login process must take a maximum of 3 seconds.
- Redirecting user from Registration view to user's Home Page must take a maximum of 3 seconds.
- In case of any failure to login, user must be notified of the reason.

Reset Password

Functional requirements:

System shall allow users to reset their password.

Preconditions:

- User's account must exist.
- User must be in the Login view.

Required Input:

- User selects the Reset Password option.
 - A reset password email will be sent to the user.
- User selects the link in the reset password email.
- User re-inputs a password which follows the proper guidelines.
- User confirms new password.

Successful Postconditions:

- User is notified to check their email for the reset password instructions.
- After successfully completing instructions, user is notified that the password has been successfully reset.

- Password is successfully reset.
- Database is updated.
- User is redirected to the Login Page.

Failure Scenarios:

- 1 - User abruptly exits from the Reset Password request.
- 2- No message is displayed to the user to check their email for password reset.
- 3- No password reset email is sent to the user.
- 4- User does not complete the instructions.
- 5- User inputs an invalid password.
- 6- Password is not reset.

Failure Handling:

- 1- System aborts the request.
- 4- User will not be able to reset password.
- 5- User will be notified to enter a valid password that follows the proper guidelines.

Failure Postconditions:

- All successful postconditions fail and user is notified.

Nonfunctional Requirement:

- Reset password process must be simple for the user to understand and follow.
- Resetting password must take a maximum of 2 seconds.
- Redirecting user to the Login view must take a maximum of 3 seconds.
- Password must be accurate and match the user's inputted data.

User Administration

Account Creation (Registration)

Functional Requirement:

System shall allow users to create a new user account.

Preconditions:

- User must be at the Registration view.
- User must not be a System Administrator.

Required Input:

- User selects the Registration option.
- User enters the following information in the designated fields:
 - Email Address:
 - Email address must be valid, maximum 255 characters, and in email format.
 - Example: (name@domain)
 - Email address must be unique, not associated with any existing account in the system.
 - Password:
 - Password must be a minimum of 8 characters and a maximum of 30 characters.
 - Password must consist of only valid characters:
 - a-z, A-Z, 0-9, ., @!
 - Password must consist of at least one uppercase letter, lowercase letter, a number, and a special character
 - An option to temporarily display the password.
 - Reenter Password:
 - Must match that was entered in the password field.

Successful Postconditions:

- System sends a confirmation email to the user that is only valid for 24 hours.
- A message is displayed to the user notifying them of the confirmation email.
- After completion of confirmation email, user is provided with a username that is associated with his account.
 - Username will consist of:
 - 7-15 characters.
 - a-z,A-Z,0-9, ., @!
- A message is displayed to the user confirming that the account has been successfully created.
- An account has been successfully created and saved to the system.
- User is taken to the user's Home Page.
- User Analysis Dashboard is updated.
- Logging is updated.
- Database is updated.

Failure Scenarios:

- 1- User abruptly exits from the registration request.
- 2- User attempts to leave any of the required fields empty.
- 3- User inputs an invalid email (nonexistent/already associated with an account)
- 4- User inputs an invalid password (does not follow the requirements)
- 5- No message regarding the confirmation email is displayed to the user.
- 6- User does not receive a confirmation email after submitting request.
- 7- User does not complete the confirmation email.
- 8- User is not provided with a username.
- 9- No message is displayed to the user confirming the account has been successfully created.
- 10- User is not taken to the user's Home Page.
- 11- Account is not created and saved.
- 12- Database is not updated.

Handling Failure Scenarios:

- 1- System aborts the request.
- 2- User will be notified that input is required.
- 3,4- User will be notified to follow the proper guidelines for inputting the email and creating a password.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- Registration process will be simple to understand for all users.
- After user completes all requirements, registration process must take a maximum of 5 seconds.
- Redirecting user from Registration view to user's Home Page must take a maximum of 3 seconds.

- Confirmation email must be sent to the user 15 seconds within submitting the request.
- Only the system administrator can view the user's verified email.
- Created account must match the user's inputted data.
- In case of any failure to create account, user must be notified of the reason.
- No data will be leaked during the process.

Account Recovery

Functional Requirement:

System shall allow users to regain access to their inactive or active account.

Preconditions:

- Account must exist.
- User must not have an active authenticated session on device.
- User must be in the Account Recovery view.
- User must have at least 1 account recovery request available.

Required Input:

- User selects the Recover Account option.
- User enters the following information in the designated fields:
 - Valid username.
 - Valid email.

Successful Postconditions:

- User is notified that an account recovery email has been sent to them.
- System sends user an email containing a recovery URL link.
- Recovery URL link must be used within 24 hours of receiving it.
- Up to 5 account recovery requests can be made every month by a user.
- Account recovery is completed and user now has access to their account.
- User is notified that the account has successfully been recovered.

Failure Scenarios:

- 1- User abruptly exits from the Account Recovery request.
- 2- User inputs invalid username and/or email.
- 3- User leaves one of the required fields empty.
- 4- User inputs all the required fields, but no account recovery email is sent to them.
- 5- Account recovery email is sent too late.
- 6- User receives account recovery email, but does not click the link.
- 7- User receives account recovery email, clicks the link, and account is not recovered.

7- User receives account recovery email, clicks the link, and incorrect account is recovered.

8- Recovery email does not expire after 24 hours.

9- Recovery email expires before 24 hours.

Failure Postconditions:

All successful postconditions fail and the user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the view.
- View is loaded within 15 seconds from when the user accesses the page.
- Account Recovery email must be sent to the user within 15 seconds.
- Accurate data is being displayed to the user.
- Accurate account is successfully recovered.
- In case of any failure to recover account, user must be notified of the reason.

Account Deletion

Functional Requirement:

System shall allow any user to delete their account or system administrator to delete existing accounts.

Preconditions:

- Account must exist.
- User must be logged in.
- User must be in the Account Deletion view.
- User must be authorized to delete account.

Required Input:

- User selects the Delete Account option.
- User must confirm this action.

Successful Postconditions:

- System displays a confirmation message to the user.
- User is redirected to the Home View of the application.
- All information regarding the user is permanently deleted from the system.
- Database is updated.
- Delete action is irreversible and cannot be recovered.
- User Analysis Dashboard is updated.
- Logging is updated.

Failure Scenarios:

- 1- User abruptly exits from the Delete Option.
- 2- User selects the delete option and does not have to confirm the action.
- 3- User successfully deletes account but still not redirected to the Home View.
- 4- User successfully deletes account but no confirmation message is displayed.
- 5- Data regarding the user is still stored in the system and database.
- 6- Incorrect account is deleted from the system.
- 7- Unauthorized user has access to deleting any account in the system.

Failure Postconditions:

All successful postconditions fail and user is notified.

Nonfunctional Requirements:

- User must have easily navigated to the User Management view.
- View is loaded within 15 seconds from when the user accesses the page.
- Operation must be completed within 5 seconds of invoking it.
- Accurate information must be displayed to the user and the correct account must be deleted from the system.
- In case of any failure to delete account, user must be notified of the reason.

User Management

Functional Requirement:

System shall allow for administration of any user account.

Preconditions:

- User must have an active authenticated session.
- User must be on User Management view.
- User must be a System Administrator.

Successful Scenarios:

- System administrator will be given the option to perform any of the following operations on existing user accounts:
 - Create, Update, Delete, Disable, and Enable Accounts.
- System administrator will be able to perform bulk operations which should affect all users in the system.
- A message will be displayed to the System Administrator upon successfully completing an operation.
- An error message will be displayed to the System Administrator in case of any failure to complete an operation.

- System Administrator successfully completes any operation in a timely manner.

Failure Scenarios:

- 1- System Administrator abruptly leaves the view.
- 2- System Administrator is unable to access the view.
- 3- System Administrator is unable to perform operations.
- 4- System Administrator successfully performs operations, but system does not update to reflect changes.
- 5- No message is displayed to the System Administrator after completing an operation.
- 6- No error message/wrong error message is displayed to the System Administrator when failing to complete an operation.
- 7- Operations are not performed in a timely manner.
- 8- Unauthorized user has access to the view.

Failure Postconditions:

All successful postconditions fail and user is notified.

Nonfunctional Requirements:

- System Administrator must have easily navigated to the User Management view.
- View is loaded within 15 seconds from when the System Administrator accesses the page.
- Operation must be completed within 5 seconds of invoking it.
- Bulk operation must be completed within 60 seconds of invoking it.
- User information is kept secure and private.
- In case of any failure to display data or perform an operation, System Administrator must be notified of the reason.

System Observability

User Analysis Dashboard

Functional Requirement:

System shall create a visual representation of user behavior for gaining insight.

Preconditions:

- Persistent data store must be active.
- Persistent data store must be accessible by the system.
- User must have an active authenticated session on the device.

- User must be on Usage Analysis Dashboard view.
- User must be a System Administrator.
- Data is fetched from Data Store.

Successful Postconditions:

- System displays data on user interaction within the system:
 - Bar chart regarding the top 5 most visited views and top 5 average duration per view.
 - Trend chart that spans 3 months regarding the number of logins per day and the number of registrations.
 - Total number of accounts registered to the system.
 - Number of accounts currently logged in.
- Data is automatically updated every 1 minute.

Failure Scenarios:

- 1- System administrator is unable to access User Analysis Dashboard view.
- 2- System fails to display all data regarding the current state of the system.
- 3- System displays inaccurate/outdated data regarding the current state of the system.
- 4- Data is not automatically updating in a timely manner.

Failure Postconditions:

All successful postconditions fail and user is notified.

Nonfunctional Requirements:

- System Administrator must have easily navigated to the User Analysis Dashboard view.
- View is loaded within 15 seconds from when the System Administrator accesses the page.
- Data being displayed must be accurate and updated.
- View must be easy to understand and follow by the System Administrator.
- User information is kept secure and private.
- In case of any failure to display data, System Administrator must be notified of the reason.

Logging

Functional Requirement:

System shall be able to track all events by saving them to the database for auditing.

Preconditions:

- System administrator is in the Logging view.
- Persistent datastore must be active.
- Persistent datastore must be accessible by the system.
- Persistent data store must have enough storage capacity for log entry.
- System Administrator must be in the Logging view.

Successful Postconditions:

- System logs system and user success events.
- System logs system and user failure events.
- Every active session, system logs user:
 - Login
 - Logout
 - Pages accessed
 - Operation performed during every page access.
- Information regarding every log entry will be recorded:
 - Timestamp in which it occurred.
 - Log Level.
 - Operation performed.
 - Category.
 - Description of log entry.
- All logs will be saved to the datastore.
- Logging continuously happens as long as the web application is active.
- Logging does not block anyone from using the web application.
- Logged entries may be modified.

Failure Scenarios:

- 1- System fails to log system and user success events.
- 2- System fails to log system and user failure events.
- 3- System fails to log information regarding the log entry.
- 4- Logs are not saved to the datastore.
- 5- Logging is not consistent.
- 6- Logging blocks users from using the web application.

7- Unauthorized user has access to the Logging view.

Failure Postconditions:

All successful postconditions fail and user is notified.

Nonfunctional Requirements:

- The logging process must take a maximum of 5 seconds from the time it was invoked.
- Data being saved to the data store must be accurate.
- In case of any failure to log entries, System Administrator must be notified of the reason.

Archiving

Functional Requirement:

System shall be able to offload all log entries within the system.

Preconditions:

- Persistent datastore must be active.
- Persistent datastore must be accessible by the system
- Destination must have enough storage.
- System Administrator must be in Archiving View.

Successful Postconditions:

- Archiving takes place on the 1st of every month at exactly midnight.
- Log entries older than 1 month will be archived.
 - Log entries include:
 - System and user success events.
 - System and user failure events.
 - Login/Logout events.
 - Pages accessed.
 - Operation performed during every page access.
- System administration may access and view archived log entries.
- Archived logs are deleted from the system.
- Database is updated.

Failure Scenarios:

1- System fails to archive log entries in a timely manner.

- 2- System fails to archive accurate log entries.
- 3- System administrator is unable to access or view archived log entries.
- 4- System fails to archive logs to the correct location.
- 5- Archived logs still remain within the system.
- 6- Unauthorized user has access to Archive view.

Failure Postconditions:

All successful postconditions fail and user is notified.

Nonfunctional Requirements:

- The archiving process must take a maximum of 1 minute from the time it was invoked.
- Data being archived must be accurate and sent to the accurate location.
- In case of any failure to archive, System Administrator must be notified of the reason.

Universal Requirements

Error handling

Functional Requirement:

System shall be able to prevent failures from causing the system to fail or go offline for any user.

Successful Conditions:

- Notify users of all frontend errors
- Notify users of system failure during backend errors.
- Notify administrators of all backend errors.
- Handle errors without any data loss.
- Recover from errors/failures from a defined RPO or RTO.
- Tolerate the following:
 - Client and Server failures.
 - Client and Server power outages.
 - Client and Server network interruptions.
- Must notify users and handle errors quickly to prevent confusion.

System must not crash or become unresponsive.

System must not go offline.

Recovery must be swift and error handling must not drastically impact users.

Failure Conditions:

- User is not notified of any occurrence of an error.
- User is notified of the wrong errors.
- System administrator is not notified of any occurrence of an error.
- System administrator is notified of the wrong errors.
- Data is lost during error handling.
- Error is not recovered from a defined RPO or RTO.
- Errors take long to notify users or System Administrators.
- Errors result in system failure and for the system to go offline.
- Error handling is not fast and smooth causing the user to feel frustrated and leave the site.

UI/UX

Functional Requirement:

System shall provide an interface for users to interact with the application.

Successful Conditions:

- Simple and easy to interact with and navigate through.
- Formatted and structured in a clear and consistent manner.
- Text must be in the user's preferred language.
- Strong visual hierarchy.
- System messages must be displayed within 5 seconds.
- System failures must be displayed and resolved in a timely manner to prevent users from getting frustrated and leaving the application.
- System failures must not cause the system to go offline or crash.

Failure Conditions:

- Confusing and difficult to interact with and navigate through.
- Frustrates user and causes them to become unsatisfied and leave the application.
- Unstructured, unclear, and inconsistent formatting.
- Weak visual hierarchy.
- System is in a different language from the user's preferred option.
- System messages are displayed too slow.
- System failures take too long to resolve.
- System failures cause the system to go offline or crash.

