
Software Requirements Specification

for

BabyBites

Version 1.0 approved

**Dan Ledwith, Dominique Willis, Martin Salisbury,
Asia Acosta, Cameron Williams, Diogo Silva**

Old Dominion University

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1. Introduction

This section is an introduction to the BabyBites application. It outlines its goals, purpose, and scope.

1.1 Purpose

This document provides detailed specifications and requirements for BabyBites, a web-based application to assist parents and caregivers in making feeding transitions for their children.

1.2 Scope

BabyBites is a mobile-first web application which has been designed to assist the parents, guardians, and caregivers of children who are in the phase of transitioning from liquids to solid foods. The goal of this application is to provide aid, advice, and guidance for those who are going through this change with their child and allow them to navigate it with ease. BabyBites simplifies the planning of meals as well as feeding decisions in conjunction with personalized profiles, food trackers, nutritional guidance, and milestone and progress alerts.

BabyBites utilized expert-back resources, and supports both safe and balanced nutrition through the use of allergy and choking hazard warnings, and tips for the preparation and serving of meals. Reducing stress, uncertainty, and other feelings of worry and anxiety, while simultaneously promoting healthy eating patterns and habits, is one of the main objectives of BabyBites.

1.3 Definitions, Acronyms, and Abbreviations

Baby Profile - A user-created profile to categorize their children within the application.

Daily Report - A summary of user milestones and pertinent information regarding their child (i.e. food consumption, milestones, allergies).

Dashboard - The home page of the user. It features shortcuts to relevant pages and displays daily reports.

Filter - A sorting function that will allow specific items to be displayed based on input.

Food Database - A comprehensive database that allows users to look up various food, view nutritional information and access preparation tips.

Food Tracker - A log the user can modify to maintain a history of foods given to the child.

FoodData Central API - USDA's database for food that will be used as a source of information for the BabyBite's food datatable.

IDE (Integrated Development Environment) - A software application, such as VSCode, that provides tools for writing, testing, and debugging code.

Notification - An alert that will notify the user of important information (i.e. allergies, choking hazards).

Search - BabyBites' food searching feature.

User - Any person who has created an account and utilizes the application.

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1.5 Overview

The remaining sections of this document are divided into two main parts: Overall Description and System Requirements. Section 2 of this document provides a brief overview of BabyBites. Section 3 contains the specific requirements, organized by feature.

2. Overall Description

An overview of the BabyBites system is provided in this section, describing its functionality, general features, the intended users of the application, the environment in which it operates, and overall, the context of the BabyBites application.

2.1 Product Perspective

BabyBites is a mobile-first web application that has been created to aid and give parents, guardians, and caregivers the support they need when their young child is transitioning from liquids to solid foods. Acting as an interactive assistant when it comes to feeding and meals for the transitioning children, BabyBites simplifies meal tracking, provides nutritional guidance, and promotes and facilitates safe eating habits.

Data from FoodData Central API is integrated into the application to provide nutrition information and recommendations which are verified. BabyBites users have the ability to create personalized profiles for their child, log liquid (milk) and food intake, get alerts regarding milestones, and have direct access to the expert-backed feeding resources.

BabyBites is a stand-alone web application which was developed using React for the frontend, Django for the backend, and PostgreSQL for the storage of data. BabyBites is able to be accessed from any device which is connected to the internet and does not rely on any type of external hardware.

BabyBites aims to reduce the unknowns and uncertainties for parents, guardians, and caregivers which may come up during this transition and time period in a child's life. This is done through the offerings of structured guidance and advice, allergy and choking hazard alerts, as well as daily reports which allow caregivers to monitor the progress of their child.

2.2 Product Functions

The BabyBites application will provide necessary tools and information that are needed to help parents, guardians, and caregivers navigate through their child's transition from liquid to solid foods. Within the BabyBites application, there is a large emphasis on the reliable nutrition support, safety, and a friendly to use application.

BabyBites is functional through the following core features:

- Account Creation and Login
 - Users of BabyBites will have the ability to create and register for an account. Once an account has been created, they will be able to log in to access their data and information on their personal dashboard.
- Dashboard Navigation
 - The dashboard is the first thing that BabyBites users will see when they log into or open up the application. This is the main hub of the application and will provide users with quick access to their baby's profile, the food tracker and database, daily reports, and resources.
- Baby Profile Management
 - The baby profile management feature is where the user (the parent, guardian, or caregiver) can add or update information about their child such as their name, date of birth, and any allergies or food sensitivities the child may have.
- Food Tracker
 - This is where BabyBites users will be able to log their child's daily liquid (milk) and food intake. Here, they can also add notes to track any reactions or issues that occurred during feeding.
- Food Database
 - The food database is connected to the FoodData Central API. The database allows users to search among the collection of foods that are deemed baby-safe and see the nutrition value for that certain food.
- Daily Reports
 - Each day, a daily report will be automatically generated and it will summarize the feeding activities of the child for that specific day including the variety of foods, the frequency of meals and intake, and milestone notes.
- Library of Expert Resources
 - This is a library in which users will be able to find and access articles and resources that will help with and are related to nutrition for babies and young children, food preparation, introducing the use of utensils, and safe feeding practices.
- Alerts and Notifications
 - Various alerts and notifications will be sent out or appear on the user's screen which will regard possible choking hazards, allergens, and/or updates on milestone achievements.

2.3 User Characteristics

The BabyBites application is meant to be used by parents, guardians, and caregivers who are responsible when it comes to the feeding and nutritional needs of their infant or toddler aged child. BabyBites main users will have varying skills and experience when it comes to technology and caring for a child.

2.3.1 Primary Users

The primary users of BabyBites will be parents and guardians; these are the primary caregivers that are in charge of and responsible for managing their child's nutritional needs and meals. It is assumed that

most of the parents and guardians who are utilizing this application will have moderate experience with technology. They should be familiar with the basics of navigating the web as well as knowledge and experience from using other mobile applications. The goals and responsibilities that these users will have consist of the following:

- Tracking and logging liquid (milk) and food intake of the child
- Receiving various alerts about nutrition and allergy
- Monitoring the development of their child's feeding progress via feeding milestones
- Accessing expert-backed feeding and meal preparation resources

Secondary caregivers fall just below the primary users. This includes people, other than their parent or guardian, who are also very active in the child's life; babysitters, extended family members, nannies, teachers, etc. This group of people isn't around for all meal and feeding times, but they do help assist the parent or guardian of the child during daily feeding activities. This group of people have a ranging experience with technology, as the younger people will tend to be more technologically savvy and the older people may have a harder time using the technology in which BabyBites relies on. If there are some people who are having a hard time with the technological aspect of the application, it is important to encourage them to keep trying and push past the challenges they may be experiencing as it is something that can be taught and learned and will eventually become second nature; using the application is pretty straightforward once you know your way around it and start using it regularly. The goals and responsibilities that these users will have consist of the following:

- Accurately recording feeding activities
- Following the provided meal guidance and safety alerts
- Sharing data regarding feeding with primary caregivers

2.3.2 Administrative Users

The administrative users are essentially the administrators in charge of the system and BabyBites application. This is the group of authorized personnel and people who oversee the functionality of the system, along with the integrity of the data being used. The technological experience of this group of people is very high and advanced as they are responsible for all things related to maintaining the system. They are experts in the realm of framework for web development, database management, and cloud hosting environments. The goals and responsibilities that these users will have consist of the following:

- Managing all user accounts and permissions
- Maintaining and updating the food database (via FoodData Central API).
- Ensuring system security, reliability, and performance

2.4 Constraints

N/A

2.5 Assumptions and Dependencies

N/A

3. System Requirements

Section 3 is structured as follows:

- Section 3.1 will break down the system features.
- Section 3.2 will break down the performance requirements.
- Section 3.3 will break down the design constraints.
- Section 3.4 will break down the software system attributes .
- Section 3.5 will break down all other requirements.

3.1 System Features

3.1.1 Account Management

3.1.1.1 Introduction/Purpose of Feature

This feature allows a user to update the password associated with their BabyBites account. It ensures that users can maintain control over their account security by changing their credentials when needed. The feature verifies the current password before allowing the update and securely stores the new password using hashing. No other account modification or recovery functions are included here.

3.1.1.2 Stimulus/Response

Stimulus: A logged-in user submits their current password along with a new password.

Response: The system verifies the current password, updates the stored password to the new one (hashed), and confirms success to the user. If the current password does not match, an error is displayed.

3.1.1.3 Associated Functional Requirements

3.1.1.3.1 The user shall have the capability to change the password to their account. (*O:Ledwith*)

3.1.2 Login

3.1.2.1 Introduction/Purpose of Feature

This feature allows users to securely access their BabyBites account and associated data. It verifies user credentials, establishes a secure session, and ensures that only authorized users can view or modify their stored baby profiles and feeding records. This feature also includes mechanisms for password recovery and secure logout.

3.1.2.2 Stimulus/Response

Stimulus: The user enters a username and password and selects Log In.

Response: The system validates the credentials. If valid, a secure connection is created and the user is redirected to their dashboard.

Stimulus: The user enters incorrect login credentials.

Response: The system denies access and displays an error message indicating that the login attempt was unsuccessful without revealing which field was incorrect.

Stimulus: The user selects Forgot Password.

Response: The system initiates a password reset workflow via email to allow the user to create new credentials.

Stimulus: The logged-in user selects Log Out.

Response: The system terminates the session and redirects the user to the login screen.

3.1.2.3 Associated Functional Requirements

3.1.2.3.1 The user shall have the capability to log in to their account by entering their username and password. (O:Ledwith, M1:Willis)

3.1.2.3.2 The system shall validate login credentials and provide an error message if authentication fails. (O:Willis, M1:Ledwith)

3.1.2.3.3 The system shall maintain a secure session for the user after successful login. (O:Willis, M1:Ledwith)

3.1.2.3.4 The system shall provide a “Forgot Password” option for users to reset their credentials. (O:Willis, M1:Ledwith)

3.1.2.3.5 The system shall allow the user to log out securely at any time. (O:Willis, M1:Ledwith)

3.1.3 Baby Profile Management

3.1.3.1 Introduction/Purpose of Feature

This section outlines the requirements for the application's Baby Profile management system. It will encompass the user's ability to create, view, modify, delete, or select the active profile if multiple profiles exist.

3.1.3.2 Stimulus/Response

Stimulus: The user selects Create New Profile and submits required information (only a name and date of birth are required fields).

Response: The system validates the required fields (name and date of birth), creates the profile, and adds it to the user's profile list.

Stimulus: The user selects Edit Profile and updates one or more profile fields.

Response: The system validates and saves the updated attributes and refreshes the displayed profile information

Stimulus: The user selects Delete Profile for an existing profile.

Response: The system prompts for confirmation and, upon confirmation, permanently removes the profile and associated data.

Stimulus: The user selects a profile from their list to set it as the Active Profile.

Response: The system updates the session context to reflect the selected profile and applies it to feeding entries and daily reports.

3.1.3.3 Associated Functional Requirements

3.1.3.3.1 The system shall provide the capability for a user to create, view, edit, and delete one or more baby profiles. Each profile shall include the following attributes:

- Name - required for profile creation. (*O:Ledwith, M1:Silva*)
- Date of Birth - required for profile creation. (*O:Ledwith, M1:Silva*)
- Profile Image - optional. (*O:Ledwith, M1:Silva*)
- Known Allergies - optional; selected from a predefined list of allergies. (*O:Ledwith, M1:Silva*)

3.1.3.3.2 The system shall provide the capability for a user to switch between their baby profiles for the purposes of tracking food and viewing reports. (*O:Ledwith, M1:Willis*)

3.1.4 Food Tracking

3.1.4.1 Introduction/Purpose of Feature

This section outlines the requirements of the Food Tracker included in the web application. The food items being tracked will not be limited to just the item's name. The food tracker will also allow for quantity, date, time, and any additional information in the form of comment entry that the user desires.

3.1.4.2 Stimulus/Response

Stimulus: The user clicks on a drop-down menu and selects a food.

Response: The item is entered, but is not saved until the user saves the entry.

Stimulus: The user enters a quantity and clicks on a drop-down to select a unit of measurement.

Response: The quantity and its unit is entered, but is not saved until the user saves the entry.

Stimulus: The user can enter a note in the comment section or leave blank.

Response: The comment is entered (or left blank) until the user saves the entry.

Stimulus: The user clicks on save entry or discards their entry.

Response: If the user saves the entry it is stored in the database and the user remains on the current page. Otherwise the user discards the entry and remains on the current page.

3.1.4.3 Associated Functional Requirements

3.1.4.3.1 The user shall have the capability to record the feeding history of their child(ren), including date, time, food item, and quantity. (*O:Salisbury, M1:Willis*)

3.1.4.3.2 The system shall allow users to search for food items by name or food group using an integrated food database. (*O:Salisbury, M1:Willis*)

3.1.4.3.3 If a food item is not found in the database, the system shall provide an option for users to manually enter food items. (*O:Salisbury, M1:Willis*)

3.1.4.3.4 The system shall allow users to add comments to individual feeding entries. (*O:Salisbury, M1:Willis*)

3.1.4.3.5 The system shall associate each feeding entry with the current active baby profile. (*O:Willis, M1:Salisbury*)

3.1.4.3.6 The user shall have the capability to view, edit, and delete previous feeding entries from their child's feeding history. (*O:Willis, M1:Salisbury*)

3.1.5 Daily Reports

3.1.5.1 Introduction/Purpose of Feature

This section outlines the requirements for the application's ability to generate Daily Reports upon user request. Daily Reports will display aggregated data in the form of a PNG file that the user can view and download.

3.1.5.2 Stimulus/Response

Stimulus: The user selects a date to generate a respective Daily Report.

Response: A PNG image is generated for the date selected. If the date is current, then the data shown will consist of the entries made up until the time of report generation.

Stimulus: The user chooses to download the report.

Response: The report is saved to the desired location as a PNG file.

3.1.5.3 Associated Functional Requirements

3.1.5.3.1 The system shall generate a Daily Report for a selected baby profile and date consisting of the following attributes:

- The selected baby's full name. (*O:Ledwith, MI:Silva*)
- A chronological list of that day's entries showing time, food name, portion + unit, and any comments/reactions. (*O:Ledwith, MI:Silva*)
- Milestones achievements automatically generated from that day's inputs. (*O:Ledwith, MI:Silva*)
- Reminders automatically generated from that day's inputs. (*O:Ledwith, MI:Silva*)
- Options to share/export the report. (*O:Ledwith, MI:Silva*)
- Navigation to the previous/next day for the same profile. (*O:Ledwith, MI:Silva*)
- The system shall provide the capability to share or export the Daily Report in a downloadable format. (*O:Ledwith, MI:Willis*)

3.1.5.3.2 The system shall allow the user to navigate to the previous or next day's report for the same baby profile. (*O:Ledwith, MI:Willis*)

3.1.6 Food Database

3.1.6.1 Introduction/Purpose of Feature

This feature provides users with access to a centralized BabyBites food database containing a wide range of foods and their relevant nutritional information. The BabyBites database is maintained by system administrator and is sourced from the USDA FoodCentral database. Regular users do not directly access or query the USDA API. Users can search the BabyBites food database when logged in and can add custom foods if an item is missing. This ensures consistency, accuracy, and flexibility when recording feeding information.

3.1.6.2 Stimulus/Response

Stimulus: The user searches for a food by name or category.

Response: The system returns matching items from the BabyBites food database and any custom foods created by the user.

Stimulus: The user selects a food item from the results.

Response: The system displays the food's standardized nutritional values per 100 grams (calories, protein, carbohydrates, and fats).

Stimulus: A user wishes to add a food item that is not in the database.

Response: The system prompts the user to enter the food's name, category, and nutritional information, then stores the custom item in the user's food list.

Stimulus: An administrator searches the USDA FoodCentral API directly from a page restricted to administrators.

Response: The system retrieves and stores standardized nutritional data in the BabyBites food database for user access.

3.1.6.3 Associated Functional Requirements

3.1.6.3.1 The system shall allow users to search for foods by name and/or category from the BabyBites food database. (*O:Williams, M1:Ledwith*)

3.1.6.3.2 The system shall display nutritional values per 100 grams, including calories, protein, carbohydrates, and fats, for each food item. (*O:Williams, M1:Ledwith*)

3.1.6.3.3 The system shall allow administrators to import and update food data from the USDA FoodData Central API. (*O:Williams, M1:Ledwith*)

3.1.6.3.4 The system shall allow users to add custom food items by specifying the name, category, and nutritional information. (*O:Williams, M1:Ledwith*)

3.1.6.3.5 The system shall store USDA-sourced food data in the BabyBites database to enable quick user selection during meal logging. (*O:Williams, M1:Ledwith*)

3.1.7 Expert Resources

3.1.7.1 Introduction/Purpose of Feature

This section outlines the requirements for Expert Resources feature that provides the user with links to Expert-backed Resources that will aid the user by offering a supplemental means of information not found within the application.

3.1.7.2 Stimulus/Response

Stimulus: The user clicks on a link.

Response: The system will notify the user of being redirected off site.

Stimulus: The user acknowledges the pop up notification.

Response: If the user clicks okay and proceeds to the off site webpage. Otherwise the user cancels and remains on the current page.

3.1.7.3 Associated Functional Requirements

3.1.7.3.1 The system shall notify the user of being redirected to an off-site webpage to relevant resource materials, requiring acknowledgement before proceeding. (*O:Ledwith, MI:Acosta*)

3.2 Performance Requirements

3.2.1 Speed of Response

3.2.1.1 Page Loading Time

Pages shall load within 3 seconds on a normal 5G connection. (*O:Salisbury M1:Willis*)

3.2.1.2 Account Creation Processing

The account creation process shall be completed within 5 seconds after submission on a normal 5G connection. (*O:Willis*)

3.2.1.3 Dashboard Loading Time

The dashboard shall load within 3 seconds on a normal 5G connection. (*O:Willis*)

3.2.1.4 Baby Profile Creation Processing

The system shall complete the baby profile creation process within 3 seconds after submission on a normal 5G connection. (*O:Willis*)

3.2.1.5 Daily Report Creation Processing

The system shall generate a daily report within 3 seconds after submission on a normal 5G connection. (*O:Willis*)

3.2.1.6 Food Tracking Entry Processing

The system shall process the creation of a food tracking entry within 3 seconds after submission on a normal 5G connection. (*O:Salisbury, M1:Willis*)

3.2.1.7 Food Item Search Processing

The system shall return search results for food items within 3 seconds after submission on a normal 5G connection. (*O:Williams, M1:Willis*)

3.2.2 Throughput

3.2.2.1 Account Registration

The system shall support multiple users creating accounts. (*O:Ledwith*)

3.2.2.2 Simultaneous User Sessions

The system shall allow multiple users to simultaneously access and utilize the application's features. (*O:Ledwith*)

3.2.2.3 Daily Reports

The system shall allow multiple users to generate and download daily reports. (*O:Ledwith*)

3.2.3 Execution Time

3.2.3.1 Database Queries

Database queries made by the user via food search shall execute within 2 seconds to maintain performance. (*O:Williams*)

3.2.3.2 Daily Report Generation

The system shall generate daily reports within 2 seconds. (*O:Ledwith*)

3.2.4 Storage Capacity

3.2.4.1 The system shall have the capability of storing user account data, profiles, and daily reports. (*O:Ledwith*)

3.3 Design Constraints

3.3.1 Compatibility Requirement

The software shall be compatible with Google Chrome, Mozilla Firefox, and Apple Safari. (*O: Salisbury*)

3.3.2 Scalability Requirement

The system architecture shall accommodate increased user loads and ensure continued performance and efficiency as usage scales over time. (*O: Salisbury, MI: Willis*)

3.4 Software System Attributes

3.4.1 Reliability

The system shall operate with minimal to no crashing or data loss during normal use. All user data including baby profiles, food tracking entries, and daily reports shall be stored in a persistent database to ensure data retention across server restarts. In the event of a system or network failure, the application shall display an error message and allow the user to retry the action without losing previously entered data. (*O:Salisbury, M1:Willis*)

3.4.2 Availability

The system shall maintain an average monthly uptime of 99.44%, accounting for scheduled weekly maintenance (if necessary), to ensure continuous user access. (*O:Salisbury, M1:Willis*)

3.4.3 Security

User data shall be protected using Django's SHA-256 hashing algorithm to prevent unauthorized access to the data. (*O:Salisbury, M1:Willis*)

3.4.4 Maintainability

The codebase shall incorporate industry-standard documentation and practices to ensure ease of maintenance, scalability, and upgrades. (*O:Salisbury, M1:Willis*)

3.4.5 User Portability

The software shall adjust to various screen sizes and resolutions to accommodate desktop, tablet, and mobile devices. (*O:Ledwith M1:Willis*)

3.5 Other Requirements

3.5.1 Regulatory Requirements

The system shall comply with relevant data protection laws and regulations to ensure user privacy is safeguarded. (O:Salisbury, M1:Willis)

3.5.2 Copyright Compliance

All content, including but not limited to audio, visuals, and written materials, shall be owned by the development team. Third party materials used shall be properly licensed or used with permission from the original authors to ensure compliance with copyright laws and regulations. (O:Salisbury, M1:Willis)

3.5.3 User Feedback

The system shall provide users with the ability to send feedback to the developers, such as surveys and ratings. (O:Salisbury, M1:Willis)