



BabyBites



Introducing Solids, One Bite at a Time

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Meet the Team



Martin Salisbury



A second degree student pursuing his Masters in Computer Science. His previous degree is Electrical Engineering. He is a Navy Veteran and former Defense Contractor. His hobbies include traveling, hiking, cooking, and gaming.

Diogo Silva



A third year student pursuing a bachelor's degree in Computer Science. He is a collegiate athlete, a member of Old Dominion University's sailing team. His hobbies include traveling, hiking, and sports.

Cameron Williams



A senior undergraduate student pursuing a Bachelor's degree in Computer Science. He is a member of Old Dominion University, his hobbies include playing instruments and going to the gym.

Dominique Willis



A senior undergraduate student pursuing a Bachelor's in Computer Science with a minor in Cybersecurity. She currently works as an Aviation Maintenance Administrationman. In her free time, she enjoys spending time with her family and dogs.

Dan Ledwith



A second degree student pursuing a bachelor's degree in computer science. His previous degree is in economics, and he currently works as a financial analyst for a registered investment advisor. His hobbies include cooking and playing the guitar.

Asia Acosta



A third year student pursuing her BA in Computer Science. She is a collegiate athlete; a member of Old Dominion University's sailing team. Her hobbies consist of traveling, photography, and sports.

Elevator Pitch

Shouldn't feeding your child be simpler and less stressful? BabyBites is designed to help you navigate the transition from milk to solids and beyond. It removes the uncertainty from feeding with expert resources and alert notifications, ensuring your child's meals are safe and nutritious.



The Problem

The process of transitioning a baby from milk to solid foods and eventually, to more complex meals appropriate for toddlers is a crucial, yet challenging, phase for many parents and caregivers.

Typically, babies begin this transition around six months, starting with pureed foods before gradually moving to more textured solids¹. This can be overwhelming for parents and caregivers, as it can be difficult to know which foods are safe at various stages, how to prepare them, and when to introduce certain utensils.

This transition goes beyond simply feeding, it is about fostering safe, balanced nutrition while supporting babies and toddlers in developing essential eating skills and independence.

¹(Kuo et al., 2010; *Infant Food and Feeding*, n.d.)



Problem Characteristics



25-35% of new parents struggle in the feeding transition from milk to solids (Norlyk et al., 2019).

Babies/toddlers vary in response to different textures, appearance, smell, and taste of foods.

The balance of required nutrition and the babies/toddlers' acceptance of different foods pose many challenges.

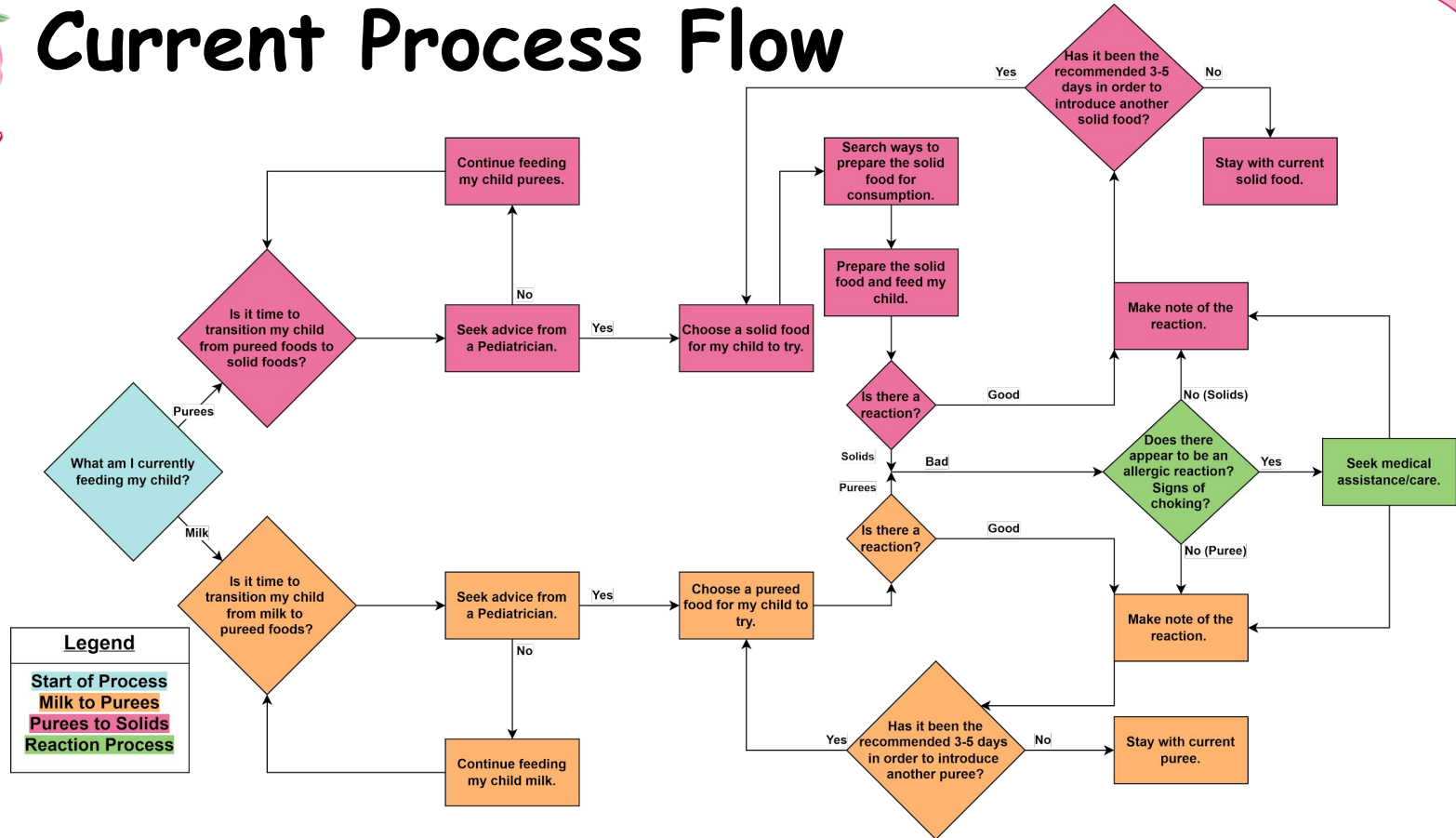
It can be difficult to adapt a child's diet to accommodate food allergies.

According to the Centers for Disease Control and Prevention (CDC) (2024), food preparation can increase choking risks, especially when foods are served uncooked, whole, or in certain shapes or sizes.

According to the World Health Organization (WHO) (2023), undernutrition is estimated to be associated with 2.7 million child deaths annually or 45% of all child deaths.



Current Process Flow



The Solution



Introducing BabyBites, the ultimate mobile-first web application to simplify and safeguard your babies' and toddlers' feeding journey. From the first spoonful of purees to mastering utensils, BabyBites takes the stress out of transitioning from milk to solids and beyond. Designed to reduce overwhelm, the app ensures balanced nutrition and helps babies and toddlers develop healthy eating habits.

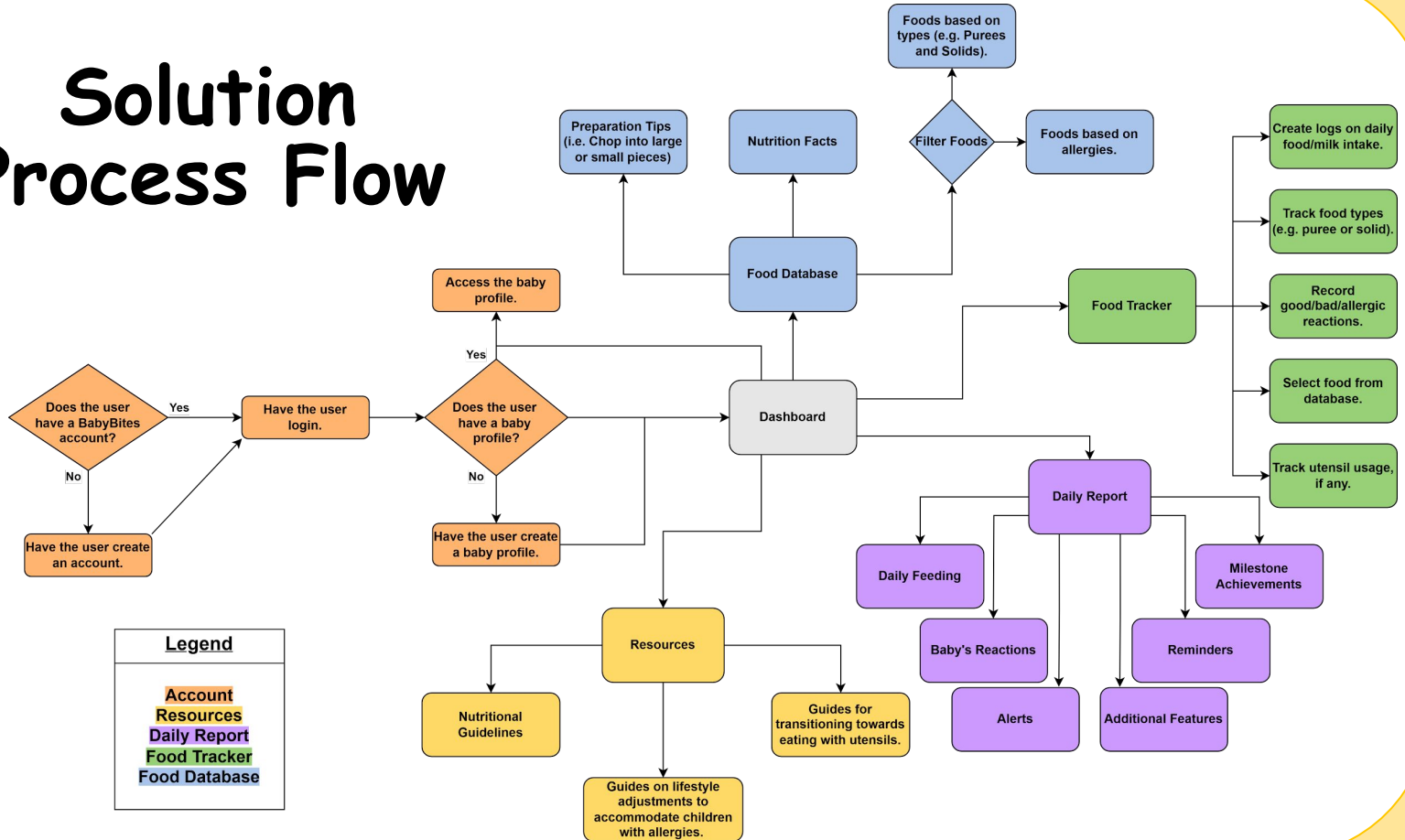
This challenging transition is made easier with BabyBites, complete with features such as: a personalized baby profile, a food tracker, a food database, daily reports, and alert notifications.

BabyBites provides parents and caregivers with expert-backed resources, meal preparation tips, alerts about allergies, choking hazards, and developmental milestones that will give parents and caregivers the peace of mind and the confidence to nurture their child's growth.





Solution Process Flow



What BabyBites Will Do



Guide Parents/Caregivers
through Food Transitions



Provide Access to
Expert Resources



Offer Food Database &
Nutrition Information through
FoodData Central API



Send Alert Notifications



Track Food/Milk Intake



Generate Daily Reports



Provide Food Preparation
Guidance



BabyBites Daily Report

Daily Feeding

- Food intake:
 - Solids
 - Purees
- Liquid intake (oz):
 - Milk
 - Water
- Utensil usage
- Parent/Caregiver notes

Baby's Reaction

- 😊 Liked
- 😞 Disliked
- ❤️ Loved
- 🚫 Allergic reactions
- 🚑 Choking hazards

Milestone Achievements

- 🍎 Tried a new food
- 🏆 Self-fed successfully
- 🍴 First time using a utensil

Alerts

- Choking risk foods given today
- Allergy risk foods given today
- Nutrient deficiency warning

Reminders

- Offer water regularly
- Try a new puree/solid tomorrow
- Try introducing utensils tomorrow

Additional Features

- Download report
- Share report
- Compare report to previous reports
- Optional photo upload

What BabyBites Will Not Do



Prepare or Deliver
Meals



Create Personalized
Meal Plans



Provide Real-Time
Emergency Support



Identify or Diagnose
Medical Conditions



Track Non-Feeding
Related Milestones



Provide Communication
with Healthcare Providers

Competition Matrix



Features	BabyBites	Baby Tracker	Huckleberry	Solid Starts	Glow Baby	Baby Connect
Create Baby Profile	✓	✓	✓	✓	✓	✓
Track Food Intake	✓	✓	✓	✓	✓	✓
Food Database	✓	✗	✓	✓	✓	✗
Food Nutrition Information	✓	✗	✗	✓	✗	✗
Utensil Usage Guide	✓	✗	✗	✓	✗	✗
Meal Preparation Guide	✓	✗	✗	✓	✗	✗
Expert Resources	✓	✗	✓	✓	✓	✗
No Ads	✓	✗	✓	✓	✗	✓
Mobile Website	✓	✗	✗	✗	✗	✓
Mobile App	✗	✓	✓	✓	✓	✓
No paywall	✓	✗	✗	✗	✗	✗
Choking Hazards	✓	✗	✗	✓	✗	✗
Allergen Information	✓	✗	✗	✓	✗	✗
Daily Reports	✓	✗	✗	✗	✗	✗
Alert Notifications	✓	✓	✓	✓	✓	✓

Major Functional Components

An orange with a green leaf and a stem, used as a decorative icon for the Frontend component.

Frontend:

React.js

An orange with a green leaf and a stem, used as a decorative icon for the Backend component.

Backend:

Django

An orange with a green leaf and a stem, used as a decorative icon for the Database component.

Database:

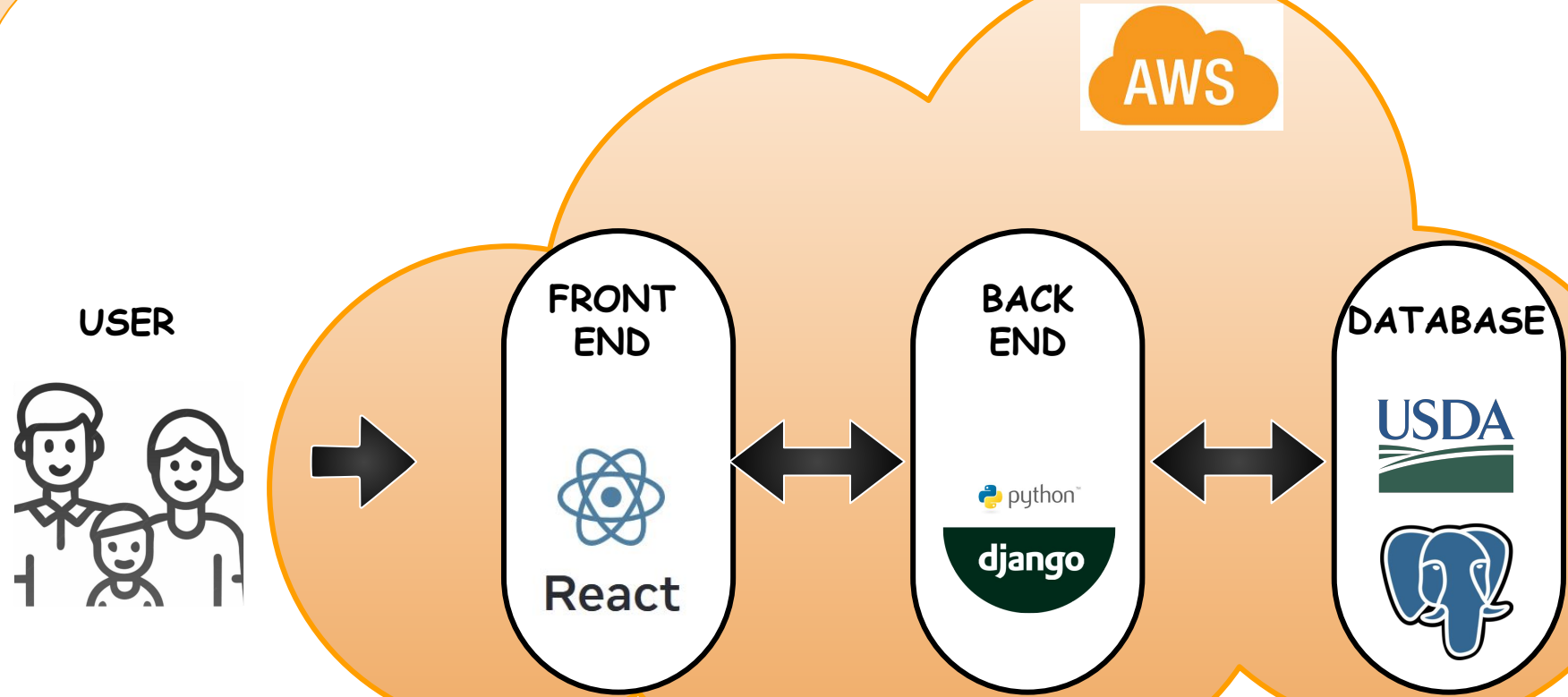
PostgreSQL

An orange with a green leaf and a stem, used as a decorative icon for the Hosting component.

Hosting:

Amazon Web
Services
(AWS)

Major Functional Components Diagram



Work Breakdown Structure



User
Interface

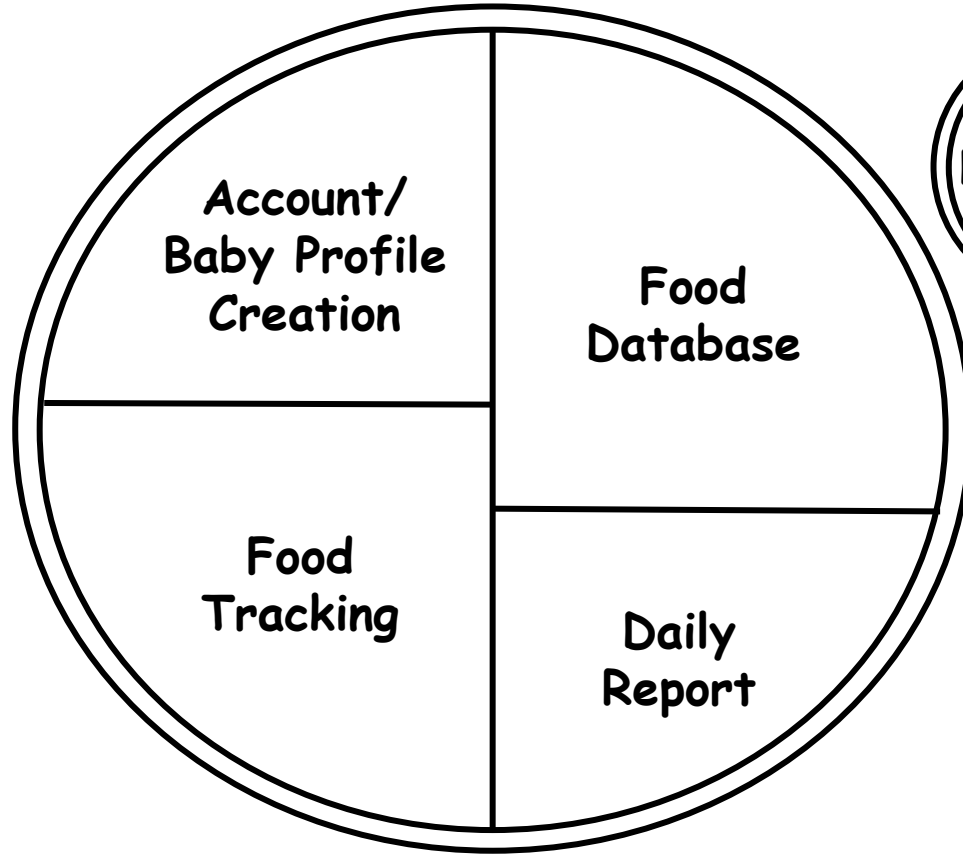
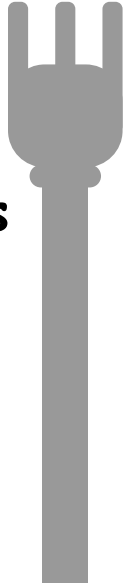
Algorithms

Database

Testing

Algorithms

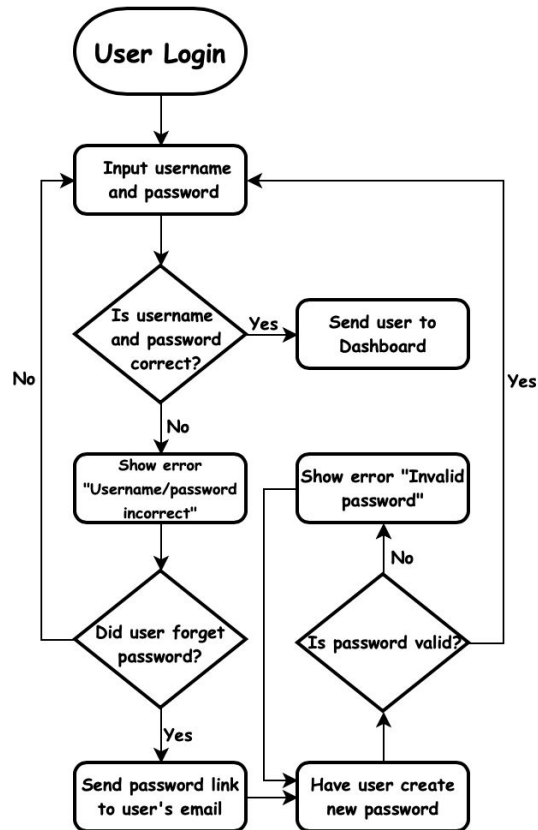
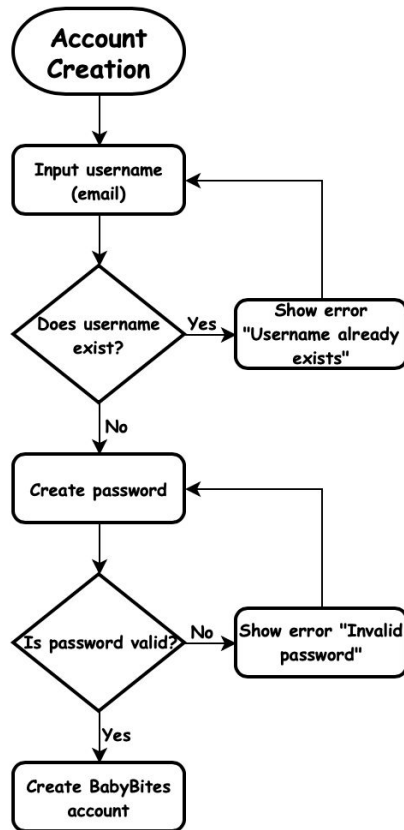
**BabyBites
Plate**



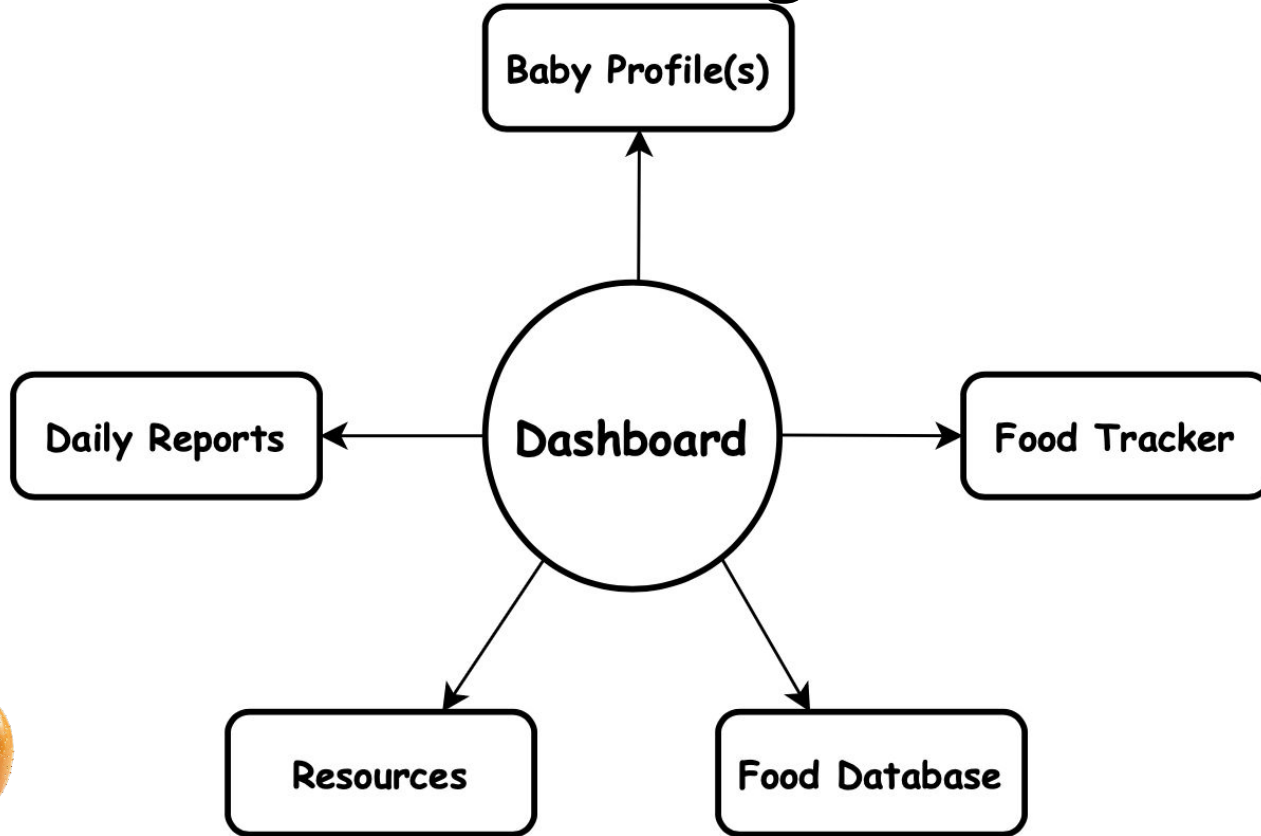
Dashboard



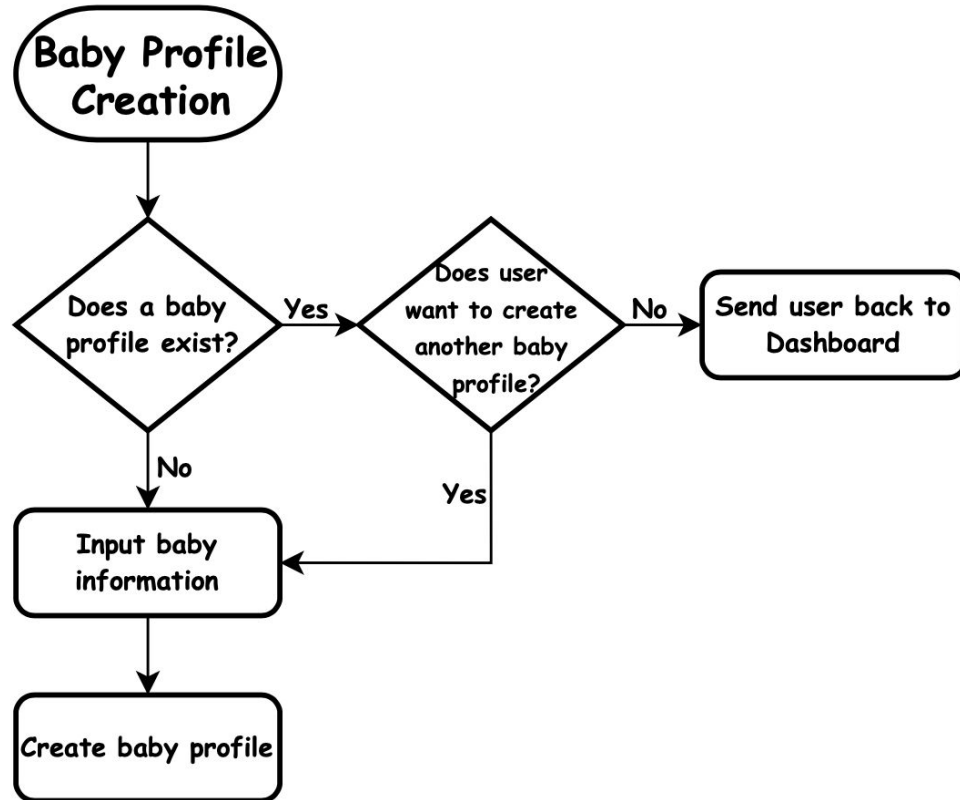
Account Creation Algorithm



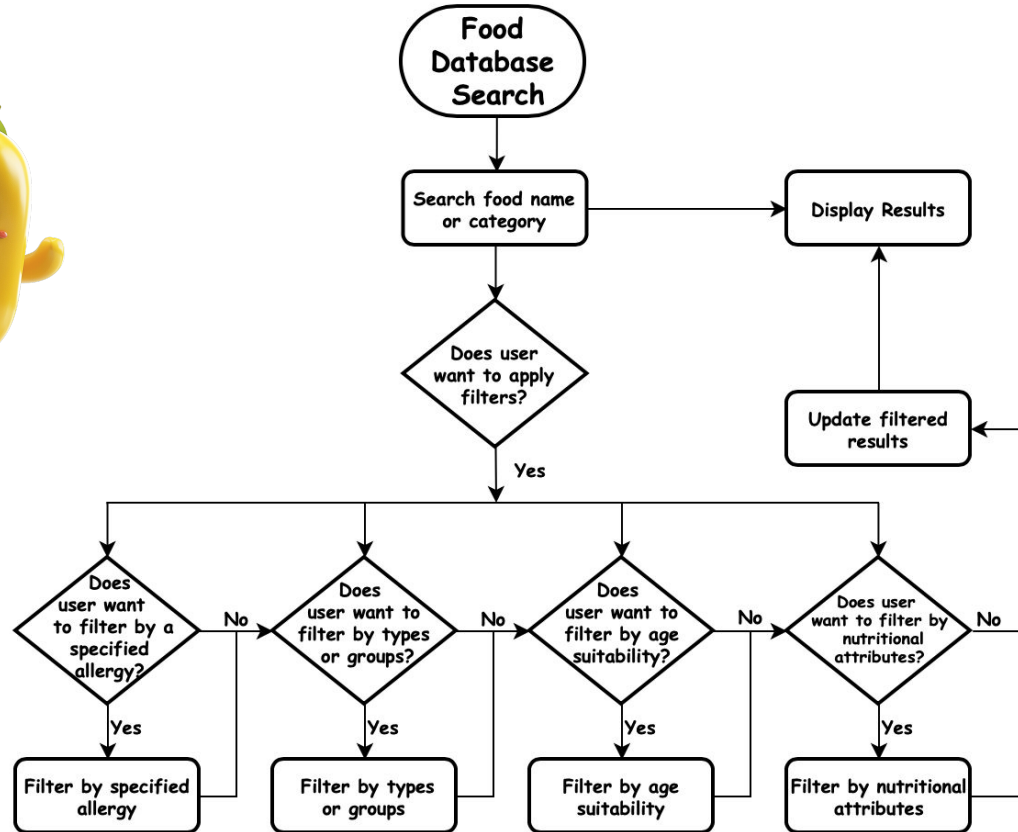
Dashboard Algorithm



Baby Profile Creation Algorithm



Food Database Search Algorithm



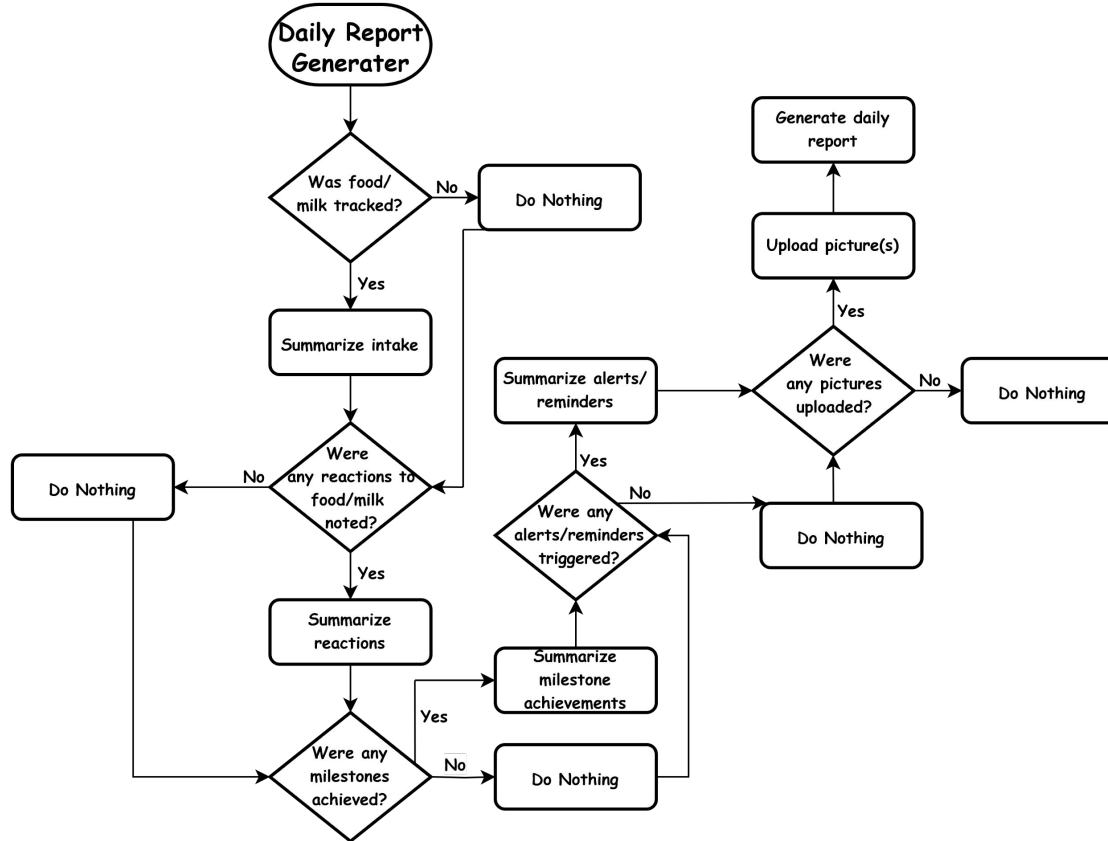
Food Tracking Algorithm

- Food Tracking
 - Prompt the user to input food item name, quantity, food type, time of consumption, utensil used. After entries, ask if any reactions have occurred.
 - Log the reactions and link specific food entry then store in daily log under the current date.
- Nutrition Deficiency
 - Check the food tracker data of baby profile(s) (e.g. age, weight, and feeding history).
 - Compare the child's food tracker data to datatable of corresponding data ranges.
 - If the child's nutrition < standard, send an alert to user.
- Allergy and Choking Hazard Detection
 - Check the feeding history of, as well as, known allergies in baby profile(s).
 - Compare items in feeding history to database of known allergens.
 - If any item(s) are found, flag specific food(s), and send an alert to user.



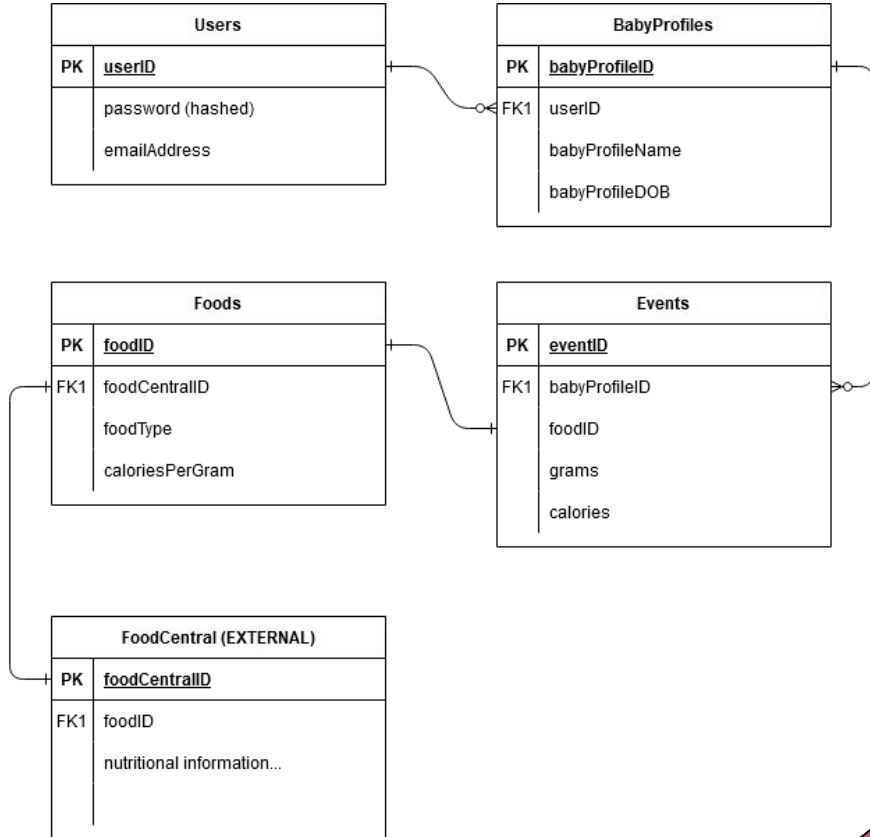


Daily Report Algorithm

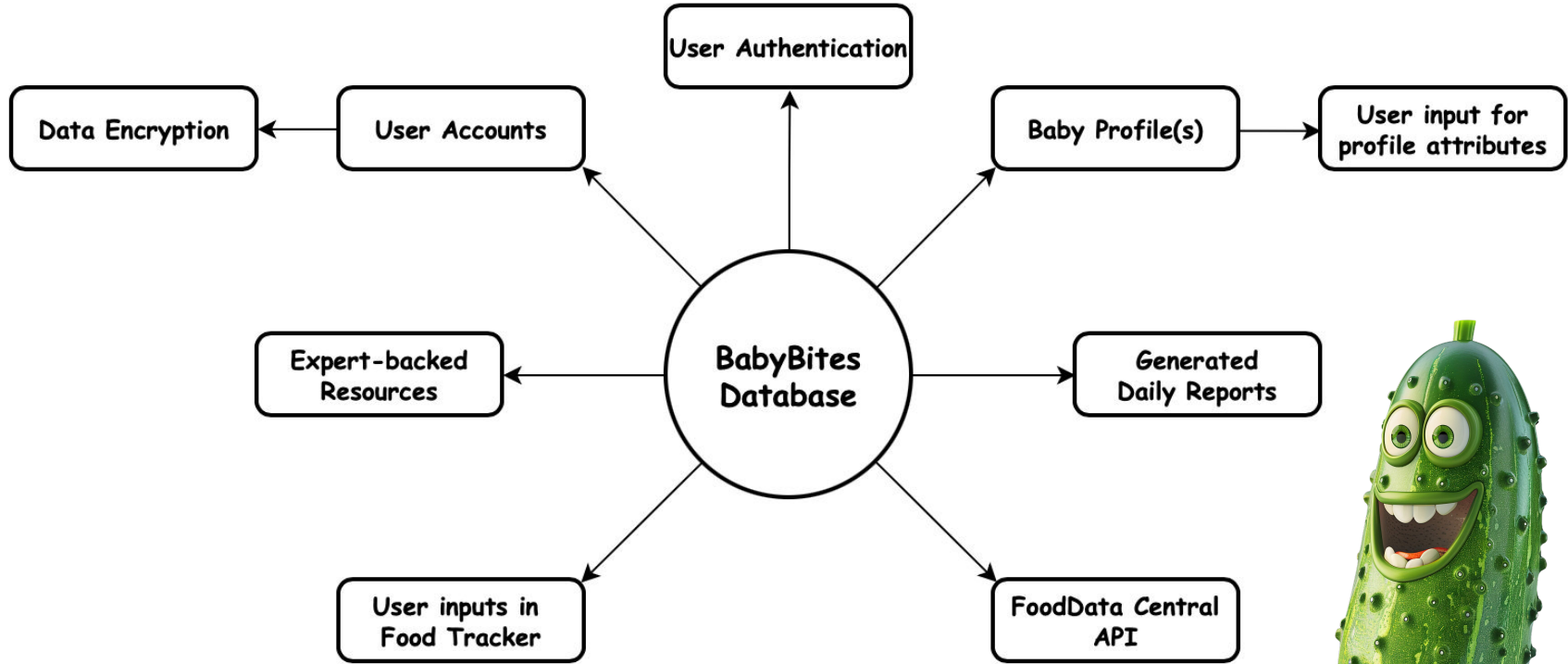


Database Schema

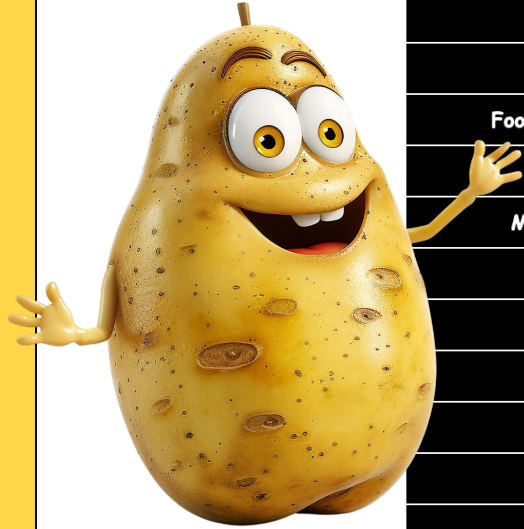
- Data that we need to store:
 - User information
 - User ID
 - Password
 - Email address
 - Baby profiles
 - Users may have many baby profiles, but each baby profile has just one user
 - Events
 - Users will log many events for a baby profile
 - Nutritional information
 - We will store nutritional information in our database
 - Nutritional information source
 - We will fetch new nutritional information from FoodCentral API



Data Management



Real World Product vs Prototype



Features	Real World Product	Prototype
Create Baby Profile	✓	✓
Track Food Intake	✓	✓
Food Database	✓	✓
Food Nutrition Information	✓	✓
Utensil Usage Guide	✓	✓
Meal Preparation Guide	✓	✓
Expert Resources	✓	✓
No Ads	✓	✓
Mobile Website	✓	✓
No paywall	✓	✓
Choking Hazards	✓	✓
Allergen Information	✓	✓
Daily Reports	✓	✓
Alert Notifications	✓	✓
Recall Alerts	✓	✗

Development Tools

Version Control

GitHub

Project
Management

Trello

CI & CD

GitHub
Actions
&
Workflows

IDE

VSCode

Front End

React

Back End

Django

Database

PostgreSQL
&
FoodData
Central API

Testing

PyTest
&
Jest

Documentation

PyDoc
&
JSDoc

Hosting

AWS

Required Libraries, Tools, & Technologies



Libraries: React



Languages: Python,
Javascript, HTML, CSS



Frameworks: Django



Other: PostgreSQL,
FoodCentral API

Development Model

Agile:

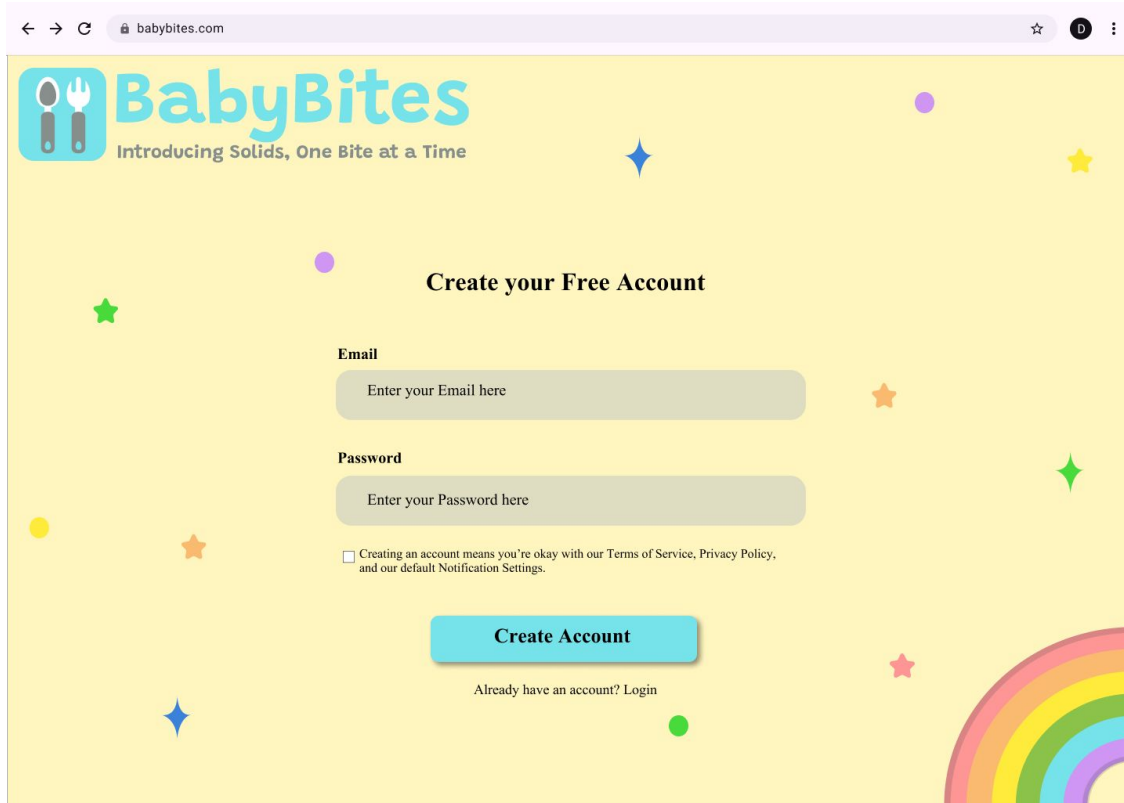
- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

Our team will follow an Agile Development Model as it emphasizes collaboration, adaptability and continuous improvement, allowing us to respond effectively to change and feedback.

(Cunningham, Manifesto for Agile Software Development 2001)
(Ward & Bailey, What is Agile Software Development? 2024)



GUI Mockup - Account Creation



The desktop view of the account creation page features a light yellow background with a whimsical pattern of colorful stars, dots, and a rainbow in the bottom right corner. At the top left is the BabyBites logo, which includes a blue square icon with a white fork and spoon, followed by the text "BabyBites" in a large, rounded blue font, and the tagline "Introducing Solids, One Bite at a Time" in a smaller, grey font below it. The main heading "Create your Free Account" is centered in a bold, black font. Below this are two input fields: "Email" with the placeholder "Enter your Email here" and "Password" with the placeholder "Enter your Password here". Both fields have a light grey background. Under the password field is a checkbox with the text "Creating an account means you're okay with our Terms of Service, Privacy Policy, and our default Notification Settings." At the bottom center is a blue "Create Account" button. Below the button is the text "Already have an account? Login". The browser's address bar at the top shows "babybites.com".

BabyBites
Introducing Solids, One Bite at a Time

Create your Free Account

Email
Enter your Email here

Password
Enter your Password here

☐ Creating an account means you're okay with our Terms of Service, Privacy Policy, and our default Notification Settings.

Create Account

Already have an account? Login



The mobile view of the account creation page is displayed on a smartphone screen. It maintains the same light yellow background and whimsical pattern as the desktop version. The BabyBites logo is at the top, followed by the heading "Create your Free Account". The input fields for "Email" and "Password" are stacked vertically, each with a light grey background and a placeholder. Below the password field is a checkbox with the same text as the desktop version. A blue "Create Account" button is positioned at the bottom, with the text "Already have an account? Login" centered below it. The smartphone's status bar at the top shows the time "9:41" and various icons for signal, Wi-Fi, and battery.

9:41

BabyBites
Introducing Solids, One Bite at a Time

Create your Free Account

Email
Enter your Email here

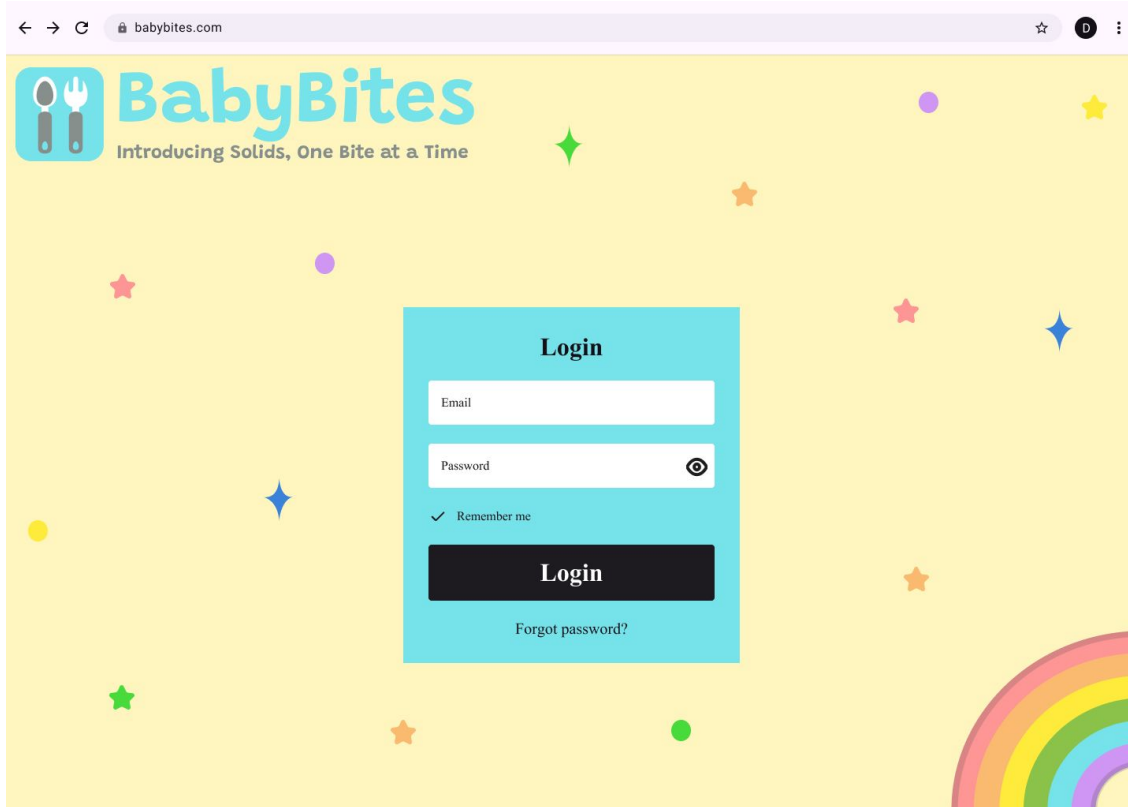
Password
Enter your Password here

☐ Creating an account means you're okay with our Terms of Service, Privacy Policy, and our default Notification Settings.

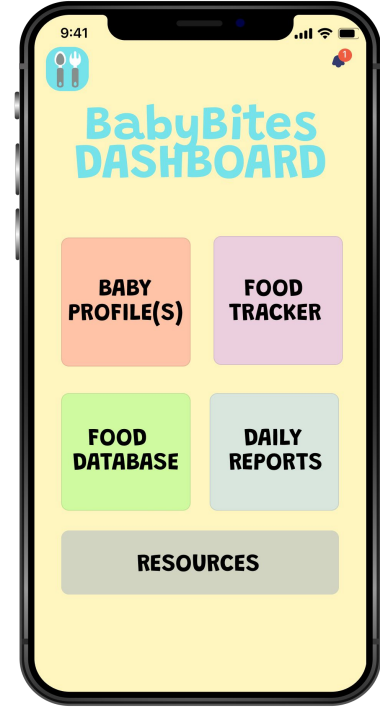
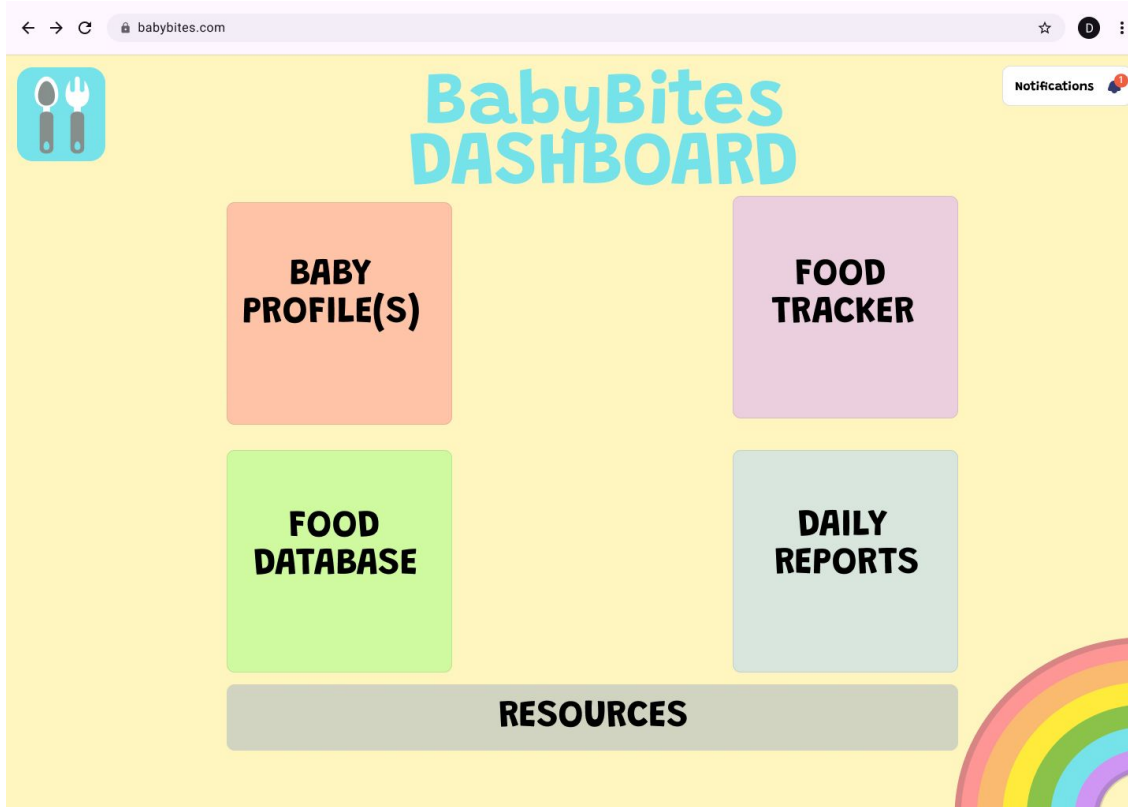
Create Account

Already have an account? Login

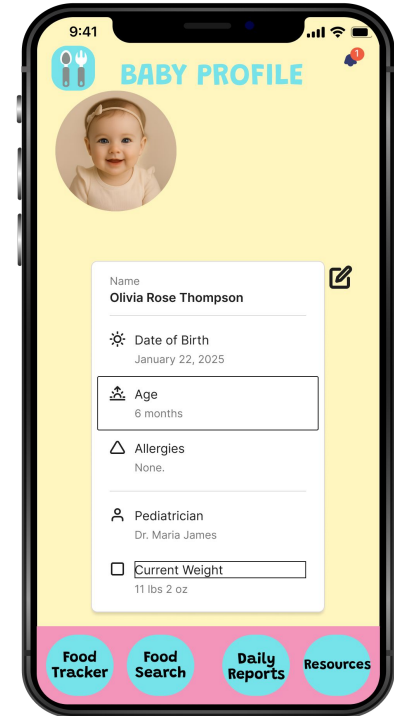
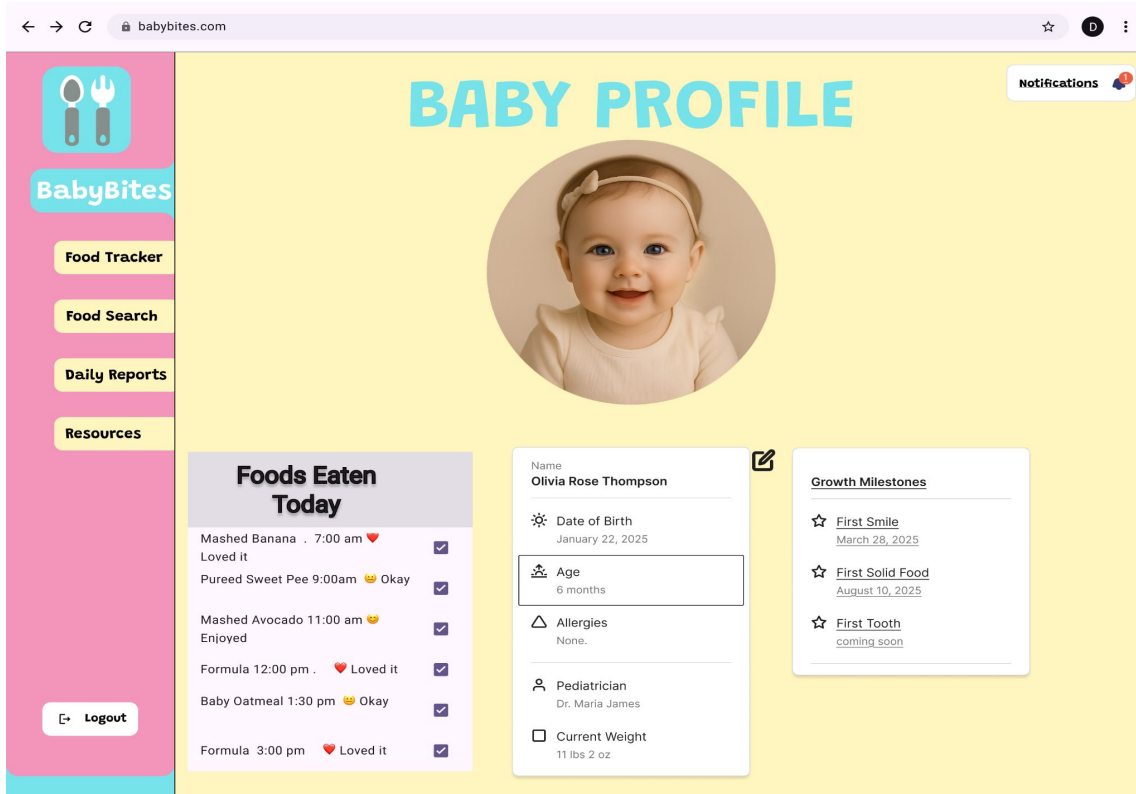
GUI Mockup - Login



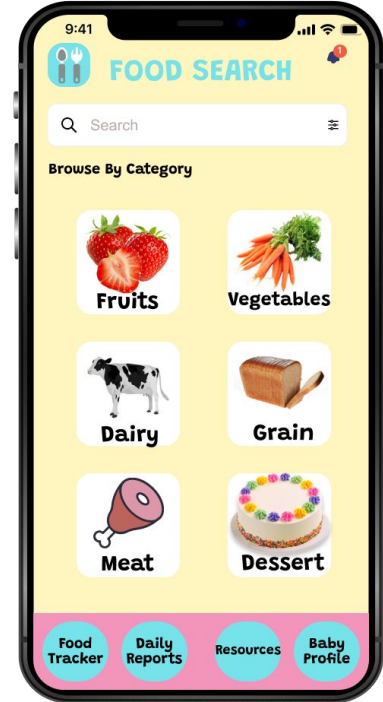
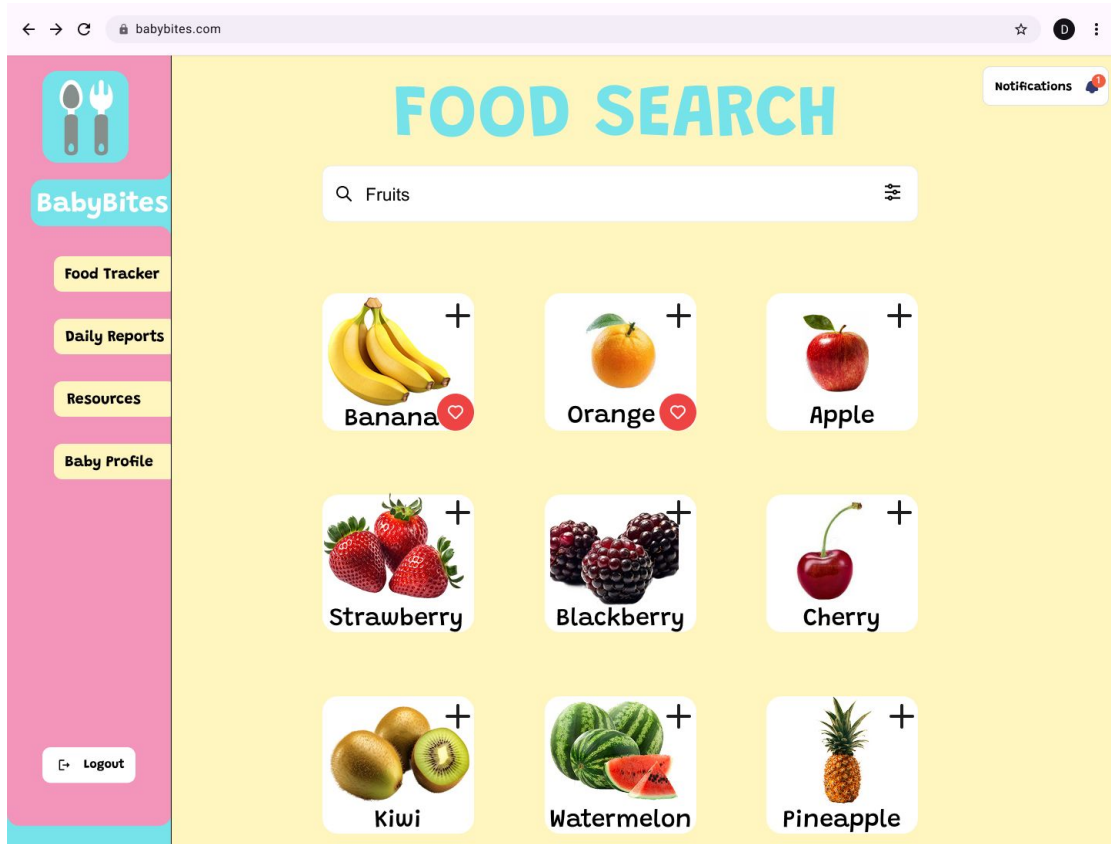
GUI Mockup - Dashboard



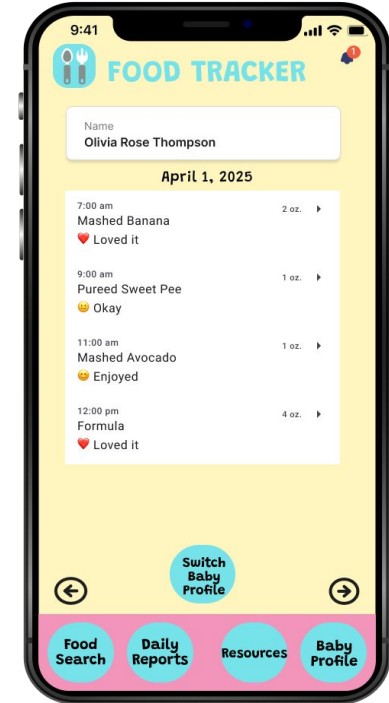
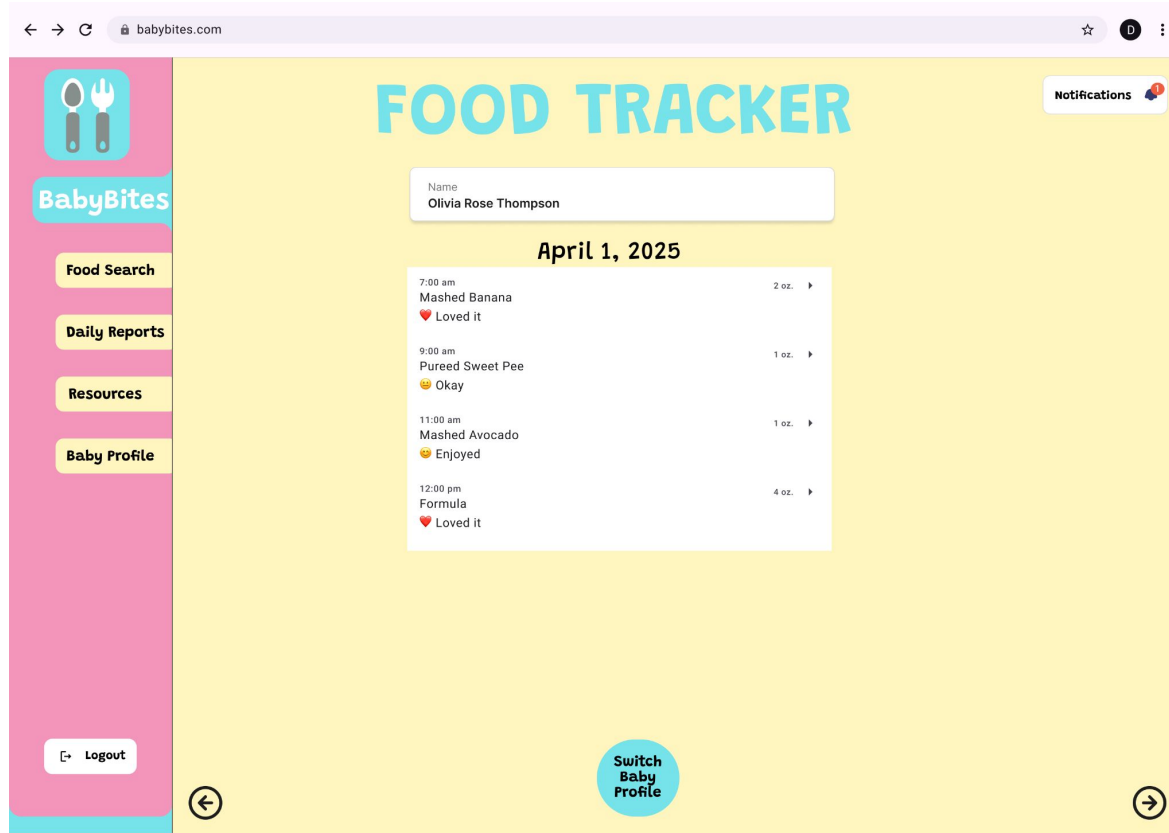
GUI Mockup - Baby Profile



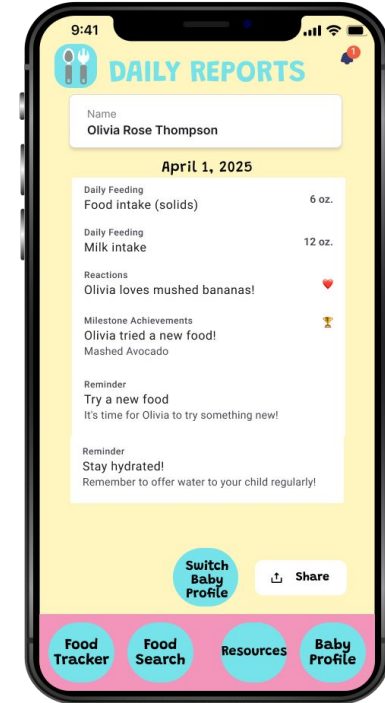
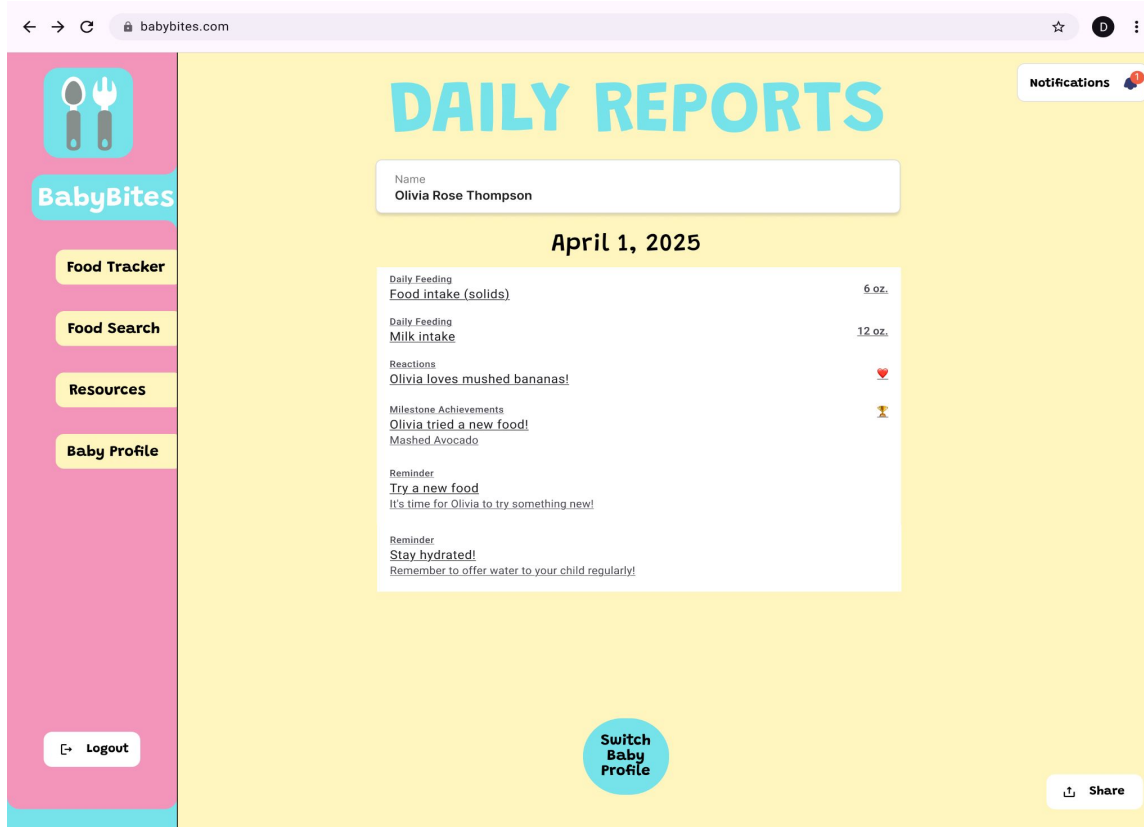
GUI Mockup - Food Search



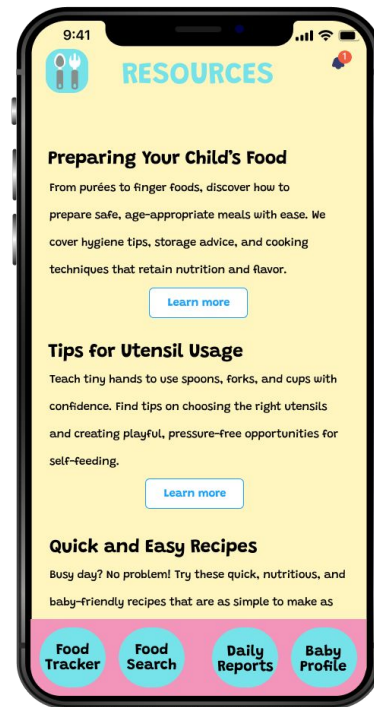
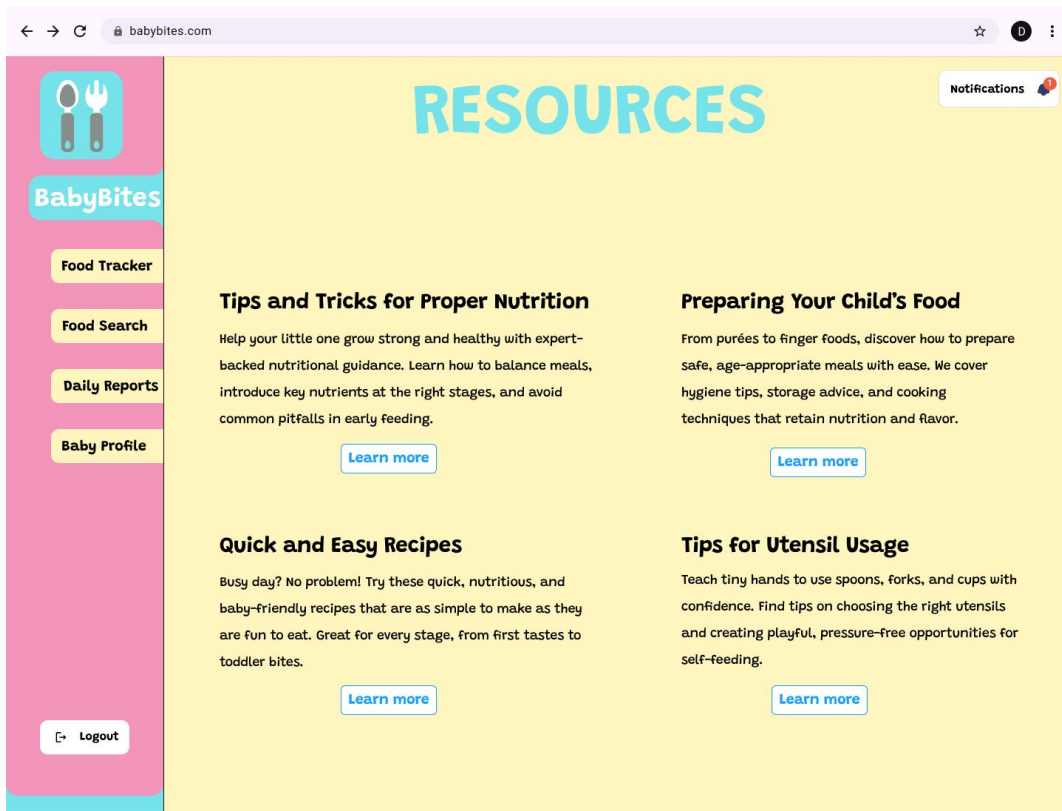
GUI Mockup - Food Tracker



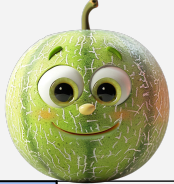
GUI Mockup - Daily Reports



GUI Mockup - Resources



Risks



		Severity of Impact				
		Very Low 1	Low 2	Medium 3	High 4	Very High 5
Likelihood of Occurrence	Very High 5					
	High 4		S1			U1
	Medium 3				U1-M	
	Low 2	S1-M				U2
	Very Low 1			U2-M		

(Risk Management in Software Engineering 2022)

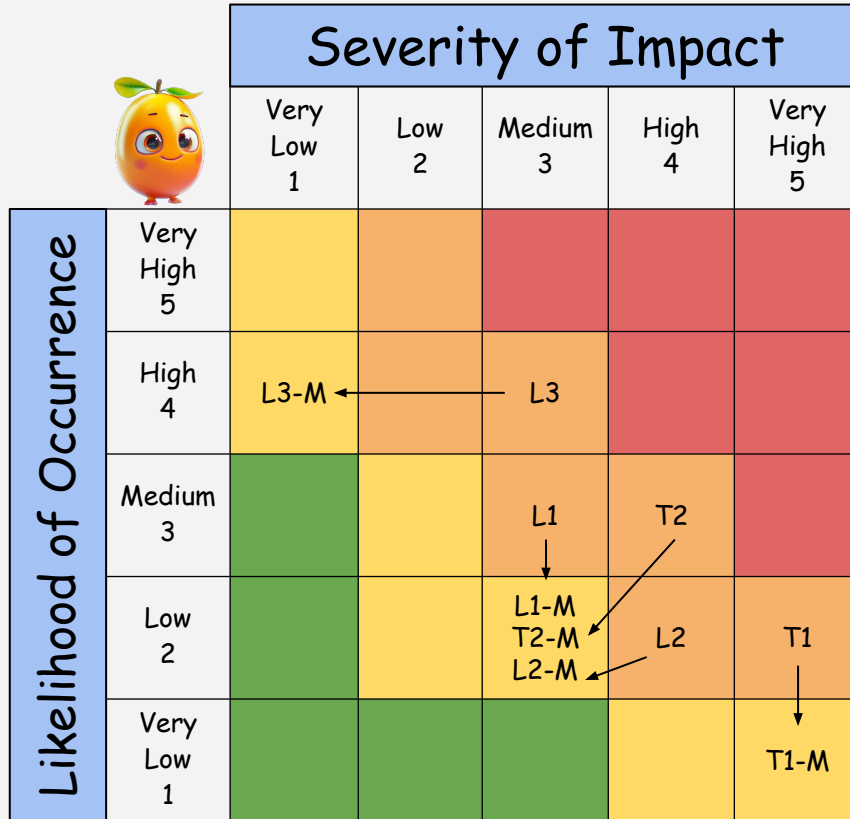
User Risks:

- **U1:** User engagement may decline if UI is frustrating or difficult to navigate.
 - U1-M: Mitigate by gathering feedback from users during the testing phase. Incorporate feedback to improve design.
- **U2:** Long loading times can lead to a frustrating user experience.
 - U2-M: Mitigate with thorough system testing and continuous monitoring.

Security Risks:

- **S1:** User Data consists of personally identifiable information ("PII") [which could be exposed through a breach].
 - S1-M: Mitigate by minimizing the amount of PII stored, and by implementing industry best practices for storing sensitive information. Implement strong user-authentication.

Risks



		Severity of Impact				
		Very Low 1	Low 2	Medium 3	High 4	Very High 5
Likelihood of Occurrence	Very High 5					
	High 4	L3-M ←		L3		
	Medium 3			L1 ↓	T2 ↗	
	Low 2			L1-M ↙ T2-M ↙ L2-M ↙	L2 ↘	T1 ↓
	Very Low 1					T1-M ↓

(Risk Management in Software Engineering 2022)

Technical Risks:

- **T1:** In the event the user base grows rapidly, the increase in traffic may cause server issues. Scalability may be an issue.
 - T1-M: Mitigate by using a scalable, cloud-based backend system.
- **T2:** Insufficient testing can produce bugs or unintended user experience.
 - T2-M: Mitigate with a test-driven development process, ensuring full test coverage, and user feedback.

Legal Risks:

- **L1:** Failure to protect children's data may violate Children's Online Privacy Protection Act (COPPA).
 - L1-M: Mitigate by staying up to date with privacy regulations: COPPA, General Data Protection Regulation (GDPR), and California Consumer Protection Act (CCPA).
- **L2:** Non-compliance with data protection laws could result in legal penalties.
 - L2-M: Mitigate by only taking/using data that is necessary. Comply with GDPR and CCPA.
- **L3:** Being misidentified as a source of medical or health advice or provider of care.
 - L3-M: Mitigate by clearly stating the contrary in a notice separate of any other information.

Conclusion

The process of transitioning a baby from milk to solid foods and eventually, to more complex meals appropriate for toddlers is a crucial, yet challenging, phase for many parents and caregivers.

This challenging transition is made easier with BabyBites, complete with features such as: a personalized baby profile, a food tracker, a food database, daily reports, and alert notifications.

BabyBites provides parents and caregivers with expert-backed resources, meal preparation tips, alerts about allergies, choking hazards, and developmental milestones that will give parents and caregivers the peace of mind and the confidence to nurture their child's growth.

Shouldn't feeding your child be simpler and less stressful?

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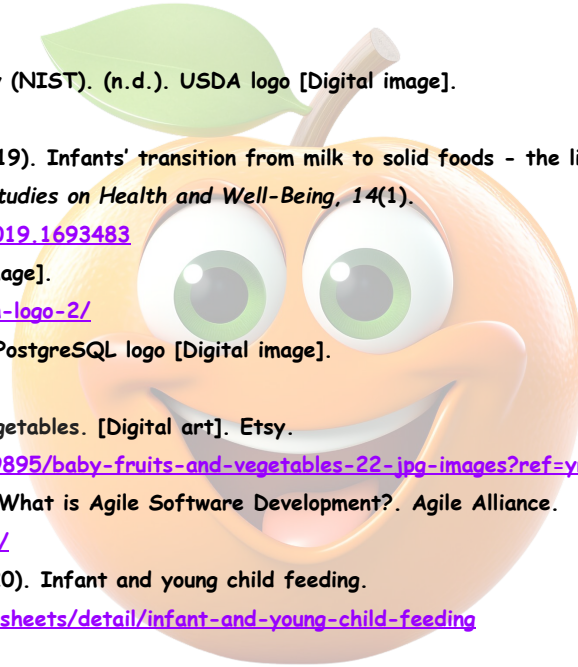
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Appendix



