



# BabyBites

Introducing Solids, One Bite at a Time



# Table of Contents

<u>Meet the Team</u>	3
<u>Elevator Pitch</u>	4
<u>The Problem</u>	5
<u>Problem Characteristics</u>	6
<u>Current Process Flow</u>	7
<u>The Solution</u>	8
<u>Solution Process Flow</u>	9
<u>What BabyBites Will Do</u>	10
<u>BabyBites Daily Report</u>	11
<u>What BabyBites Will Not Do</u>	12
<u>Competition Matrix</u>	13
<u>Major Functional Components</u>	14
<u>Major Functional Components Diagram</u>	15

<u>Work Breakdown Structure</u>	16
<u>Algorithms</u>	17-23
<u>Database Schema</u>	24
<u>Data Management</u>	25
<u>Real World Product vs Prototype</u>	26
<u>Development Tools</u>	27
<u>Required Libraries, Tools, &amp; Technologies</u>	28
<u>Development Model</u>	29
<u>GUI Mockups</u>	30-37
<u>Risks</u>	38-39
<u>Conclusion</u>	40
<u>References</u>	41-42
<u>Appendix</u>	43

# Meet the Team

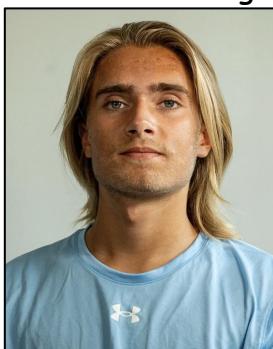


## Martin Salisbury



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 solids<sup>1</sup>. 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.

<sup>1</sup>(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.

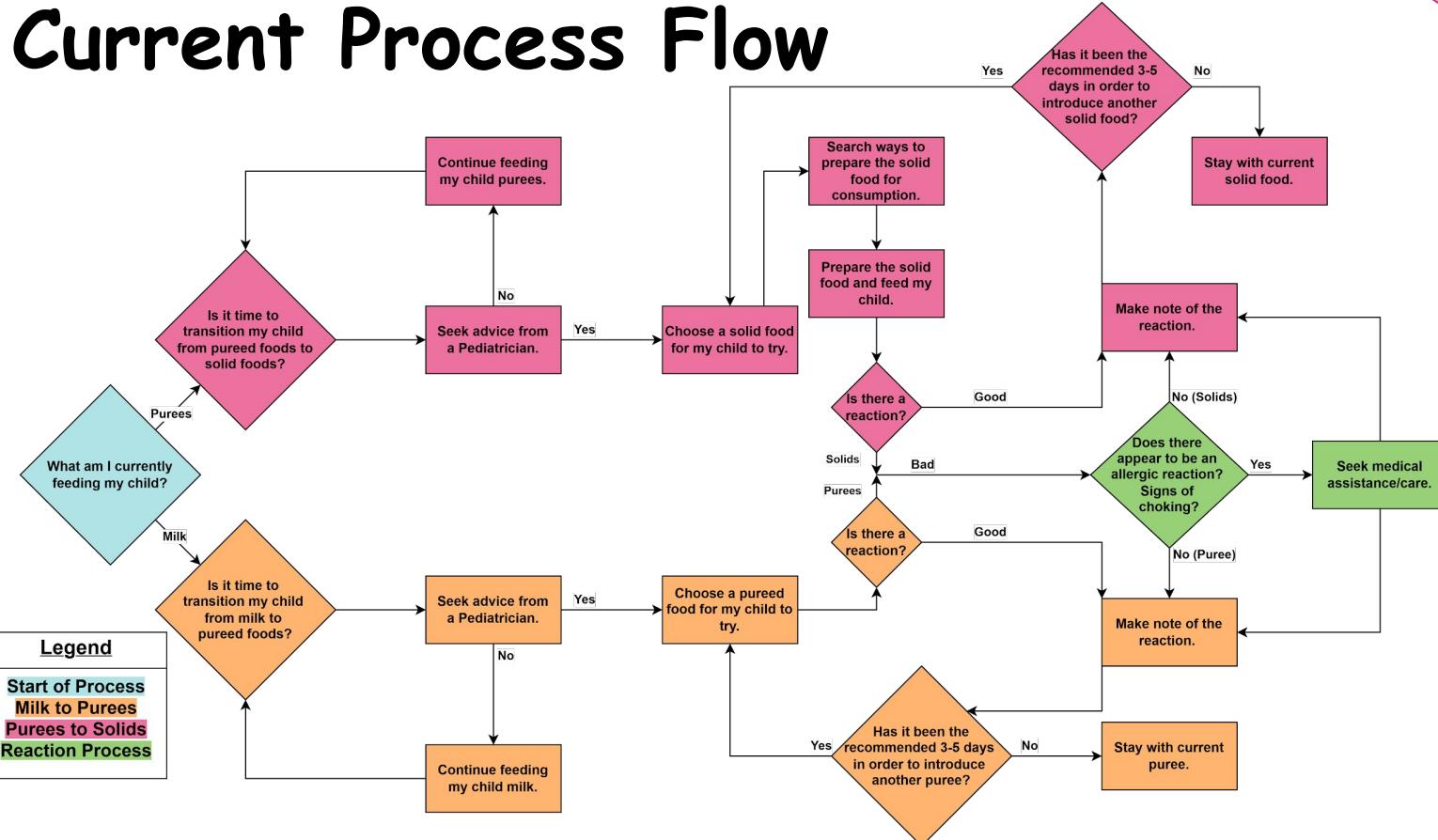
The balance of required nutrition and the babies/toddlers' acceptance of different foods pose many challenges.

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.

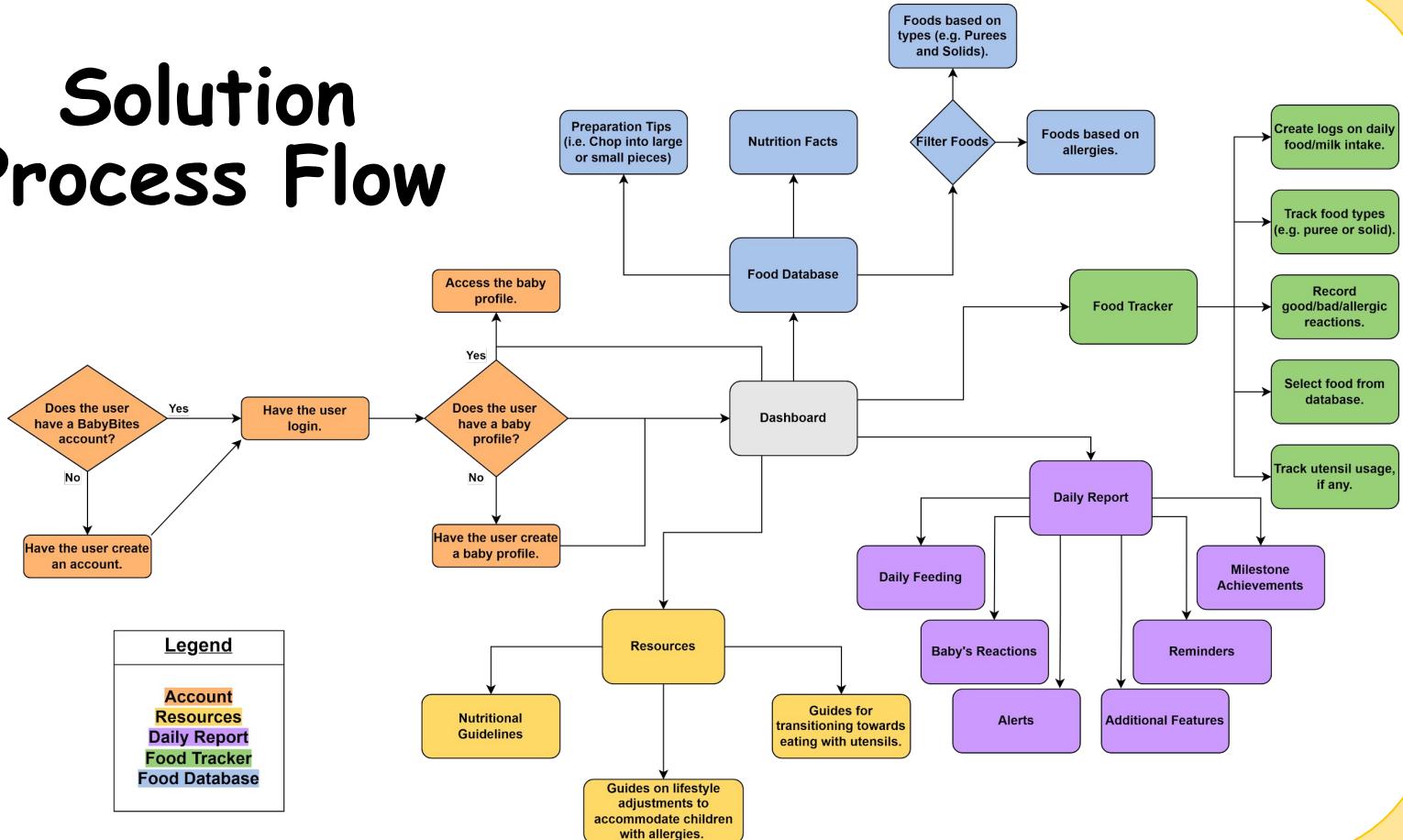
This challenging transition is made easier with BabyBites, complete with features such as: a personalized baby profile, a food tracker, a food database, daily reports, and alert notifications.

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

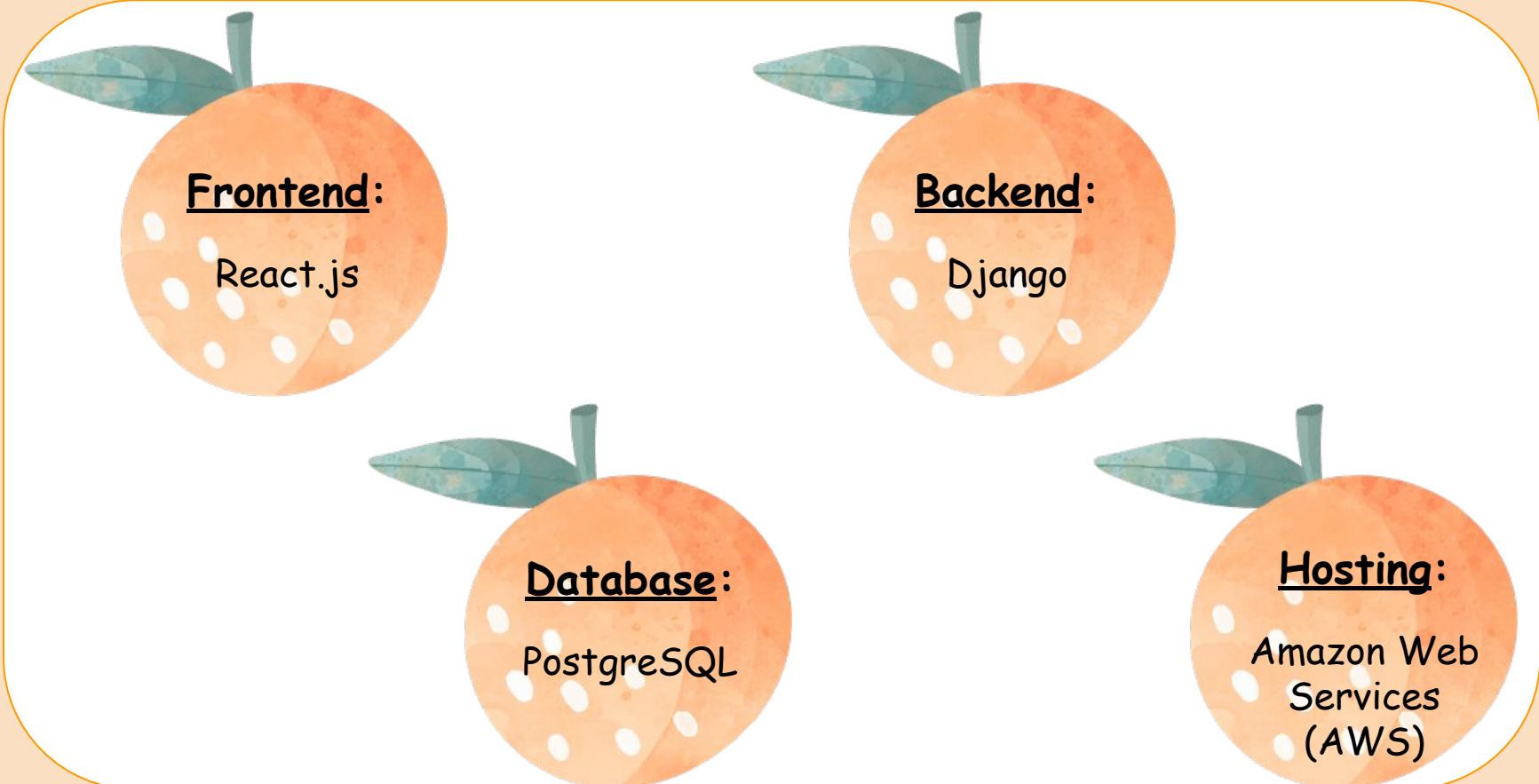
# Competition Matrix



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	✓	✓	✓	✓	✓	✓

Design Presentation

# Major Functional Components



**Frontend:**

React.js

**Backend:**

Django

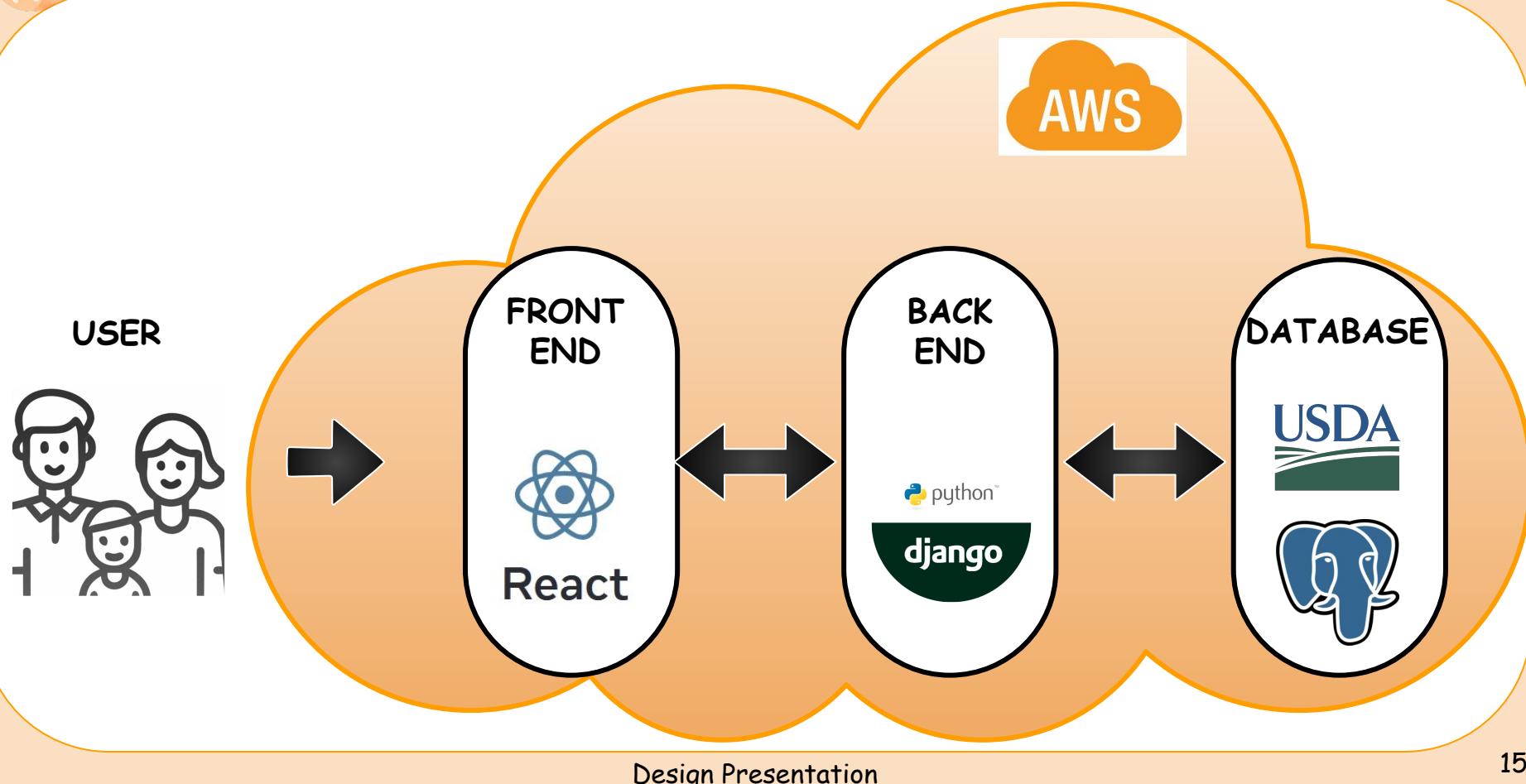
**Database:**

PostgreSQL

**Hosting:**

Amazon Web Services (AWS)

# Major Functional Components Diagram



# Work Breakdown Structure



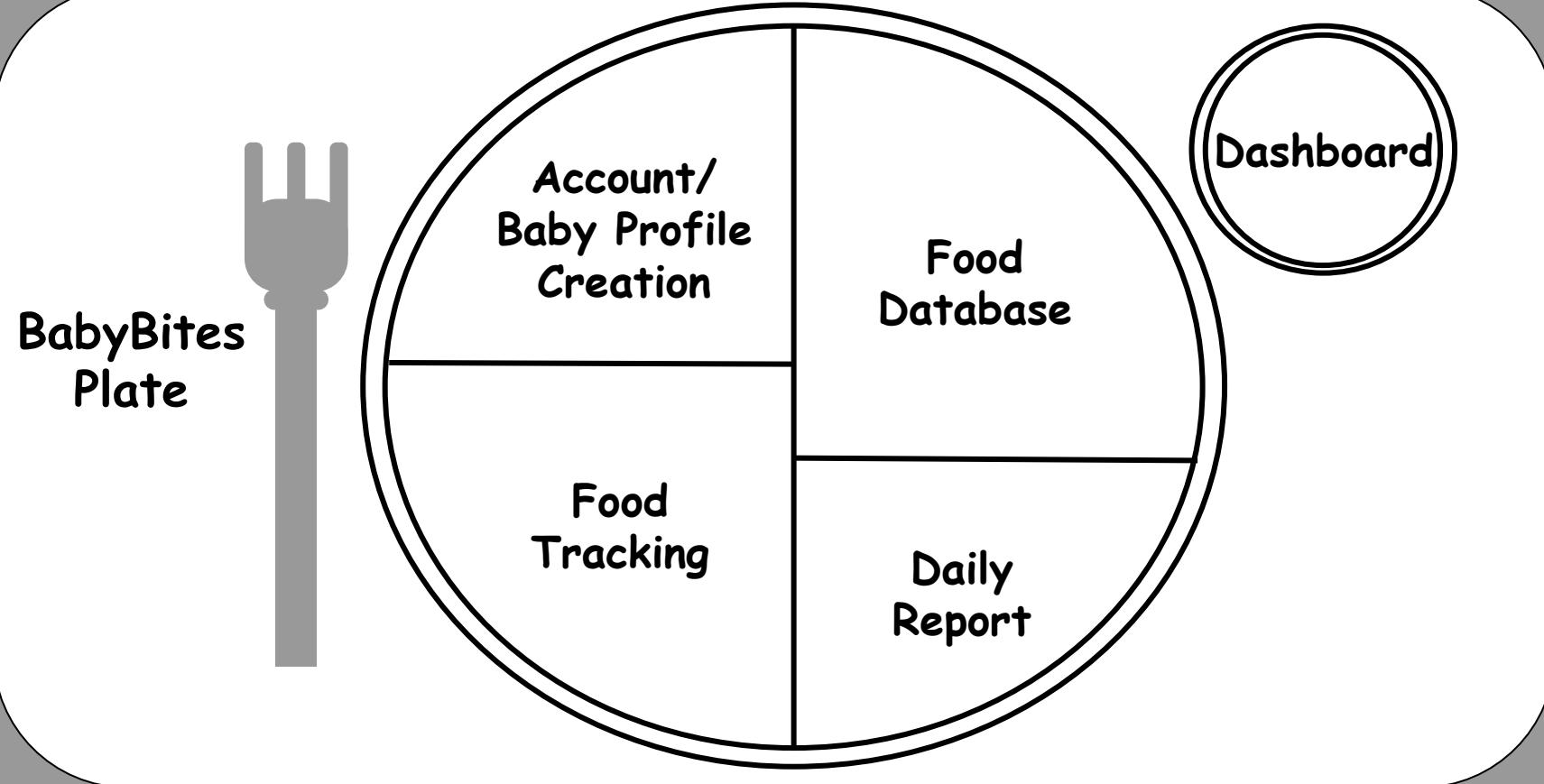
User Interface

Algorithms

Database

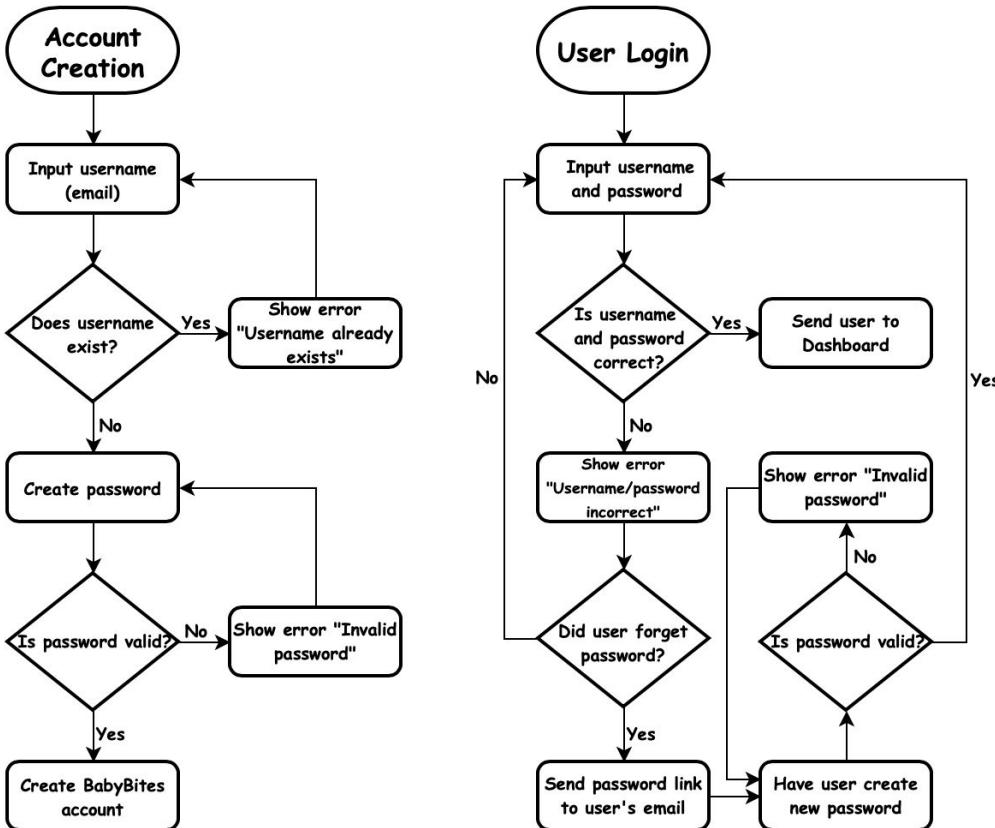
Testing

# Algorithms

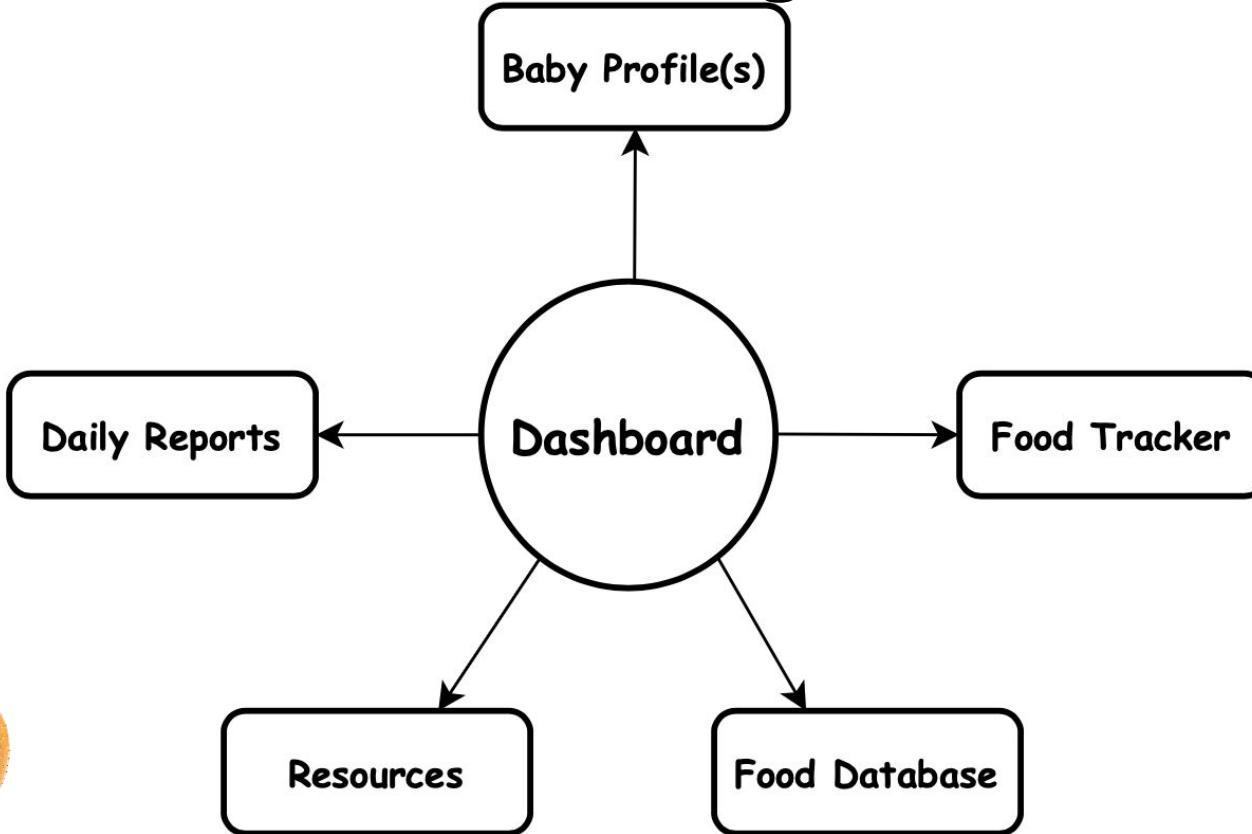




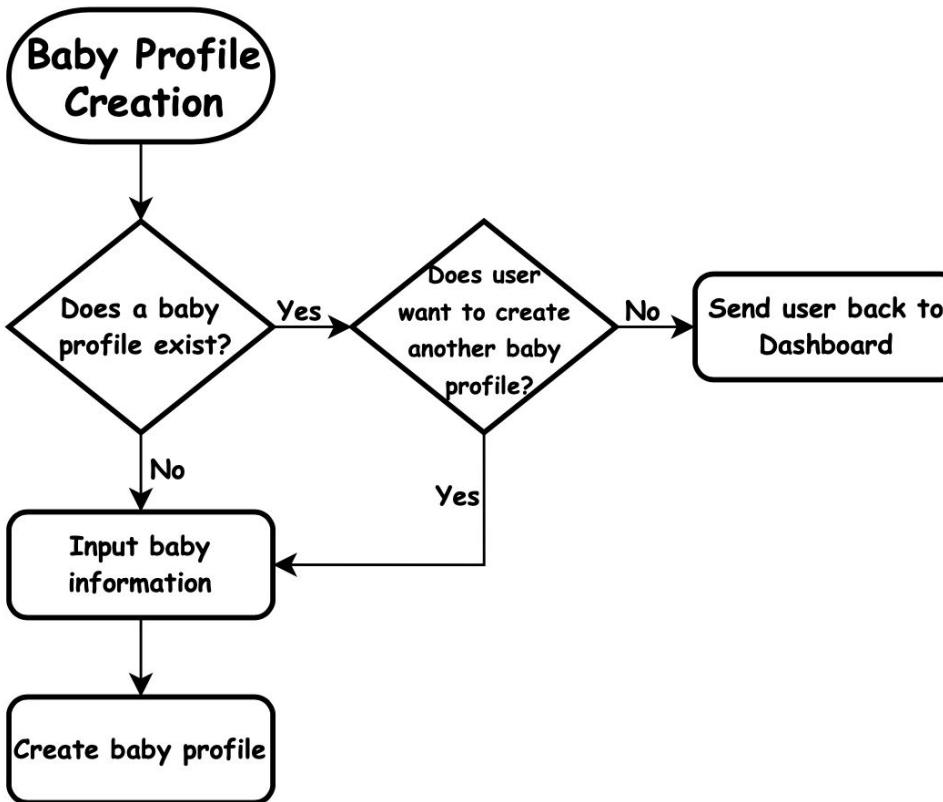
# Account Creation Algorithm



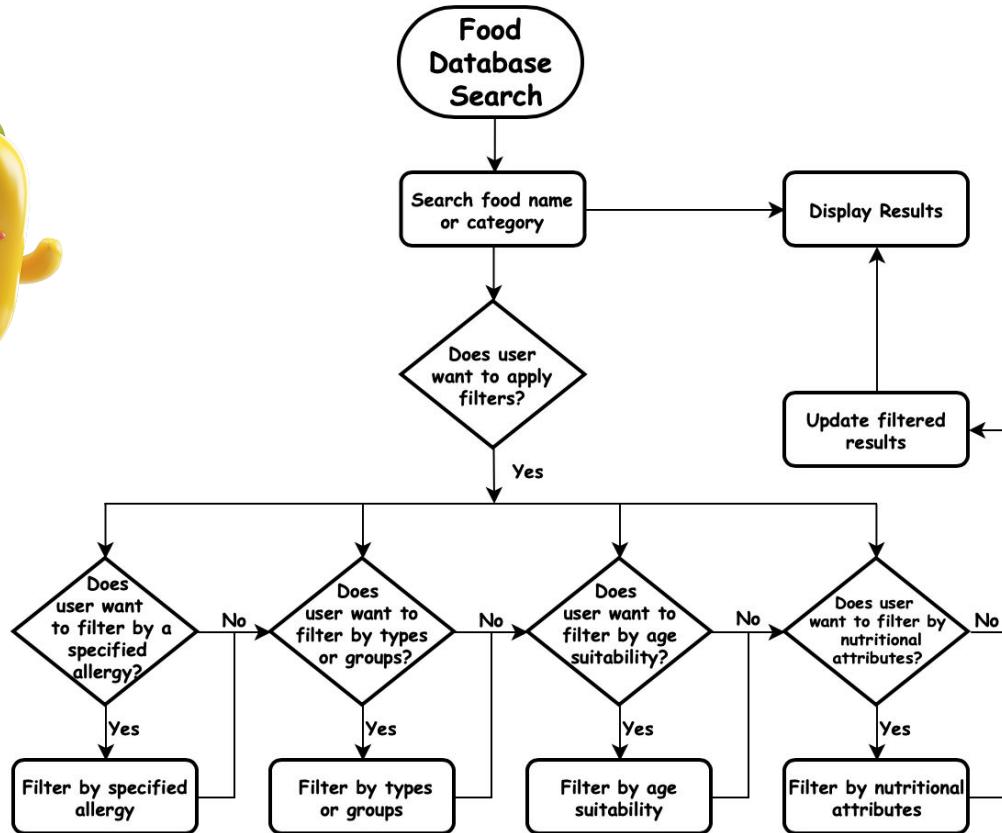
# Dashboard Algorithm



# Baby Profile Creation Algorithm



# Food Database Search Algorithm



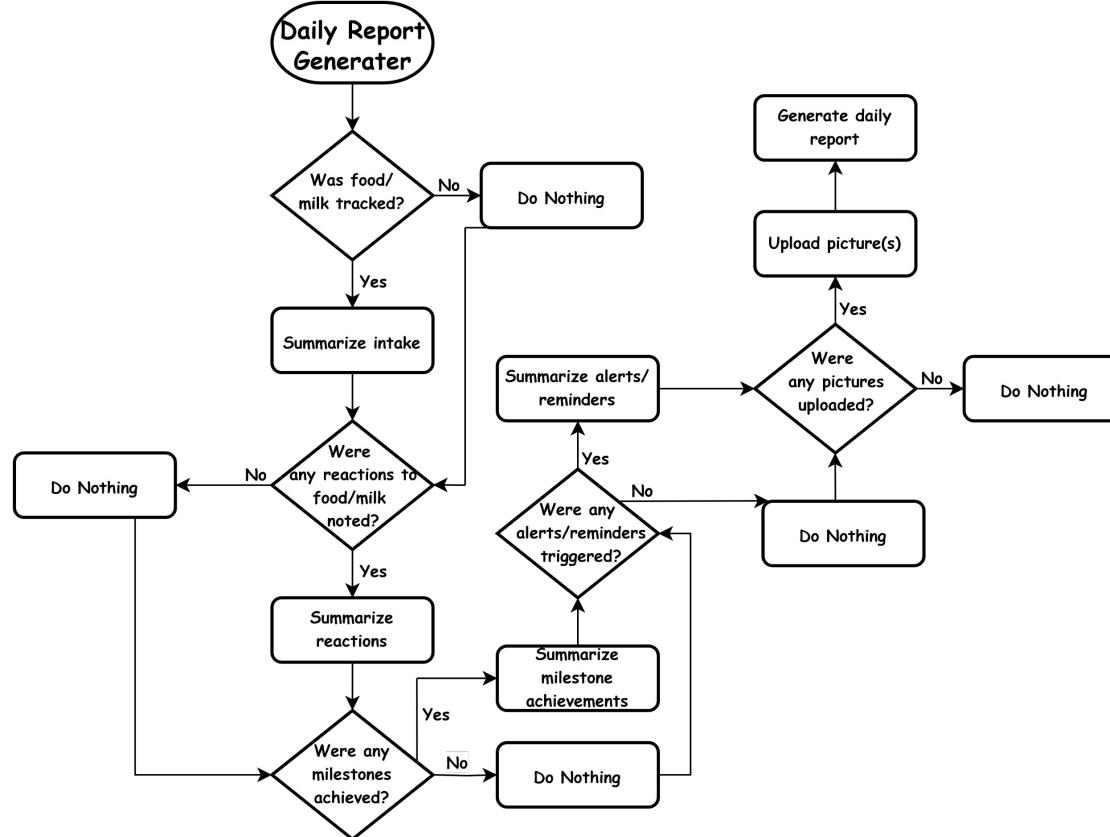
# Food Tracking Algorithm

- 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.



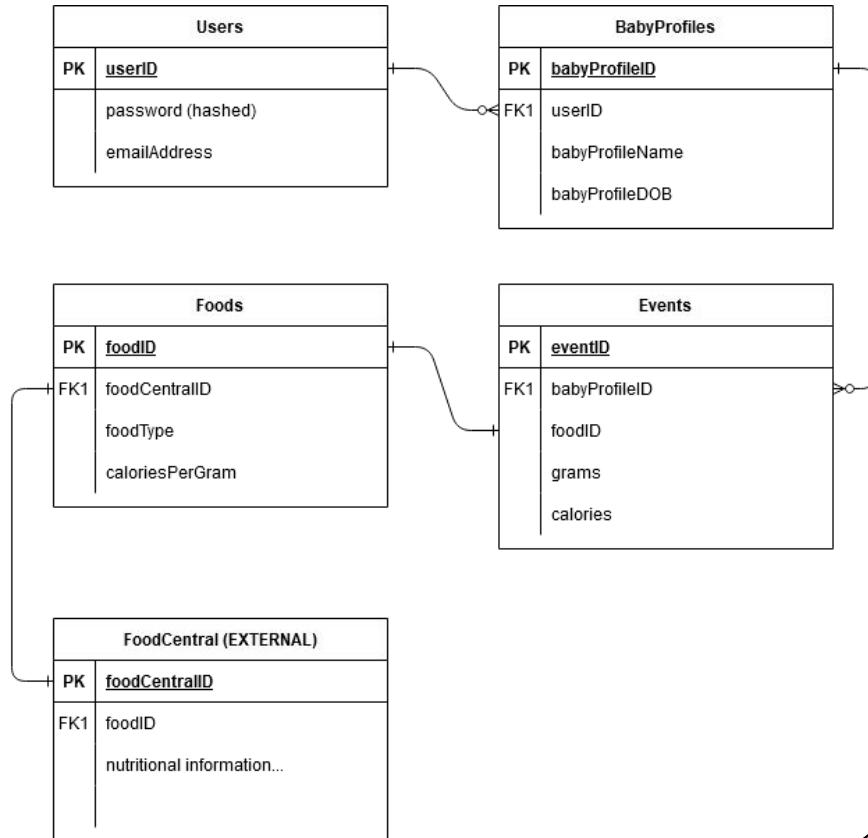


# Daily Report Algorithm

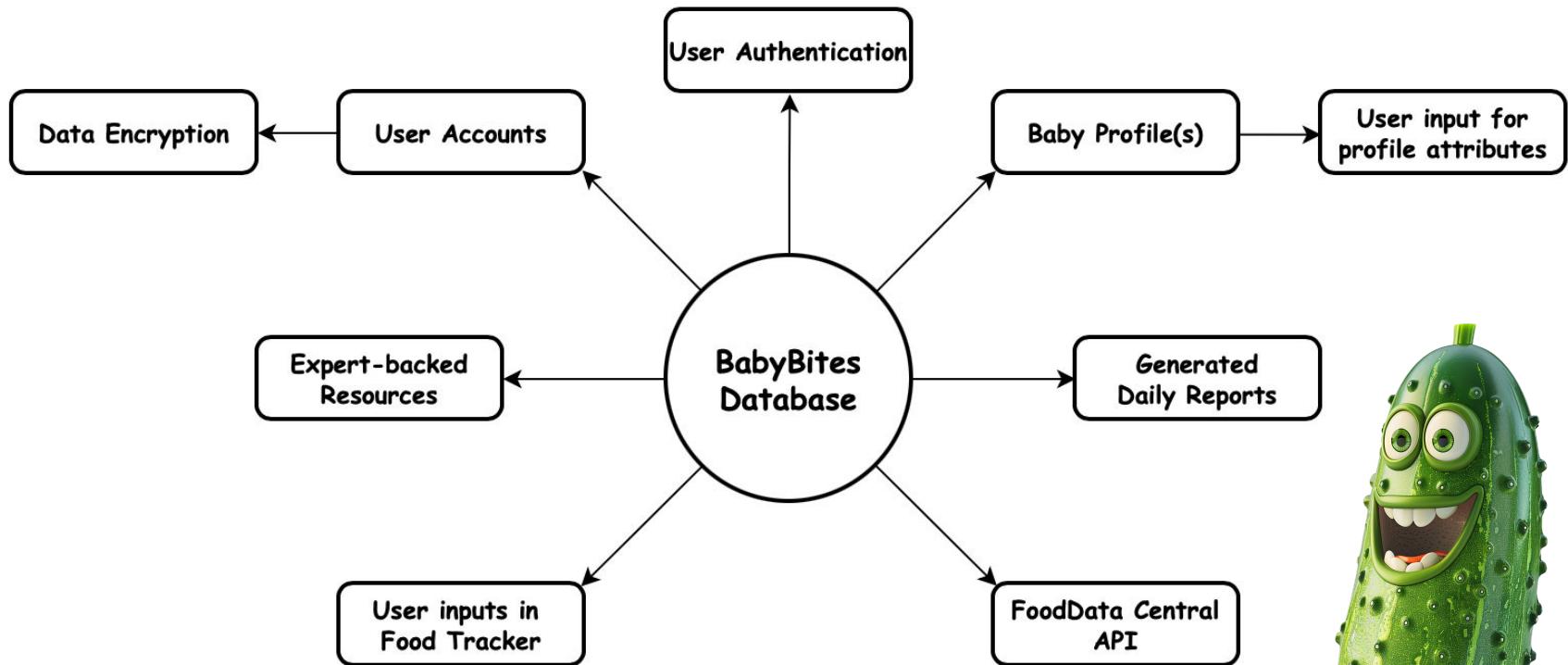


# Database Schema

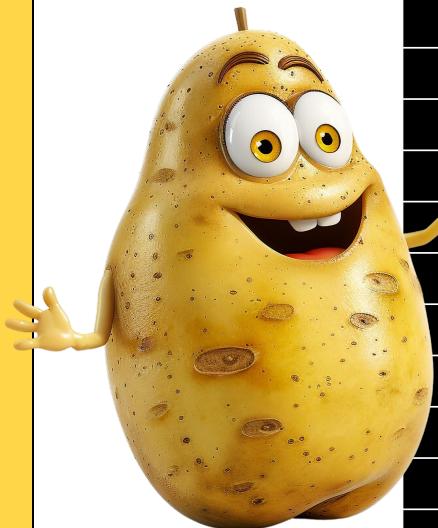
- Data that we need to store:
  - User information
    - User ID
    - Password
    - Email address
  - Baby profiles
    - Users may have many baby profiles, but each baby profile has just one user
  - Events
    - Users will log many events for a baby profile
  - Nutritional information
    - We will 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

Project Management

CI & CD

IDE

Front End

GitHub

Trello

GitHub Actions & Workflows

React

Back End

Database

Testing

Documentation

Hosting

Django

PostgreSQL & FoodData Central API

PyTest & Jest

PyDoc & JSDoc

AWS

# Required Libraries, Tools, & Technologies



**Libraries:** React



**Languages:** Python,  
Javascript, HTML, CSS



**Frameworks:** Django



**Other:** PostgreSQL,  
FoodCentral API

# Development Model

## Agile:

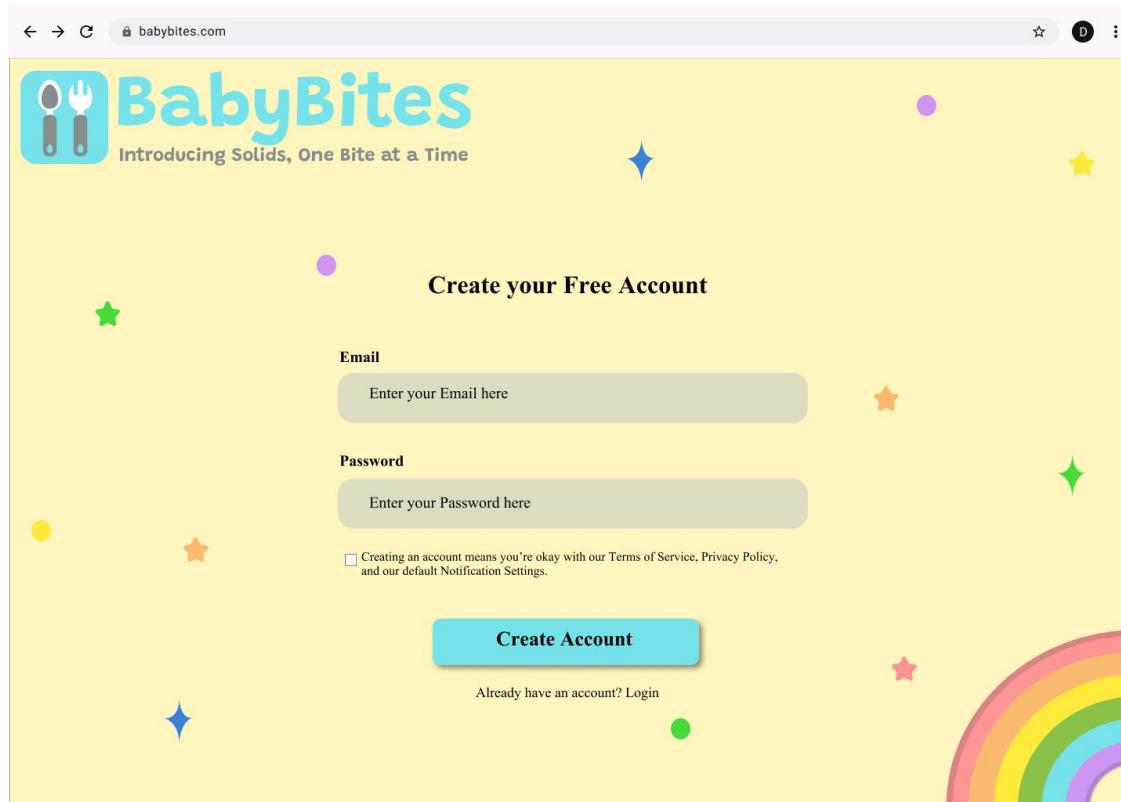
- **Individuals and interactions** over processes and tools
- **Working software** over comprehensive documentation
- **Customer collaboration** over contract negotiation
- **Responding to change** over following a plan

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.

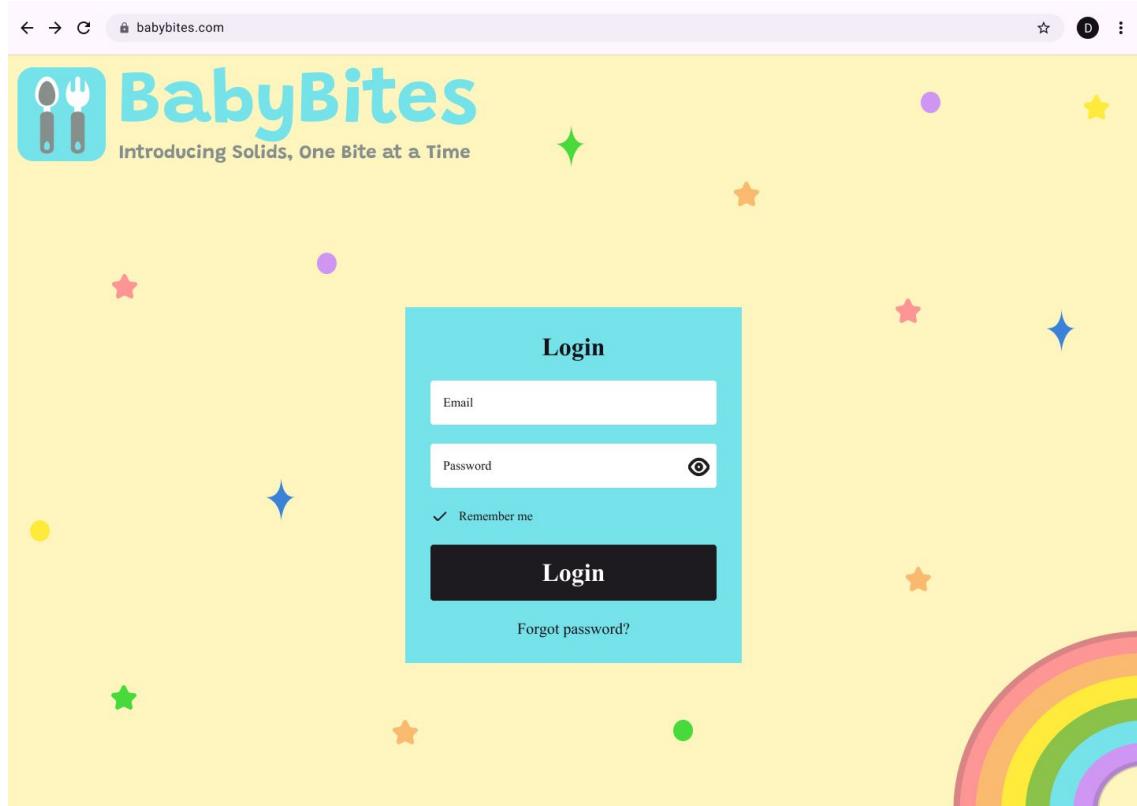
(Cunningham, Manifesto for Agile Software Development 2001)  
(Ward & Bailey, What is Agile Software Development? 2024)



# GUI Mockup - Account Creation



# GUI Mockup - Login



# GUI Mockup - Dashboard



# GUI Mockup - Baby Profile

The desktop version of the Baby Profile application features a central yellow header with the title "BABY PROFILE" in large blue letters. Below the title is a circular profile picture of a baby. To the left is a vertical pink sidebar with a blue icon bar at the top containing a spoon and fork. Below this are five yellow buttons labeled "BabyBites", "Food Tracker", "Food Search", "Daily Reports", and "Resources". At the bottom of the sidebar is a "Logout" button. The main content area includes a "Foods Eaten Today" section listing meals with checkboxes, and two expandable cards for "Name" and "Growth Milestones".

**Foods Eaten Today**

- Mashed Banana . 7:00 am ❤️ Loved it
- Pureed Sweet Pee 9:00am 😊 Okay
- Mashed Avocado 11:00 am 😊 Enjoyed
- Formula 12:00 pm . ❤️ Loved it
- Baby Oatmeal 1:30 pm 😊 Okay
- Formula 3:00 pm ❤️ Loved it

**Name**  
Olivia Rose Thompson

**Date of Birth**  
January 22, 2025

**Age**  
6 months

**Allergies**  
None.

**Pediatrician**  
Dr. Maria James

**Current Weight**  
11 lbs 2 oz

**Growth Milestones**

- First Smile  
March 28, 2025
- First Solid Food  
August 10, 2025
- First Tooth  
coming soon

The mobile version of the Baby Profile application displays a simplified view of the profile information. It includes a circular profile picture of the baby, the name "Olivia Rose Thompson", the date of birth "January 22, 2025", the age "6 months", and the current weight "11 lbs 2 oz". Below this are four rounded buttons for "Food Tracker", "Food Search", "Daily Reports", and "Resources".

**Name**  
Olivia Rose Thompson

**Date of Birth**  
January 22, 2025

**Age**  
6 months

**Allergies**  
None.

**Pediatrician**  
Dr. Maria James

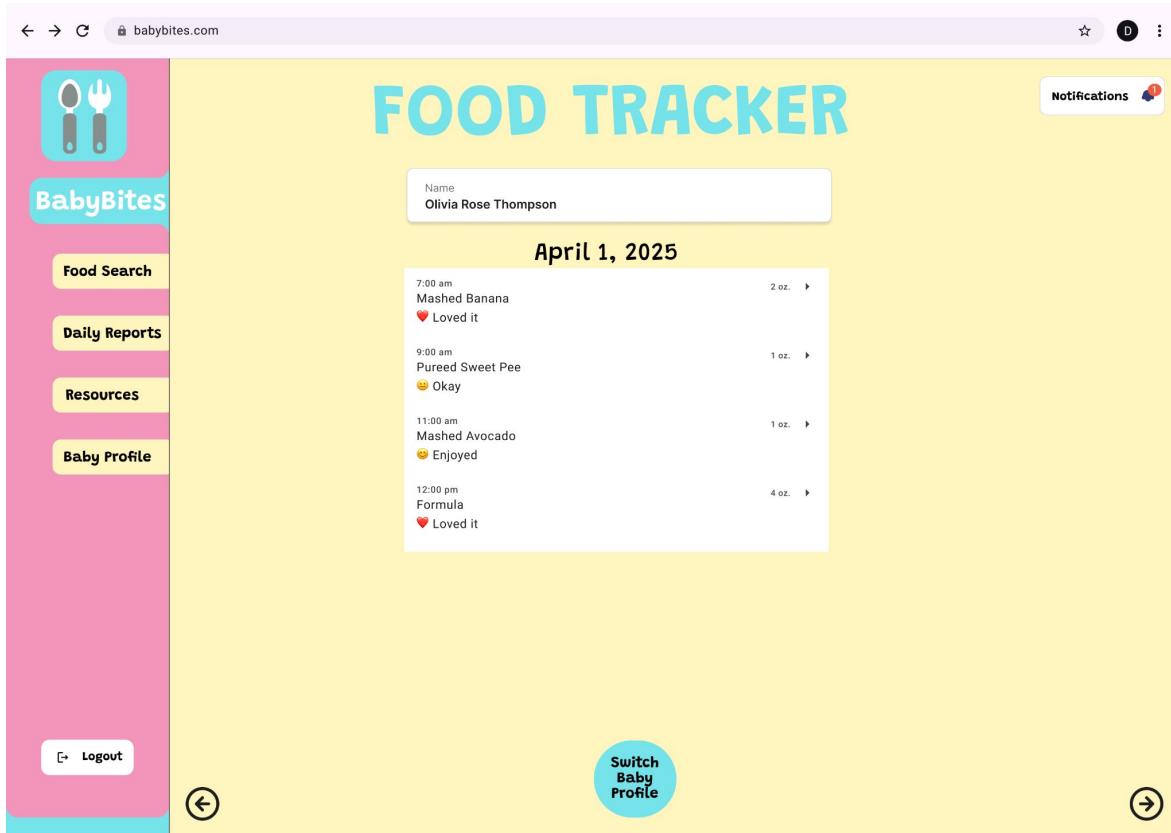
**Current Weight**  
11 lbs 2 oz

# GUI Mockup - Food Search

The screenshot shows a web-based food search interface. On the left is a vertical sidebar with a pink header containing a spoon and fork icon and the text "BabyBites". Below this are buttons for "Food Tracker", "Daily Reports", "Resources", and "Baby Profile". At the bottom is a "Logout" button. The main area has a yellow background and features a large blue "FOOD SEARCH" title at the top. Below it is a search bar with the placeholder "Q Fruits" and a filter icon. A "Notifications" button with a red badge is in the top right. The central part of the screen displays a 3x3 grid of fruit cards, each with an image, the fruit name, and a small red heart icon. The fruits are: Banana, Orange, Apple; Strawberry, Blackberry, Cherry; Kiwi, Watermelon, Pineapple.

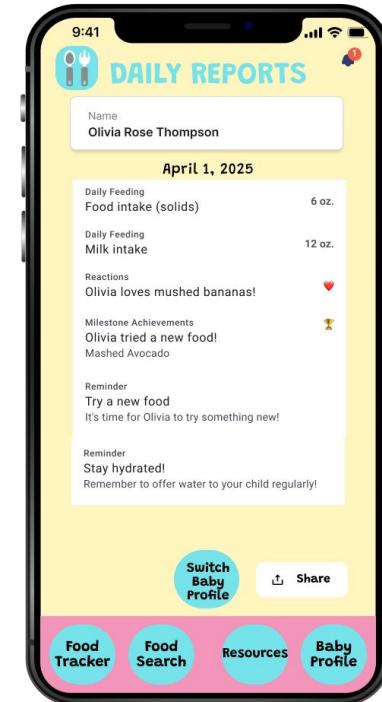


# GUI Mockup - Food Tracker



# GUI Mockup - Daily Reports

The screenshot shows a desktop browser window for [babybites.com](https://babybites.com). The main content area is titled "DAILY REPORTS" in large blue letters. It displays the name "Olivia Rose Thompson" and the date "April 1, 2025". Below this, there are sections for "Daily Feeding" (Food intake (solids) at 6 oz.) and "Milk intake" (12 oz.). A "Reactions" section shows "Olivia loves mashed bananas!" with a heart icon. Under "Milestone Achievements", it says "Olivia tried a new food! Mashed Avocado" with a trophy icon. Reminders include "Try a new food" and "Stay hydrated!". A "Logout" button is at the bottom left, and a "Switch Baby Profile" button is at the bottom right.



# GUI Mockup - Resources

The screenshot shows the 'Resources' section of the BabyBites website. On the left, a vertical sidebar features a logo with a spoon and fork, followed by the 'BabyBites' brand name and four menu items: 'Food Tracker', 'Food Search', 'Daily Reports', and 'Baby Profile'. At the bottom of the sidebar is a 'Logout' button. The main content area has a yellow background and displays four articles with 'Learn more' buttons:

- Tips and Tricks for Proper Nutrition**: Helps your little one grow strong and healthy with expert-backed nutritional guidance.
- Preparing Your Child's Food**: From purées to finger foods, discover how to prepare safe, age-appropriate meals with ease.
- Quick and Easy Recipes**: Simple recipes for every stage, from first tastes to toddler bites.
- Tips for Utensil Usage**: Teach tiny hands to use spoons, forks, and cups with confidence.

A 'Notifications' icon with a red badge is located at the top right of the main content area.

The screenshot shows the 'Resources' section of the BabyBites app interface on a mobile phone. The top navigation bar includes the 'BabyBites' logo, the word 'RESOURCES', and a notification badge. Below the header, there are two columns of cards:

- Preparing Your Child's Food**: From purées to finger foods, discover how to prepare safe, age-appropriate meals with ease.
- Tips for Utensil Usage**: Teach tiny hands to use spoons, forks, and cups with confidence.
- Quick and Easy Recipes**: Simple recipes for every stage, from first tastes to toddler bites.

Each card includes a 'Learn more' button. The bottom of the screen features a pink footer bar with icons for 'Food Tracker', 'Food Search', 'Daily Reports', and 'Baby Profile'.

# 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	S1-M			U1-M	
	Low 2					U2
	Very Low 1			U2-M		

(Risk Management in Software Engineering 2022)

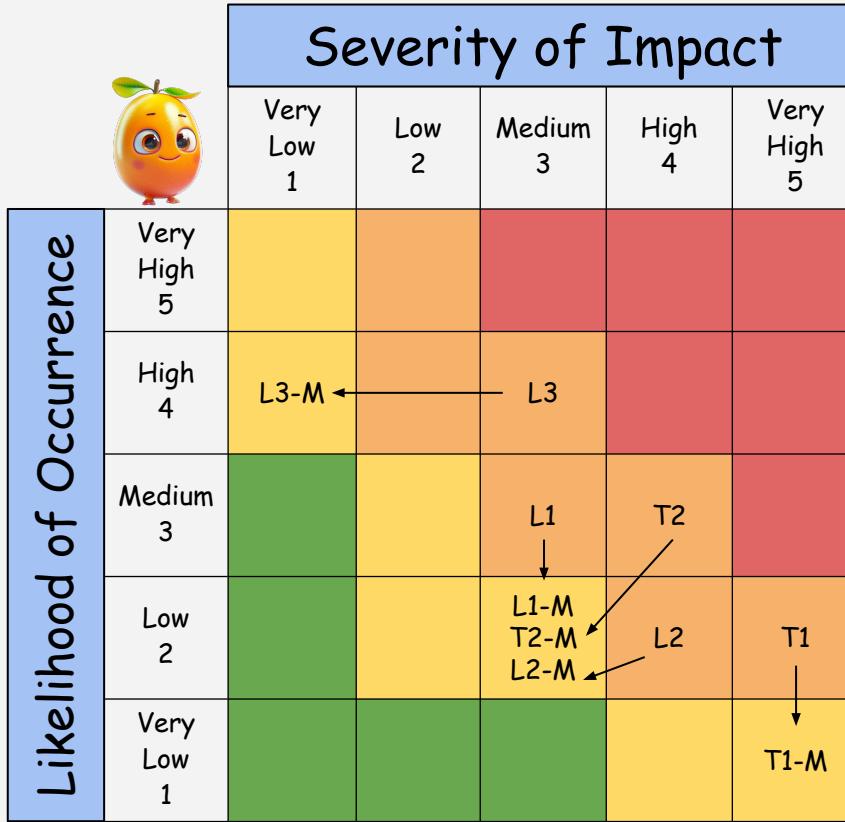
## User Risks:

- 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



(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?

# References

American Academy of Pediatrics. (n.d.). Infant Food and Feeding.

[https://www.aap.org/en/patient-care/healthy-active-living-for-families/infant-food-and-feeding/?srsltid=AfmBOoooqF2B8Yv9QLX0-zkfUPiVyOd7sYSXx\\_IwdNwDXoQY8jWRW96I](https://www.aap.org/en/patient-care/healthy-active-living-for-families/infant-food-and-feeding/?srsltid=AfmBOoooqF2B8Yv9QLX0-zkfUPiVyOd7sYSXx_IwdNwDXoQY8jWRW96I)

Centers for Disease Control and Prevention. (2024, October 10). Choking hazards. Infant and Toddler Nutrition.

<https://www.cdc.gov/infant-toddler-nutrition/foods-and-drinks/choking-hazards.html>

CleanPNG. (n.d.). Amazon Web Services (AWS) logo [Digital image]. Retrieved March 17, 2025, from

<https://www.cleanpng.com/png-amazon-com-logo-amazon-web-services-amazon-elastic-6077407/>

Cunningham, W. (2001). Manifesto for Agile Software Development.

<https://agilemanifesto.org/>

EPAM SolutionsHub. (2022, June 10). Risk Management in Software Engineering.

<https://solutionshub.epam.com/blog/post/risk-management>

EvelynsPearls. (2025). Fruit Clipart Cute Fruit. [Digital art]. Etsy.

[https://www.etsy.com/listing/1690787694/fruit-clipart-cute-fruit-png-cute-food?ref=yr\\_purchases](https://www.etsy.com/listing/1690787694/fruit-clipart-cute-fruit-png-cute-food?ref=yr_purchases)

EvelynsPearls. (2025). Vegetable Clipart Cute Vegetable. [Digital art]. Etsy.

[https://www.etsy.com/listing/1690789328/vegetable-clipart-cute-vegetable-png?ref=yr\\_purchase](https://www.etsy.com/listing/1690789328/vegetable-clipart-cute-vegetable-png?ref=yr_purchase)

Federal Trade Commission. (2013, January 17). Children's Online Privacy Protection Rule (COPPA).

<https://www.ftc.gov/system/files/2012-31341.pdf>

Freepik. (n.d.). Make family icon outline gradient [Digital image].

[https://www.freepik.com/premium-vector/make-family-icon-outline-gradient\\_122127985.htm#from\\_element=detail\\_alsolike](https://www.freepik.com/premium-vector/make-family-icon-outline-gradient_122127985.htm#from_element=detail_alsolike)

Kuo, A. A., Inkelas, M., Slusser, W. M., Maidenber, M., & Halfon, N. (2010). Introduction of Solid Food to Young Infants.

*Maternal and Child Health Journal*, 15(8), 1185-1194.

<https://doi.org/10.1007/s10995-010-0669-5>

# References

- LovelyLovelyScribble. (2025). Kawaii Cute Fruit. [Digital art]. Etsy.  
[https://www.etsy.com/listing/1489955189/kawaii-cute-fruit-png-bundle?ref=yr\\_purchases](https://www.etsy.com/listing/1489955189/kawaii-cute-fruit-png-bundle?ref=yr_purchases)
- Meta. (n.d.). React logo [Digital image].  
<https://react.dev/>
- National Institute of Standards and Technology (NIST). (n.d.). USDA logo [Digital image].  
<https://www.nist.gov/image/usda-logo>
- Norlyk, A., Larsen, J. S., & Kronborg, H. (2019). Infants' transition from milk to solid foods - the lived experiences of first-time parents. *International Journal of Qualitative Studies on Health and Well-Being*, 14(1).  
<https://doi.org/10.1080/17482631.2019.1693483>
- OpenGIS. (n.d.). Django Python logo [Digital image].  
<https://www.opengis.ch/django-python-logo-2/>
- PostgreSQL Global Development Group. (n.d.). PostgreSQL logo [Digital image].  
<https://www.postgresql.org/>
- Refineddigitalbites. (2025). Baby fruits and vegetables. [Digital art]. Etsy.  
[https://www.etsy.com/listing/1704009895/baby-fruits-and-vegetables-22-jpg-images?ref=yr\\_purchases](https://www.etsy.com/listing/1704009895/baby-fruits-and-vegetables-22-jpg-images?ref=yr_purchases)
- Ward, J., & Bailey, D. (2024, December 10). What is Agile Software Development?. Agile Alliance.  
<https://www.agilealliance.org/agile101/>
- World Health Organization. (2023, December 20). Infant and young child feeding.  
<https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>

# Appendix





**Thank You!**