Smart Parenting Assistant

(Software Requirement Specification)

Session: 2022 - 2026

Submitted By:

Fasi-ur-Rehman	2022-CS-71
Ch. Noman Ahmad	2022-CS-91

Submitted to:

Dr. Samyan Qayyum Wahla

Department of Computer Science

University of Engineering and Technology

Lahore Pakistan

Contents

List of Figures

List of Tables

1 Introduction

1.1 Purpose

This Software Requirement Specification (SRS) explains the functional and Non-functional requirements of the Smart Parenting Assistant. This system is designed to help parents in taking care of their children. They can use this app to monitor and compare their child's growth with the WHO standards. They can also use this app to make a personalized sleep schedule for their child. There will be no more confusion in their head about what to feed their child as this app is going to provide them with a personalized nutrition plan. Other than that there is no longer a need to remember the important checkup appointments as this app is going to give you reminders about them.

1.2 Product Scope

This system is specially designed for parents whose children are infants or toddlers. They can use this app to eliminate their confusion about the child's growth and nutrition. They can create an optimized sleep schedule and diet plan according to their child's needs. This can help parents around the globe whose children are between the ages of birth to 3 years.

1.3 Definitions, Acronyms, and Abbreviations

- AI: Artificial Intelligence
- SRS: System Requirements Specification
- Infants: Child within the age bracket of birth to 12 months
- Toddler: Child within the age bracket of 1 year to 3 years
- WHO: World Health Organization
- UI: User Interface
- FR: Functional Requirements
- NFR: Non-Functional Requirements
- Functional Requirements: Specifications that define what the system should do, describing features, behavior, and operations (e.g., user authentication, data processing).
- Non-Functional Requirements: Specifications that define how the system performs its functions, addressing qualities like performance, usability, reliability, and security.

1.4 Problem Statement

For parents it is very difficult to keep track of their child's growth they often think about whether their infant or toddler is growing normally or not. They often think about what should they feed their children over the growing years. This is due to a lack of knowledge about child care. Existing

apps provide information but that information is static it is not personalized for your child. There is a need for software that can help them with their confusion and suggest plans that are personalized for their children, which can help them ease their minds and also help the children to have better growth and mood.

1.5 Document Conventions

This document follows IEEE formatting guidelines. All functional requirements will be labeled as ”F#”, and non-functional requirements as ”NFR#”.

1.6 Document Overview

This document will cover all the functional and non-functional requirements of the system. other than that it will also provide a UI demonstration and will provide the use case for the readers' understandability of how they can use our system.

2 Description

2.1 Product Description

This system will operate independently but its suggestions will align with standard childcare recommendations provided by WHO and child specialists. We will provide a mobile application as well as a web interface so that it can accessed easily on any platform. Parents can use this application for the benefit of their children as well as to ease their minds by eliminating the confusion about nutrition, undergrowth, and sleep patterns. This AI-powered app will help parents to take care of their children more easily and smartly.

2.2 Product Function

The Smart Parenting Assistant includes functionalities for:

- User Registration and Authentication
- Child Profile Management
- Growth and Development Tracking
- Sleep Pattern Monitoring
- Personalized Nutrition Recommendation
- Reminder Management and Notifications
- User Feedback

2.3 Product Users

Target users of this application are parents or any caregiver of infants and toddlers with basic knowledge of using the mobile or web applications.

3 Requirements

The requirement section is divided into two parts first is non Functional Requirements and the second is functional Requirements

3.1 Non-Functional Requirements

Some of the Non-Functional Requirements of this system are given below:

3.1.1 Performance Requirements

NFR1: The system should respond to user inputs within 3 seconds.

3.1.2 Security Requirements

NFR2: This system should make sure that the users' data is like his/her account details and children's profiles should be secured.

3.1.3 Availability

NFR3: Accessible on supported platforms 24/7.

3.1.4 Usability

NFR4: The system should provide a user-friendly User Interface.

3.2 System Features and their Functional Requirement

The features and the functional requirements of those features of Smart Parenting Assistant are given below:

3.3 User Registration and Authentication

This feature of the system allows users to access the application by creating a new account or logging in to the previous one.

- **FR1:** Allow user to create an account on the applications and set up their username and password.
- **FR2:** Allow user to log into their account with the credentials they set up during registration.
- **FR3:** Allow user to reset their credentials in case they forget them.

3.4 Child Profile Management

This feature allows user to create multiple profiles for their children, manage those profiles, and analyze their growth.

- **FR4:** Allow users to create one or more profiles for each of their children.
- **FR5:** Allow users to view the profiles created by them of their children.
- **FR6:** Allow users edit the data of their children profiles.
- **FR7:** Allow users to delete any profile they created.
- **FR8:** Allow users to see a chart or graph of their child's growth.

3.5 Growth and Development Tracking

This feature enables parents to track and monitor the growth of their child and they can also see AI-generated summaries against the standard growth comparison with their child's growth. So that they don't have to think again whether my child's growth is normal or not.

- **FR9:** Allow users to input measurements such as height and weight and then see the AI-generated summary that compares their child's growth with the world standard.

3.6 Sleep Pattern Monitoring

This feature helps parents to monitor and optimize their child's sleep patterns.

- **FR10:** Allow users to log the child's sleep and wake times and then provide personalized suggestions for optimal sleep schedules based on the child's age and needs.

3.7 Personalized Nutrition Recommendation

This feature provides diet suggestions according to each child's age, growth, and dietary needs. Also, it considers the allergies of the child while suggesting the diet.

- **FR11:** Generate personalized meal suggestions based on growth, age, and allergies.
- **FR12:** Display a meal plan for daily or weekly meal suggestions.
- **FR13:** Allow parents to update allergy information to customize meal recommendations.

3.8 User Feedback

This feature allows users to provide feedback on the application's features and performance.

- **FR14:** Enable users to rate individual services like nutrition suggestions, growth monitoring, and sleep pattern suggestions.
- **FR15:** Enable users to write detailed feedback about the overall performance of the system.

3.9 Reminder Management and Notifications

This feature allows users to set reminders about essential things like Feeding time, and checkups. They can set up reminders so that they don't have to forget about important checkups ever again.

- **FR16:** Allow users to set reminders for important tasks such as feeding, naps, and health appointments.
- **FR17:** Allow users to view the set reminders.
- **FR18:** Allow the user to Edit the active reminders.
- **FR19:** Allow user to Delete the active reminders.

4 Use Cases

Use Case 1 - User Registration

Use Case ID	UC01
Name	User Registration
Related Functional Requirement	Functional Requirement 1
Related UI	User Registration
Actor	User
Flow	1. The system allows a new user to create an account. 2. The user enters required details such as name, email, phone, password, and other necessary information. 3. After submission, the system registers the user and creates a new account for access to the application.
Alternative Flow	1. If the entered email or phone already exists, the system displays an error message to use different credentials. 2. If mandatory fields are left empty, the system prompts the user to complete all required information before submitting.
Validators	1. The email format should be valid, and the password must meet the required format (e.g., minimum length, special characters). 2. The system verifies that all required fields are filled before registration submission.

Table 1: Use Case for User Registration

Use Case 2 - User Login

Use Case ID	UC02
Name	User Login
Related Functional Requirement	Functional Requirement 2
Related UI	View Login UI
Actor	User
Flow	1. The system allows an existing user to log in to their account. 2. The user provides their email or phone and password. 3. The system verifies the user's credentials and gives access to the user.
Alternative Flow	1. If the user enters incorrect credentials, the system shows an error message and prompts for re-entry. 2. If the user forgets their password, they can choose the "Forgot Password" option to reset it.
Validators	1. The system ensures that entered credentials match a registered user in the database.

Table 2: Use Case for User Login

Use Case 3 - Reset Password

Use Case ID	UC03
Name	Reset Password
Related Functional Requirement	Functional Requirement 3
Related UI	View Forget Password UI
Actor	User
Flow	1. The system allows a user who has forgotten their credentials to reset password 2. The user enters the one-time password sent to their emails. 3. The user enters the new password. 3. The system changes the password of the user.
Alternative Flow	1. If the user enters the incorrect one-time password, the system shows an error message and prompts for re-entry. 2. If the user doesn't follow the password validations, the system shows the error message and prompts the user to re-enter the password.
Validators	1. The system ensures that entered one-time password entered is the one that the system sent. 2. The password should follow the format (minimum length, special character, etc)

Table 3: Use Case for Resetting Password

Use Case 4 - Create Child's Profile

Use Case ID	UC04
Name	Create Child's profile
Related Functional Requirement	Functional Requirement 4
Related UI	Create Child Profile UI
Actor	User
Flow	1. The system allows User to create the profile of their child. 2. The user enters the required data like the Child's Name, Date of Birth, Gender, Allergies, Weight, and Height. 3. After submission, the system creates a child profile and stores its details.
Alternative Flow	1. If the user leaves any required field empty system gives an error message and prompts the user to enter the information. 2. If the user enters any information wrong system shows an error message and prompts the user to re-enter the information.
Validators	1. Required should not be left empty. 2. There should be no wrong information like name can not be digits and age should not be more than 3 years.

Table 4: Use Case for Adding Child Profile

Use Case 5 - View or delete Child's profile

Use Case ID	UC05
Name	View or Delete Children Profile
Related Functional Requirement	Functional Requirement 5, Functional Requirement 7
Related UI	View and Delete Children Profile UI
Actor	User
Flow	1. The system displays the profiles of children created by the user. 2. User can view the profile of their children. 3. The user can press the delete button. 4. System shows a confirmation message. 5. The user confirms the deletion. 6. The system deletes the child's profile.
Alternative Flow	1. The User presses cancel on the confirmation message. 2. System aborts the deletion. 3. If the system encounters any error during deletion it displays the error message.
Validators	1. Deletion should be confirmed before the profile is permanently removed.

Table 5: Use Case for Deleting Child Profile

Use Case 6 - Update Child's Profile

Use Case ID	UC06
Name	View and Update Child's Profile
Related Functional Requirement	Functional Requirement 5, Functional Requirement 6, Functional Requirement 13
Related UI	Update User Profile
Actor	User
Flow	1. The system displays the profiles of children created by the user. 2. User can view the profile of their children. 3. The user can press the update button. 4. The system shows a modal with the form to update the information. 5. The user changes the required fields and submits. 6. The system prompts user for the confirmation. 7. The user confirms the updation. 8. The system updates the child's profile.
Alternative Flow	1. The User presses cancel on the confirmation message system aborts updation. 2. If the User inputs wrong information then the system shows an error message and prompts the user to re-enter.
Validators	1. Updation should be confirmed before the profile is updated.

Table 6: Use Case Updating Child Profile

Use Case 7 - View chart for child growth

Use Case ID	UC07
Name View chart for child growth	
Related Functional Requirement	Functional Requirement 8
Related UI	View Child growth chart
Actor	User
Flow	1. The system displays a list of child profiles to the user. 2. The user selects a child profile to view the growth chart. 3. The system retrieves and displays the child's growth data (height, weight, etc.) in a graphical chart format.
Alternative Flow	1. If no growth data exists for the selected child, the system displays a message that shows that there is no growth data available and suggests entering initial measurements. 2. If the user does not have any profiles created, the system displays a prompt to create a child profile first.
Validators	

Table 7: Use Case for Viewing Chart for child growth

Use Case 8 - Track growth and development

Use Case ID	UC08
Name Track Growth and development	
Related Functional Requirement	Functional Requirement 9
Related UI	Track Child's growth
Actor	User
Flow	1. The System Allows the user to enter the height, weight, and age of the child. 2. The user enters the information about the child. 3. The system shows the summary of the child's growth and development in comparison with the WHO standards.
Alternative Flow	1. If the user submits the wrong information system shows an error message and prompts the user to enter the correct information. 2. If the system fails to display the summary it will show an error message.
Validators	1. The height, weight, and age fields must contain only valid numerical values. 2. The age value should be within the range appropriate for the application's target age group (e.g., 1 month to 3 years).

Table 8: Use Case for Tracking the child growth

Use Case 09 - Get User Feedback

Use Case ID	UC09?
Name	Get User Feedback
Related Functional Requirement	Functional Requirement 14, Functional Requirement 15
Related UI	Feedback
Actor	User
Flow	1. The system alow the user to give feedback. 2. User write the suggestions in text box. 3. The system saves the suggestion. 4. User gives rating by pressing the stars. 5. The system saves that rating information
Alternative Flow	1. If case of any error the system displays the error.
Validators	1. Validate that rating input is within an acceptable range (e.g., 1-5 stars). 2. Ensure both feedback and rating inputs are saved successfully to the database. 3. Display a success message upon submission, or an error if submission fails. 4. Check if the feedback text length does not exceed the maximum limit.

Table 9: Use Case for Getting User Feedback

Use Case 10 - Add Reminder

Use Case ID	UC10
Name	Add Reminder
Related Functional Requirement	Functional Requirement 16
Related UI	Add Reminder
Actor	User
Flow	1. The system allows the user to add a reminder. 2. The user sets a date by picking a date from the date picker. 3. The system saves the set date. 4. The user sets the time by picking time from the time picker. 5. The system saves set time 6. User selects one type of reminder from the reminder selection box 7. The system saves the selected type of reminder 8. The user presses the add reminder button 9. The system saves the reminder
Alternative Flow	1. If case of any error the system displays the error. 2. If the user does not set any field, the system validates and asks the user to fill the field.
Validators	1. Verify the date and time are valid and not in the past. 2. Display success or error messages based on the save operation outcome.

Table 10: Use Case for Adding Reminder

Use Case 11 - Edit Reminder

Use Case ID	UC11
Name	Edit Reminder
Related Functional Requirement	Functional Requirement 17 , Functional Requirement 18
Related UI	All Reminders
Actor	User
Flow	1. The system allows the user to edit reminders. 2. The user views the reminders. 3. The system displays reminders and gives the option to edit them. 4. The user clicks the pencil icon to edit the desired reminder. 5. The system saves open the window with loaded fields and information 6. The user edits the fields and presses the edit button. 7. The system asks for confirmation. 8. User confirms. 6. The system updates the reminder.
Alternative Flow	1. If case of any error the system displays the error. 2. If the user does cancel the confirmation then the system aborts the operation. 3. if the user enters any wrong input, the system raises an error.
Validators	1. Ensure only valid date and time values are allowed. 2. If confirmation is canceled, ensure no changes are saved.

Table 11: Use Case for Editing Reminder

Use Case 12 - Delete Reminder

Use Case ID	UC12
Name	Delete Reminder
Related Functional Requirement	Functional Requirement 17 , Functional Requirement 18
Related UI	All Reminders
Actor	User
Flow	1. The system allows the user to delete reminders. 2. The user views the reminders. 3. The system displays reminders and gives the option to delete them. 4. The user clicks the minus icon to delete the desired reminder. 5. The system asks for confirmation. 6. User confirms. 7. The system deletes the reminder.
Alternative Flow	1. If case of any error the system displays the error. 2. If the user does cancel the confirmation then the system aborts the operation.
Validators	1. Confirm that the reminder exists before attempting to delete it. 2. If deletion confirmation is canceled, validate that the reminder remains intact.

Table 12: Use Case for Deleting Reminder

Use Case 13 - Personalized Nutrition Recommendation

Use Case ID	UC13
Name	Nutrition Recommendation
Related Functional Requirement	Functional Requirement 11
Related UI	Nutrition
Actor	User
Flow	1. The system gives suggestions to users for nutrition based on the child's data. 2. User sees the suggestion generated by the system.
Alternative Flow	1. If case of any error the system displays the error.
Validators	1. Validate error handling in case recommendation data fails to load. 2. Ensure valid and complete child data is provided before generating a recommendation. 3. Check that the nutrition recommendation is tailored based on the child's data.

Table 13: Use Case for Getting Personalized Nutrition Recommendation

Use Case 14 - Sleep Pattern Monitoring

Use Case ID	UC14
Name	Sleep Pattern Monitoring
Related Functional Requirement	Functional Requirement 17
Related UI	Sleep Pattern Monitoring
Actor	User
Flow	1. The system allows users to monitor the sleep patterns of children. 2. User gives detailed information about his/her child's sleep pattern. 3. The system generates the result or suggestion for improving the sleep of the child.
Alternative Flow	1. If case of any error the system displays the error. 2. If the user is unsatisfied with the generated response the system will encourage the user to enter more information.
Validators	1. Verify that the child's sleep data is complete and within acceptable input ranges. 2. Ensure suggestions are generated based on the provided sleep pattern data. 3. Display error or feedback messages to guide user input if data is incomplete or inaccurate.

Table 14: Use Case for Sleep Pattern Monitoring

5 UI Interfaces

User Registration

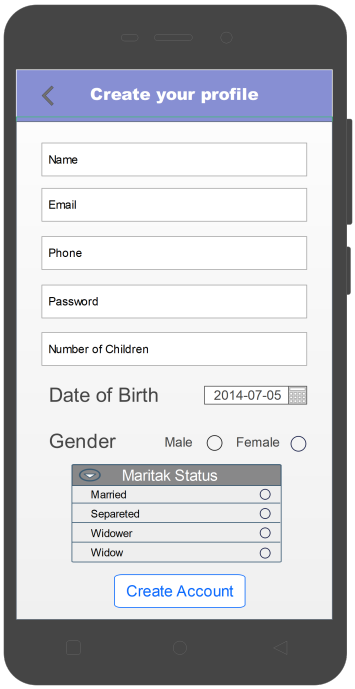

Figure 1: User Registration

User Log In

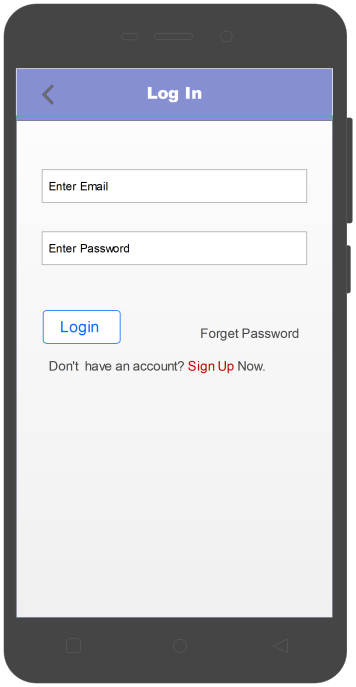

Figure 2: User Log In

Forget Password

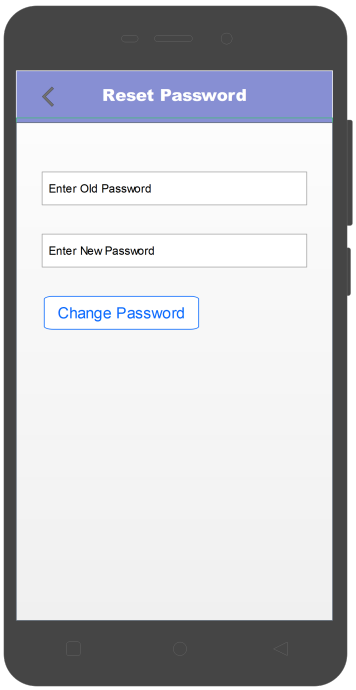

Figure 3: Forget Password

Add Child

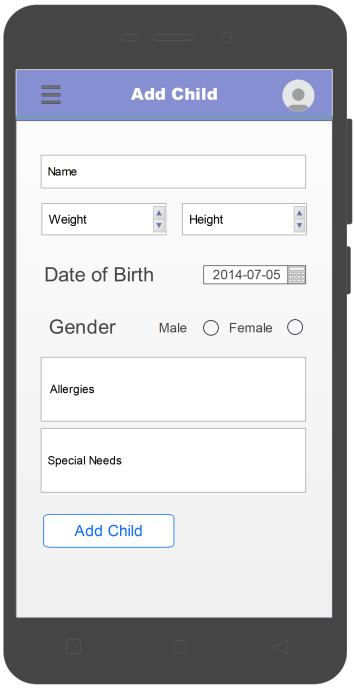

Figure 4: Add Child

Manage Children

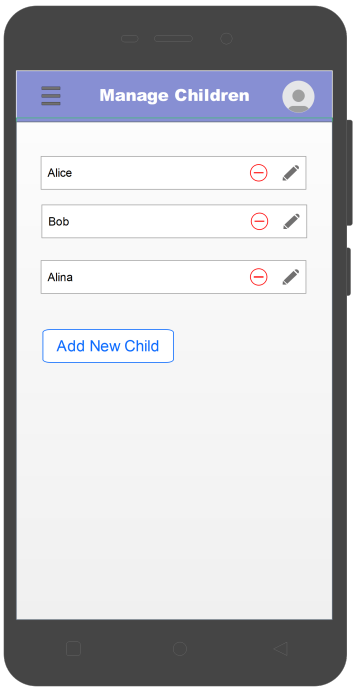

Figure 5: Manage Children

Child's Growth and Development

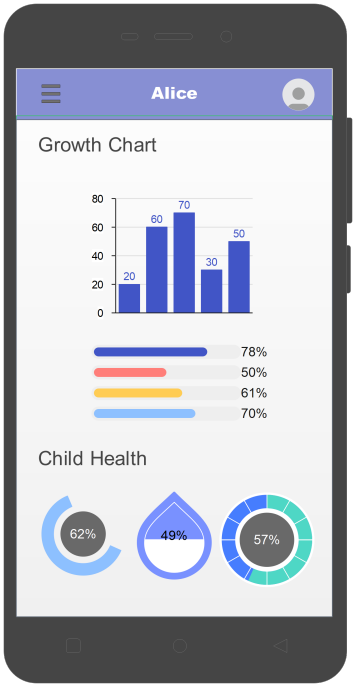

Figure 6: Child's Growth and Development

Child's Growth and Development against WHO standards

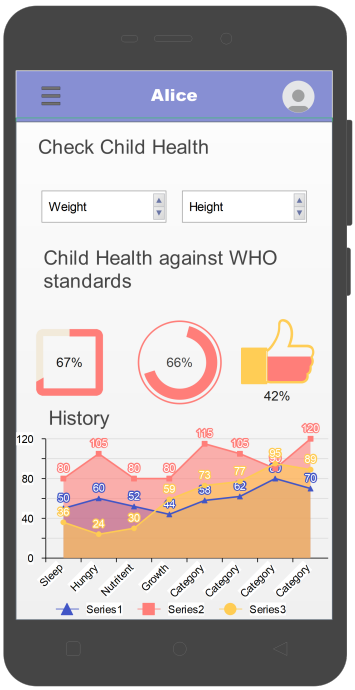

Figure 7: Track child growth

Sleep Pattern Monitoring

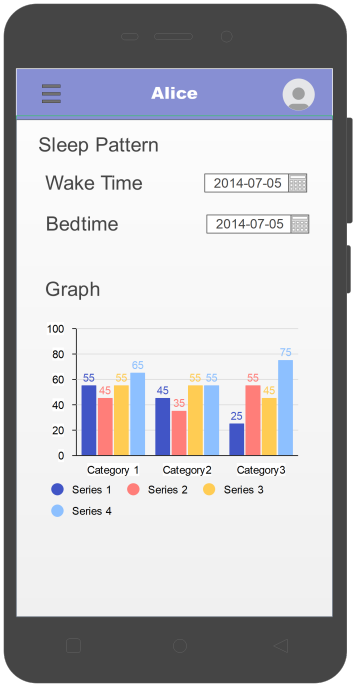

Figure 8: Sleep Pattern Monitoring

Feedback

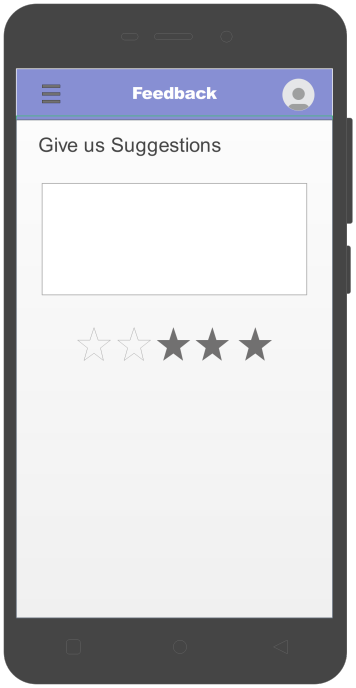

Figure 9: Feedback

Add Reminder

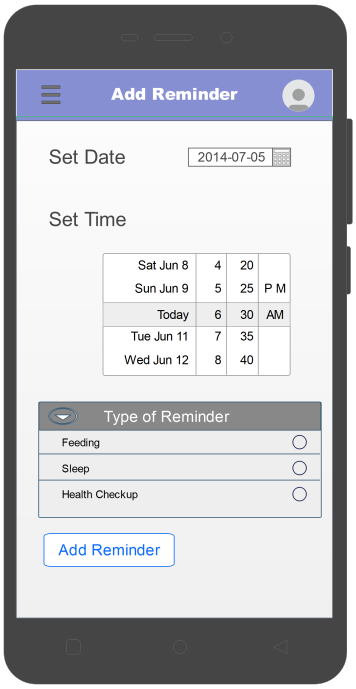

Figure 10: Add Reminder

All Reminders

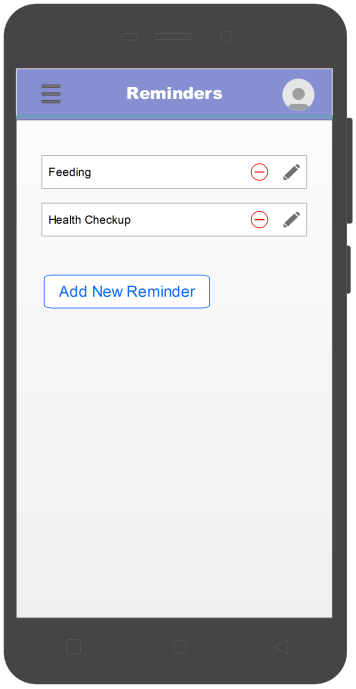

Figure 11: All Reminders

Nutrition

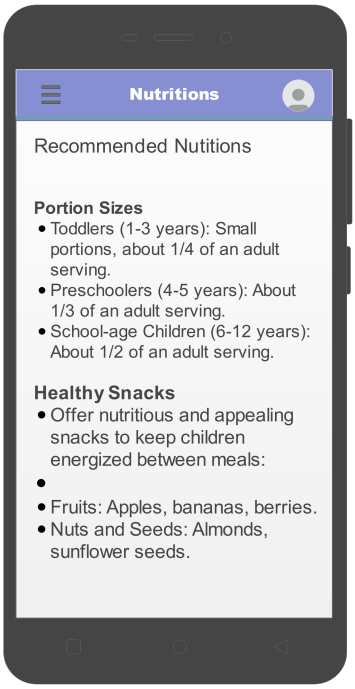

Figure 12: Nutrition

6 Conclusion

The Smart Parenting Assistant aims to provide parents with a supportive, AI-driven tool for tracking and enhancing child development. This Software Requirements Specification (SRS) has outlined all functional and non-functional requirements to guide the design, implementation, and deployment of the system. By offering features like personalized growth monitoring, sleep schedule optimization, nutrition recommendations, and reminder management, this application helps parents make informed decisions for their children's well-being.

With a user-centered design and alignment with WHO standards, the Smart Parenting Assistant ensures reliable, safe, and effective support tailored to each child's needs. The system's integration of both functional and non-functional requirements enables a practical solution that balances performance, security, and usability. This document provides the foundational guidelines necessary for developing a comprehensive and scalable tool that contributes to positive parenting experiences worldwide.