
Software Requirements Specification

for

<ChildConnect>

Version 1.0 approved

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SCEZ Group4

<10/04/2025>

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Revision History

| Name | Date | Reason For Changes | Version |
|------------------------------|------------|--------------------|---------|
| Wee Zi Hao (Huang Zi Hao) | 10/04/2025 | Initial Commit | 1.0 |
| Sivaguruanathan Keerthivasan | 10/04/2025 | Initial Commit | 1.0 |

1. Introduction

1.1 Purpose

This document outlines the software requirements for “ChildConnect, Version 1.0”. ChildConnect is a mobile application that bridges the gap between Teachers and Parents to ensure seamless communication and collaboration for the safety and well-being of every child. This SRS will outline the full functionalities, features and constraints of this platform and aims to provide onboarding and current developers a complete overview of the application to refer to. This document was made after extensive discussion with stakeholders (group members). This document will encompass the entire application and is to be strictly followed during the development, testing and maintenance phase to ensure proper alignment with the project’s objectives. Refer to this document as a strict guideline whenever in doubt. Should any uncertainties arise, discuss them with the project manager and ensure that this document is updated to reflect the clarifications.

1.2 Document Conventions

To ensure clarity and consistency, this document will be following these documentation conventions.

- Font Styles: “Arial” for normal text, “Times” for headers
- Font Size: “11” for normal text, “18” for headers, “14” for subheaders
- Text Styling: “**Bold**” text indicates key terms, “*Italics*” indicate emphasis
- Line Height: Kept to “1.15” throughout
- Align: Kept to “Left align” throughout
- Language: UK English format, also known as British English which Singapore largely utilises

Requirement prioritisation: To avoid unnecessary repetition and for ease of reading, higher-level requirements are assumed to be inherited by detailed requirements

Version control: We will adopt a versioning scheme starting from 0.x (e.g., 0.1, 0.2, 0.3) to indicate draft or development stages. The version will incrementally progress until 1.0, which will represent the final release.

1.3 Intended Audience and Reading Suggestions

This SRS is structured into different parts for ease of readability for different stakeholders. The general structure of the SRS will be as follows:

Part 1 (Introduction): This section aims to provide a general overview of the ChildConnect project consisting of administrative information including Purpose, Documentation Conventions, Intended Audience and Reading Suggestions, Product Scope and References.

Part 2 (Overall Description): This section aims to provide a more detailed overview of the ChildConnect project with higher-level information including Product Perspective, Product Functions, User Classes and Characteristics, Operating Environment, Design and Implementation Constraints, User Documentations and Assumptions and Dependencies.

Part 3 (External Surface Requirements): This section aims to provide a general structure of our Graphical User Interface (GUI) including User Interfaces, Hardware Interfaces, Software Interfaces and Communication Interfaces.

Part 4 (System Features): This section aims to provide low-level detailed information of our project, going in depth for each System Feature.

Part 5 (Other Non-Functional Requirements): This section aims to provide an overview of the non-functional requirements of ChildConnect including Performance Requirements, Safety Requirements, Security Requirements, Software Quality Attributes and Business Rules.

Part 6 (Other Requirements): This section provides an overview for requirements that were not covered previously. Examples of this will include database requirements, internationalisation requirements and legal requirements.

Part 7 (Appendix): This section provides additional information including Glossary and Analysis Models that may be useful to readers and stakeholders who are onboarding into this project.

This SRS is suitable for **ALL** stakeholders to read. We recommend reading the following for the different stakeholders.

- Project Managers/Investors - We recommend beginning with Introduction and Overall Description before moving to external Interface Requirements to get a feel for how the whole application works at a high level.
- Developers - We recommend beginning with the introduction before skipping to either External Surface Requirements for frontend developers or System Features for backend developers to onboard onto the project in the least amount of time.
- Marketing Staff - We recommend you first read the Introduction before skipping straight into External Surface Requirements so that you have a feel for how the product works to best market it.
- Users - Likewise we want you to get excited about our product and its capabilities so our recommended reading would be Introduction and External Surface Requirements
- Testers - Reading the Introduction and going straight into System Features and Other Non-Functional Requirements will get you started with your testing phase
- Documentation Writers - Reading the introduction is sufficient.

1.4 Product Scope

ChildConnect is a mobile application designed to bridge the gap between Parents and Teachers for the safety and well-being of their children. The primary goal of ChildConnect is to provide a platform that facilitates communication between Parents and Teachers regarding information of a Child's commute between home and school, as well as their attendance, grades, homework and other administrative matters within the school environment. We aim to be a lightweight school management application that aligns with the Singapore Ministry of Education's mission of being committed towards raising our young well and developing them to their full potential through increased care as well as getting parents more involved with their Children.

1.5 References

NIL

2. Overall Description

2.1 Product Perspective

ChildConnect is a school management application that is designed specifically for parents and teachers in Singapore. ChildConnect utilises the School Directory and Information Application Programming Interface (API) provided on Data.Gov by MOE to enable Parents to query for the most updated and reliable school information straight from the government. Basing our application around this government API is crucial as it provides assurance that the communication service we provide between parent and teacher is reliable and genuine. Our application would be especially useful for parents who have multiple children from different schools as they can all be managed on the same application. Our application would also provide accessibility features for communication with parents whose primary language may not be english. We also provide accessibility features for those who find it difficult to type on a mobile keyboard and those who may have difficulty viewing words on a phone.

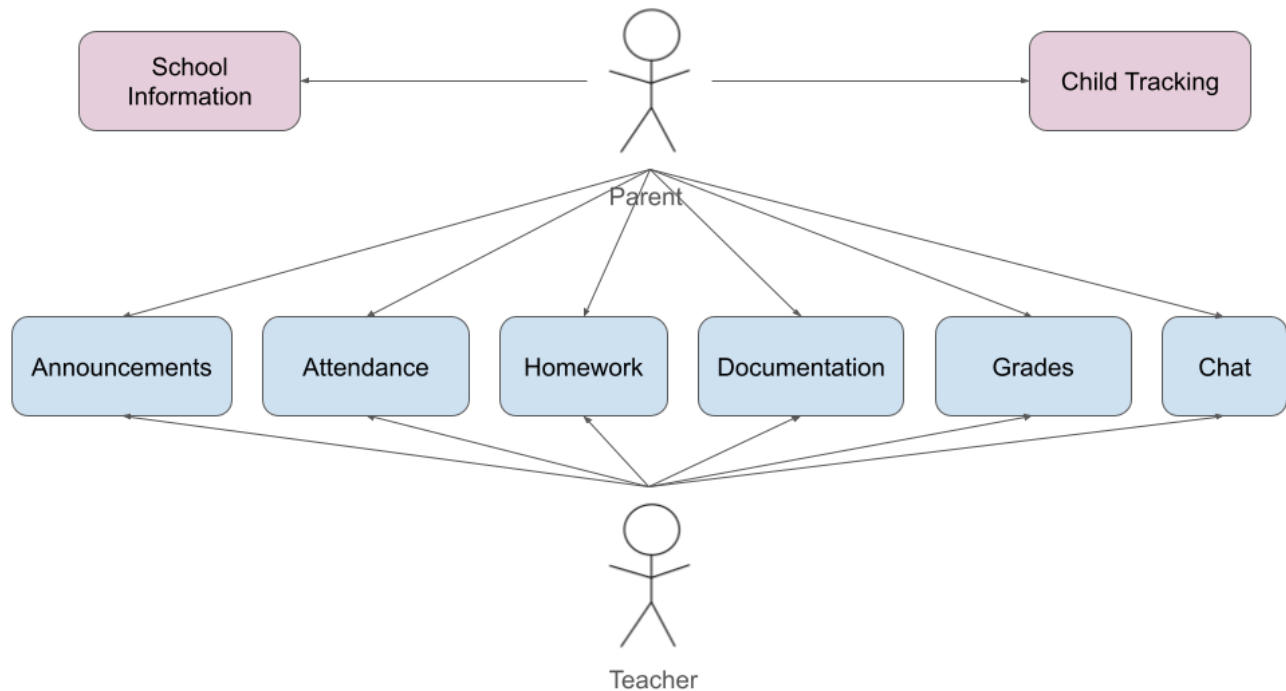
2.2 Product Functions

There are 8 main functions for ChildConnect. These include

- Chat
- School Information
- Child Tracking
- Homework
- Documentation
- Announcements
- Attendance
- Grades

As a whole, these features are used for Teachers to communicate different types of information with the Parent (With the exception of School Information and Child Tracking)

The diagram below illustrates the different features we have at an **extremely high level**. Red boxes indicate a feature unique to the parent while Blue boxes indicate features that are shared among the two different user roles.



2.3 User Classes and Characteristics

ChildConnect supports three primary user classes: Parents, Teachers, and Children. Parents and Teachers are most critical as they interact with the system most frequently and rely on its core functionality to communicate.

Parents typically access the system to stay informed about their child's activities. They use features like viewing homework, announcements, attendance records, grades, and documents. A key function unique to this group is child location tracking. Parents can activate tracking, view real-time coordinates to constantly monitor their child. Parents also use chat features to communicate directly with teachers.

Teachers are responsible for managing content such as assigning homework, uploading documentation, grading tests, and marking attendance. They have access to classes they oversee, and are able to manage announcements and initiate communication with parents through the chat system.

Children is an extremely restricted user class with minimal interface complexity. They interact with the system primarily in "Child Mode", a secure environment that shows homework and allows for GPS tracking. This role is protected by an exit PIN to prevent unauthorized actions and ensure safety.

Role-specific login and access control is ensured through our authentication system which utilises Firebase to dynamically render navigation and views based on user role.

2.4 Operating Environment

Device compatibility: The mobile application will be able to run on both IOS and Android devices for mobile use.

- Minimum iOS version: iOS 13.0 or later
- Minimum Android version: Android 8.0 (API level 26) or later
- Responsive design adapts to various screen sizes (Not limited to smartphones)

Additional code needed to interact with our custom Google translation microservice that we created will be hosted on the Google Cloud Platform.

An active internet connection is required for

1. Firebase authentication
2. Real-time location tracking
3. Data synchronisation with backend
4. Media upload/download
5. Translation and speech services

Note that the backend needs to be containerised and run on a cloud server. Localhost does not work since the IP addresses of your computer (running the backend) and mobile device (running the frontend through Expo Go) would be different (Unless you hardcode the IP address every time).

2.5 Design and Implementation Constraints

The following constraints serve to guide the design and implementation of ChildConnect software.

2.5.1 Frontend frameworks/constraints

The user interface was developed using React-Native under the Expo framework to ensure easy testing and programming (Using Expo router). Nativewind styling library enables us to utilise Tailwind CSS in our project for easy and consistent styling. TypeScript was chosen over JavaScript due to its static (strong) type-checking capabilities, which increases code reliability and detects type-related errors at compile time, contributing to improved maintainability and robustness of the application.

2.5.2 Backend frameworks/constraints

The backend server will be developed using FastAPI due to our team's familiarity with Python coupled with its high performance features and ease of usability. Its support for automatic documentation generation and asynchronous operations aligns well with our project for future maintenance and scalability.

2.5.3 Database frameworks/constraints

The database will be made using Google's Cloud Firestore which is a NOSQL database. The NOSQL database was specifically chosen to support images and documents within our system. Additionally, Firestore was selected due to scalability and real-time data synchronisation capabilities which is crucial to ensure the safety of a child through our child tracking system.

2.5.4 Cloud Services - Google Cloud Run

To support language translation functionality and other audio and text conversion functions, a dedicated microservice has been implemented using Google Cloud Run. This microservice is implemented as a standalone Node.js script to interact with the Google Cloud Translation API. This makes this translation API reusable for future development whilst being containerised on a serverless environment.

2.6 User Documentation

<List the user documentation components (such as user manuals, on-line help, and tutorials) that will be delivered along with the software. Identify any known user documentation delivery formats or standards.>

2.7 Assumptions and Dependencies

2.7.1 Assumptions

The user has a suitable mobile device (Refer to Operation Environment 2.4) that has an internet connection at all times.

2.7.2 Dependencies

A list of libraries and dependencies are required and as follows:

2.7.2.1 Frontend Dependencies

| Library | Purpose |
|--------------------------------|----------------------------------------------------|
| React | Core library for building user interfaces |
| React Native | Framework for building native mobile apps |
| Expo | Framework and platform for universal React apps |
| Expo Router | File-based routing for navigation in Expo apps |
| NativeWind | Tailwind CSS styling for React Native |
| react-native-gifted-charts | For pie charts and data visualisation |
| react-native-maps | To display maps and location tracking |
| react-native-calendars | To render attendance calendar views |
| react-native-progress | To show progress bars and loading indicators |
| react-native-safe-area-context | To handle safe area insets across devices |
| react-native-webview | To render PDFs and web content inside the app |
| lucide-react-native | Icon set for consistent UI visuals |
| @expo/vector-icons | Icon set used throughout the app |
| moti / AnimatePresence | For smooth UI animations and transitions |
| expo-document-picker | Allows document selection from device storage |
| expo-image-picker | Allows users to pick images from gallery or camera |
| expo-file-system | For file reading and writing operations |
| expo-av | To enable audio recording and playback |
| expo-location | To fetch device location data |
| @react-navigation/native | Navigation management across screens |
| react-native-slider | Used to input test scores interactively |
| react-native-gesture-handler | Enables complex gestures in UI |
| expo-linking | To open external URLs or handle deep links |

2.7.2.2 Backend Dependencies


| Library | Purpose |
|--------------------|-----------------------------------------------------|
| FastAPI | Backend server framework (Python) for handling APIs |
| Firebase Admin SDK | Used on backend to manage Firebase services |

2.7.2.3 Cloud & External Services

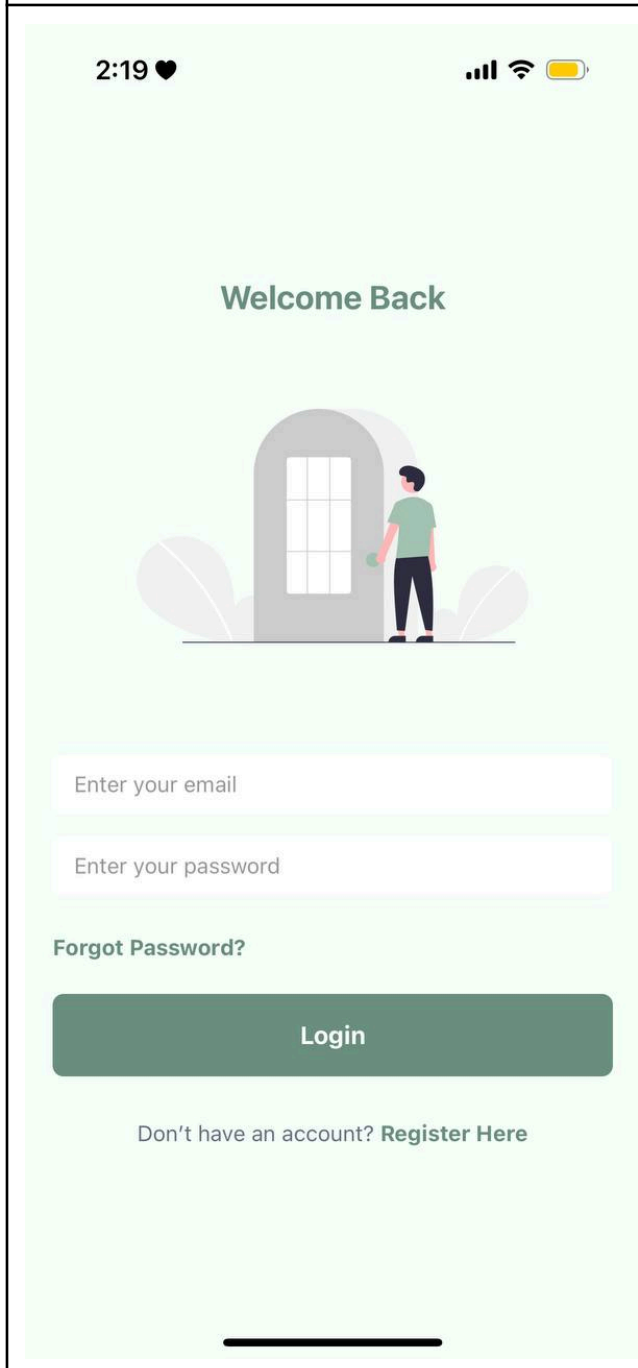
| Library | Purpose |
|------------------------------|--------------------------------------------------|
| Firebase Authentication | To manage user login and account access |
| Firebase Firestore | Cloud-hosted NoSQL database for storing app data |
| Firebase Storage | Used for file uploads to Firebase |
| Cloudinary | To manage and store user-uploaded media assets |
| Google Cloud Translation API | To translate messages across languages |
| Google Cloud Speech-to-Text | To transcribe recorded speech into text |
| Google Cloud Text-to-Speech | To convert text messages to spoken audio |

3. External Interface Requirements

3.1 User Interfaces

| 3.1.1 Welcome Page | |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none">• The welcome page consists of an image and a short description of our application.• The welcome page also consists of a “Get Started” button whereby users will be able to navigate to our Login Page |

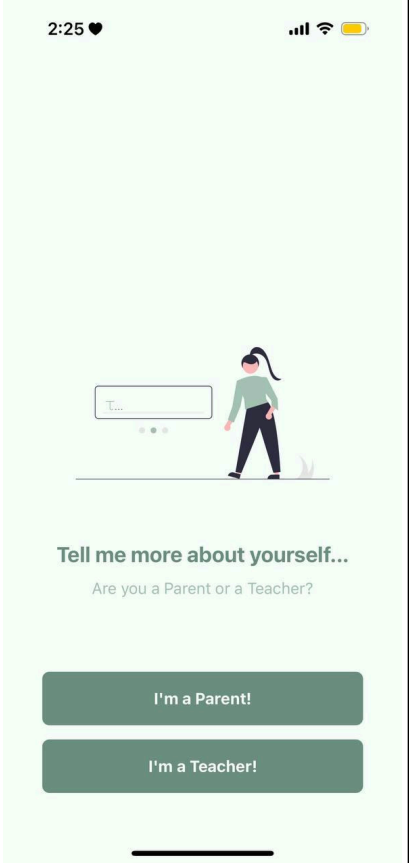

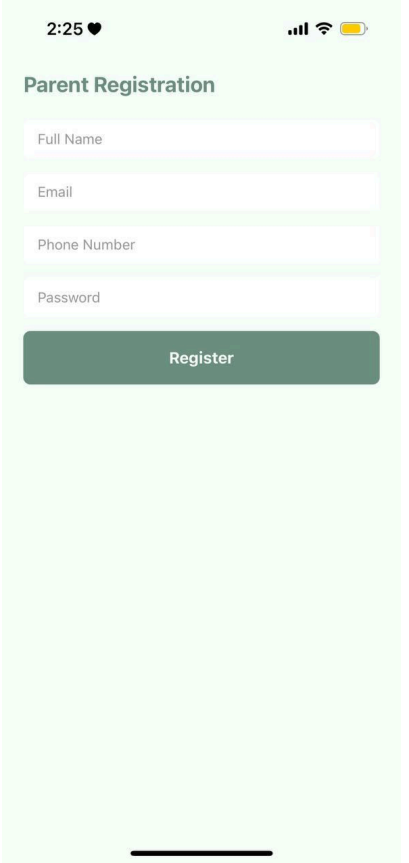
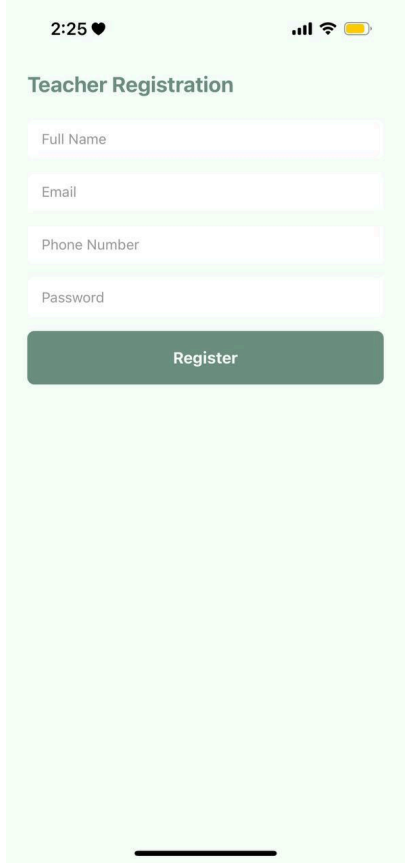
3.1.2 Login Page



The image shows a mobile application login page with a light green background. At the top, the status bar displays the time 2:19, a heart icon, and cellular, Wi-Fi, and battery status icons. The main heading "Welcome Back" is centered in a dark green font. Below it is an illustration of a person standing next to a door. The login form consists of two white input fields with light green borders, labeled "Enter your email" and "Enter your password". Below these fields is a link "Forgot Password?" in dark green. A large, dark green "Login" button is positioned below the link. At the bottom, there is a link "Don't have an account? Register Here" in dark green. A black horizontal line is visible at the very bottom of the screen.

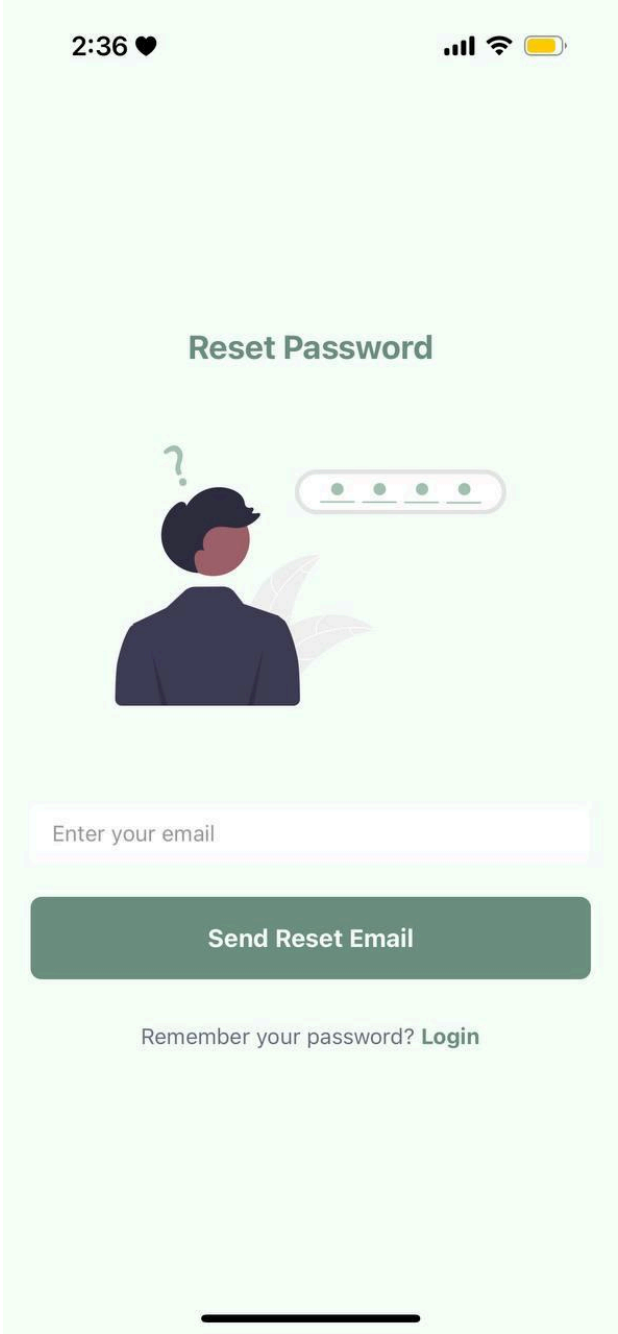
- The login page consists of an image with the “Welcome Back” header.
- There are fields “email” and “password” for the user to enter their details to login
- The button “Forgot Password?” sits below the login details for the user to navigate to the “Forgot Password Page”
- The “Login” button allows the users to verify their identity through firebase authentication to login onto our platform
- There is a “Register Here” button at the bottom for users who do not yet have an account yet to navigate to our “Registration Page”

3.1.3 Registration Page

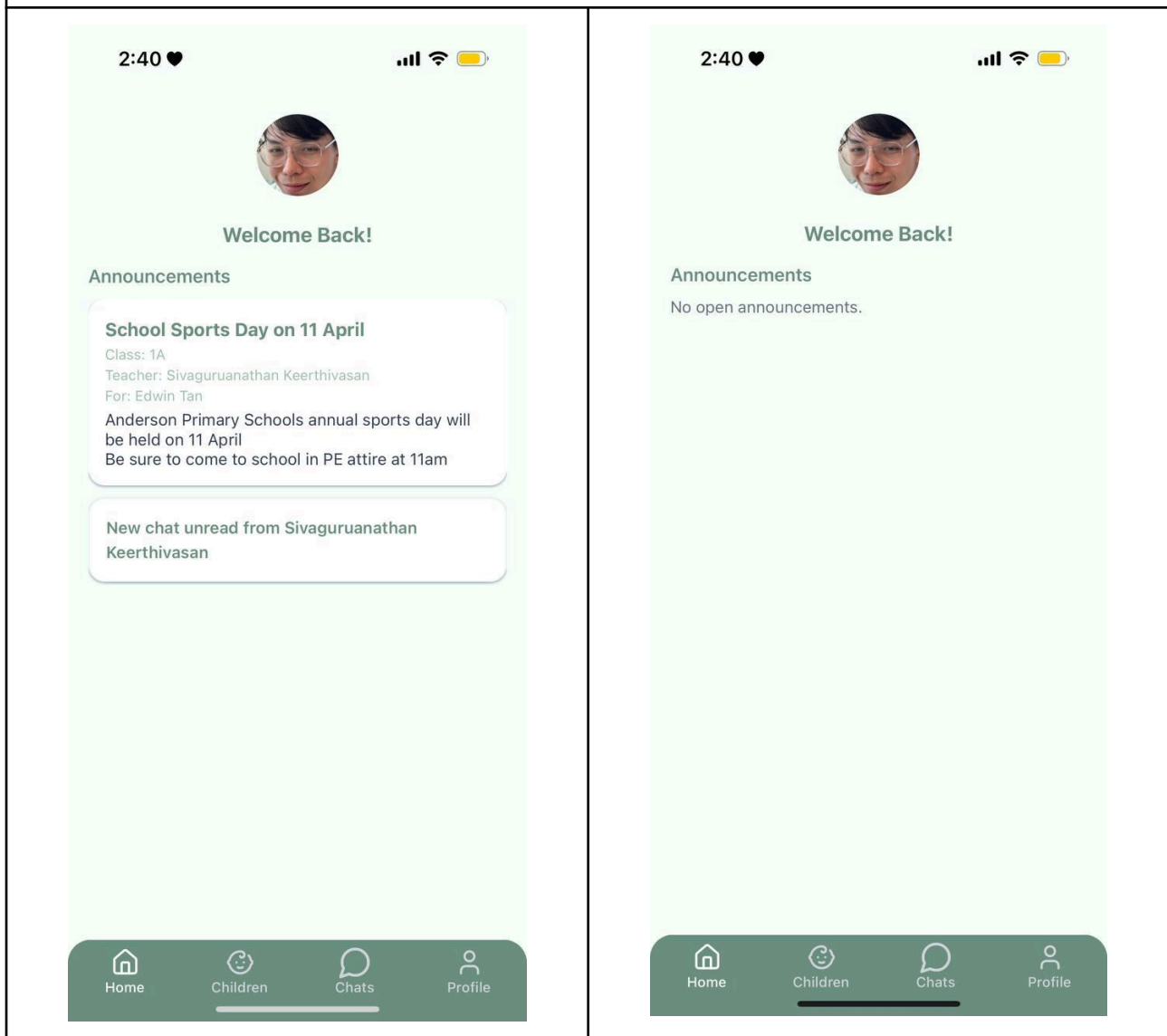
| 3.1.3 Registration Page | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>2:25 ♥ [signal] [wifi] [battery]</p> <p></p> <p>Tell me more about yourself... Are you a Parent or a Teacher?</p> <p>I'm a Parent!</p> <p>I'm a Teacher!</p> |  <p>2:25 ♥ [signal] [wifi] [battery]</p> <p>Parent Registration</p> <p>Full Name <input type="text"/></p> <p>Email <input type="text"/></p> <p>Phone Number <input type="text"/></p> <p>Password <input type="password"/></p> <p>Register</p> |  <p>2:25 ♥ [signal] [wifi] [battery]</p> <p>Teacher Registration</p> <p>Full Name <input type="text"/></p> <p>Email <input type="text"/></p> <p>Phone Number <input type="text"/></p> <p>Password <input type="password"/></p> <p>Register</p> |

- The registration page consists of 3 UI components
- The first UI component (On the far left) would be the main registration page whereby an image and short description about registration is shown
- 2 buttons are displayed “I’m a Parent!” and “I’m a Teacher!”
- Each of these buttons will take the user to the appropriate registration page
- Each registration page consists of the “Full Name”, “Email”, “Phone Number” and “Password” field to be filled in
- The user can then press the “Register” button to officially register
- While we do have a registration page on our platform, linking children and classes to the specific accounts requires the help of a database manager for security reasons
- We made the design choice of not using Gmail login or any other third party login system as we wanted teachers and parents to utilise their official Ministry of Education (MOE) accounts for security purposes as well

3.1.4 Forget Password Page

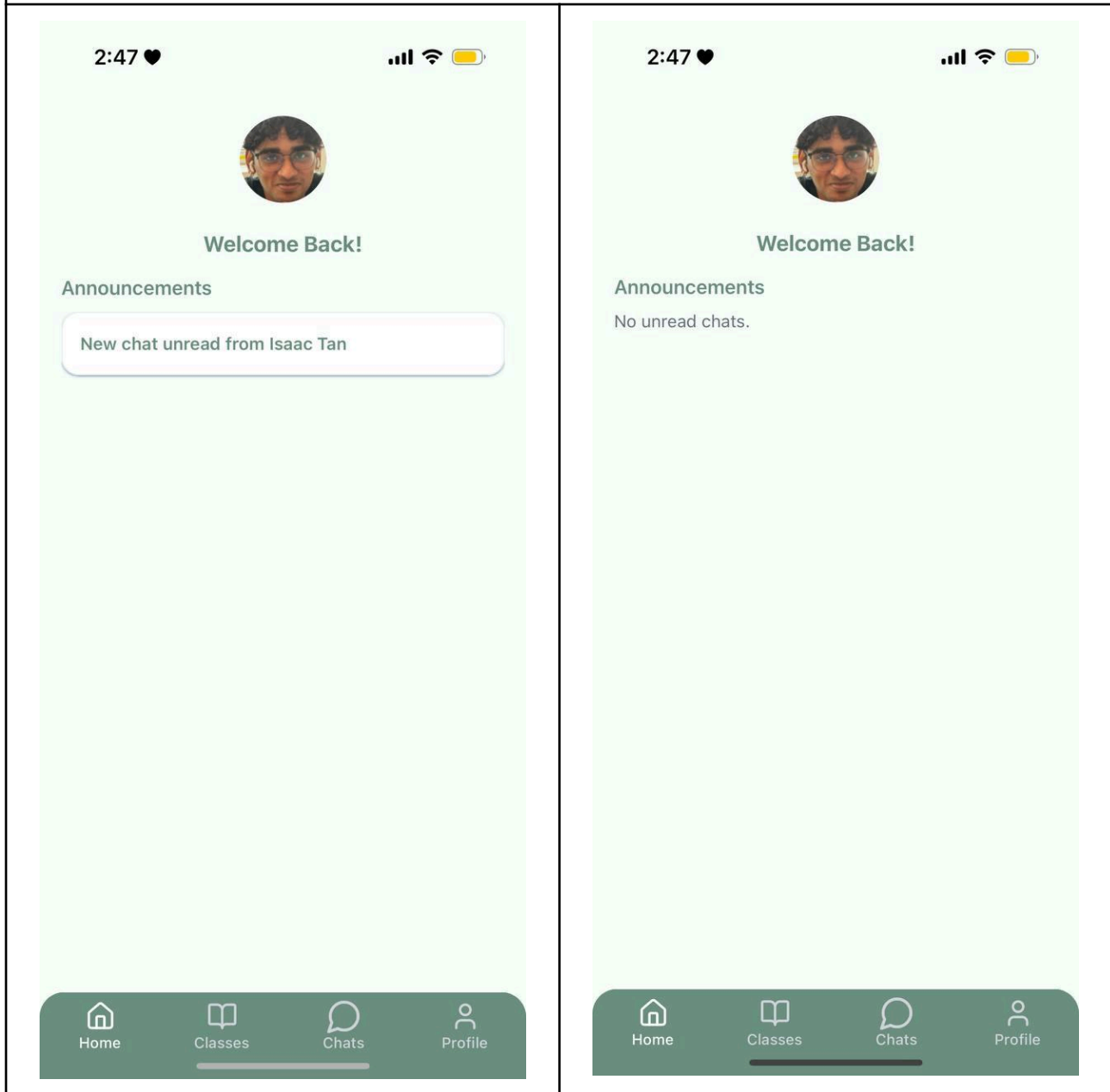
| | |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none">• The forget password page consists of an image with the header “Reset Password”• There is a field for users to enter their email• Pressing the “Send Reset Email” button will send a reset email to the users email account with instructions on how to reset their password for their account• The user will be navigated back to the login page• At the bottom there is also a “Login” button for users to be navigated back to the login page |
|------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

3.1.5.1 Home Page (Parent)



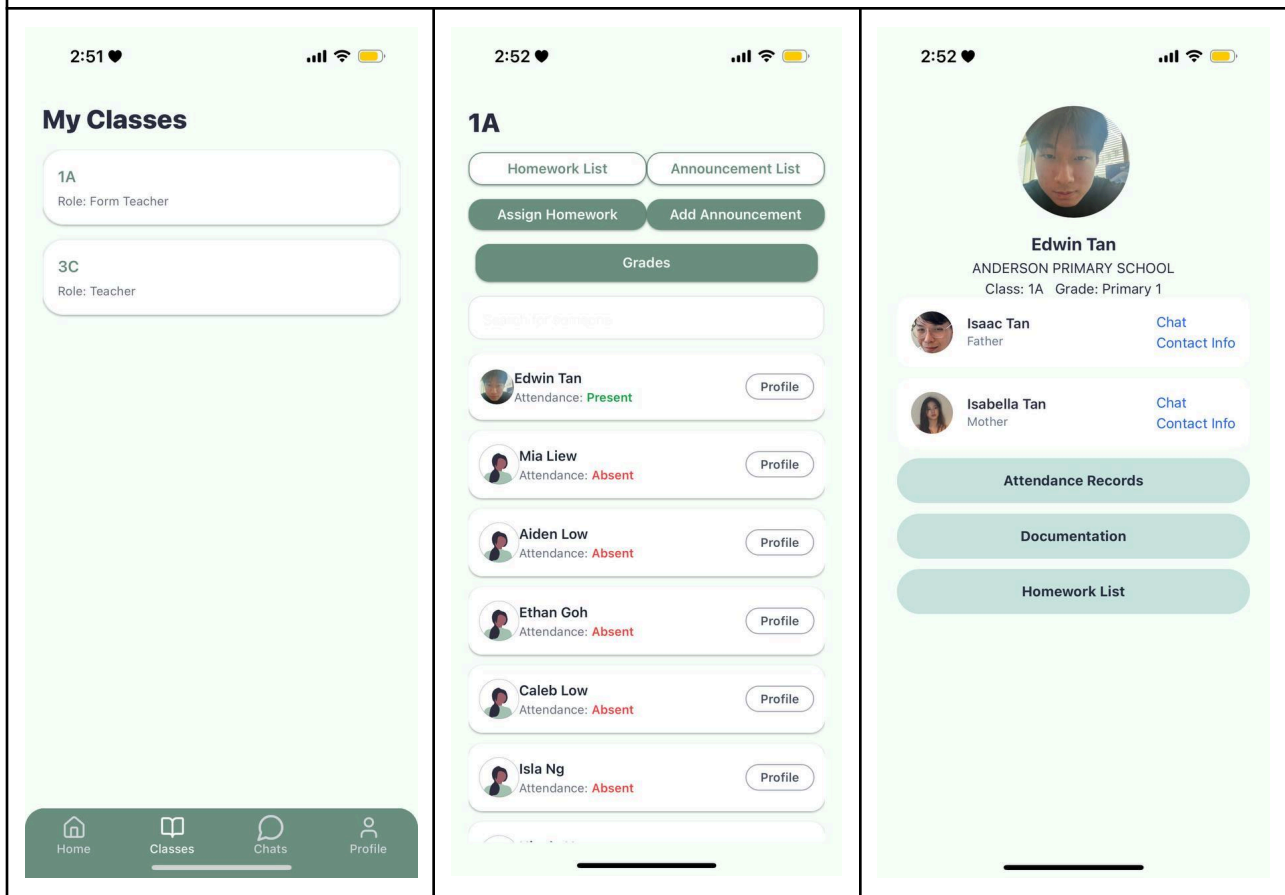
- The images above shows 2 different instances of the Parent's homepage
- The profile picture of the user as well as "Welcome Back" is displayed
- The navigation tab to navigate through the application is displayed
- A list of announcements (Given from the teacher) will be displayed
- Additional details such as the Class, Child and Teacher it is associated with is displayed as well
- New unread chats will also be displayed under the announcements tab
- Clicking on the new chat announcement directly opens the associated chat conversation
- "No open announcements" will be displayed if there are no announcements

3.1.5.2 Home Page (Teacher)



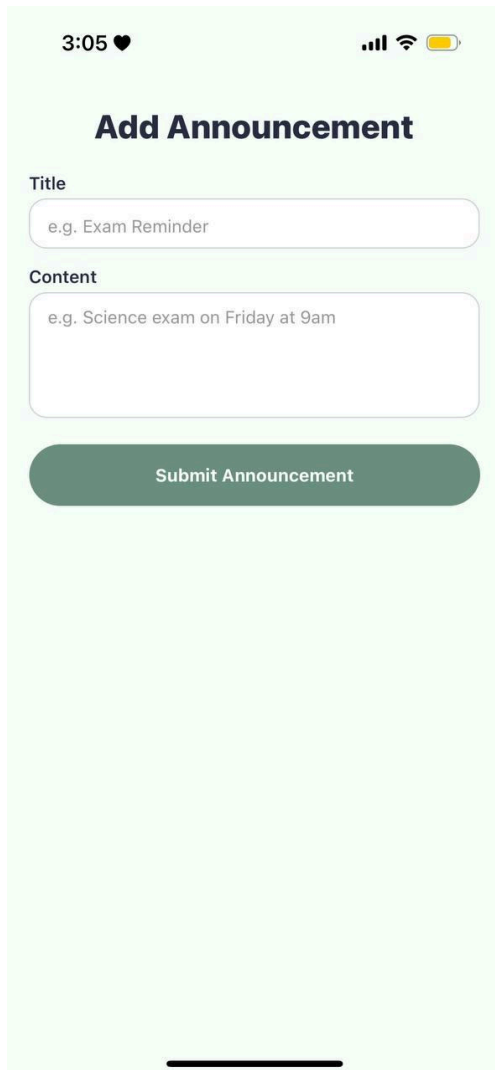
- The images above shows 2 different instances of the Parent's homepage
- The profile picture of the user as well as "Welcome Back" is displayed
- The navigation tab to navigate through the application is displayed
- A list of announcements will be displayed
- New unread chats will also be displayed under the announcements tab
- Clicking on the new chat announcement directly opens the associated chat conversation
- "No open announcements" will be displayed if there are no announcements

3.1.6 Classes



- Pressing on the classes button when logged in as a teacher account will navigate to a list of classes that the teacher is currently managing
- The role “Form Teacher” or “Teacher” and the respective class name will be displayed depending whether the teacher is a Form Teacher or normal Teacher
- Pressing any of the classes will bring the user to the manage class page whereby a multiple tools are available at the teacher’s disposal
- “Homework List”, “Assign Homework”, “Announcement List”, “Add Announcement” and “Grades” buttons are available for the teacher to manage the class
- A list of students in the class are displayed together with their profile picture and attendance for the day
- A search bar is available for the teacher to quickly find a specific student
- Pressing on any of the children will quickly toggle today’s attendance of the student between “Present” and “Absent”
- Pressing the “Profile” button for each student leads the user to the profile page of the student whereby additional details such as “School”, “Class” and “Grade” are available
- Quick buttons to “Chat” and view the “Contact Info” of the student’s parents are available
- “Attendance Records”, “Documentation” and “Homework List” are also available on this individual child profile page

3.1.6.1 Announcements (Teacher)



3:05 ♥

Add Announcement

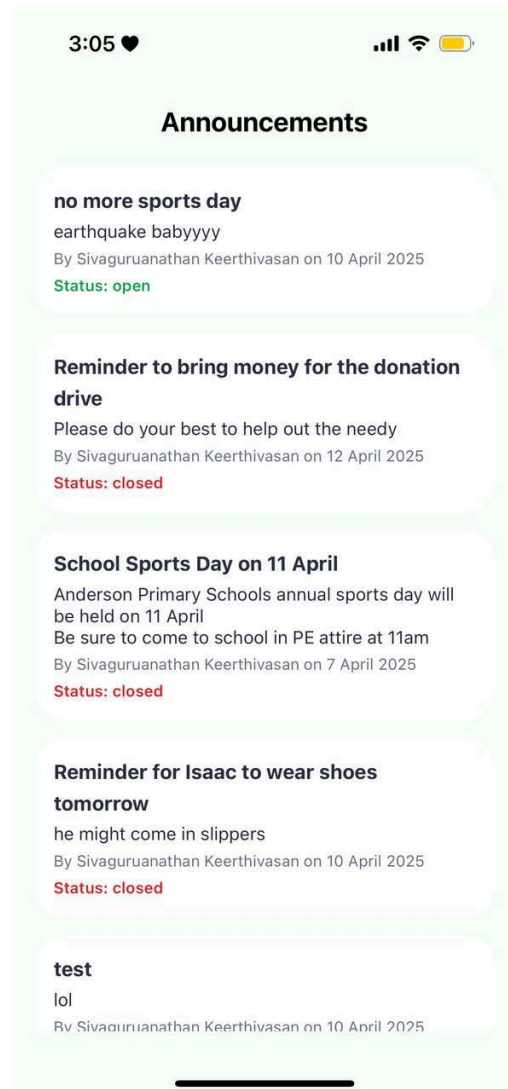
Title

e.g. Exam Reminder

Content

e.g. Science exam on Friday at 9am

Submit Announcement



3:05 ♥

Announcements

no more sports day
earthquake babyyyy
By Sivaguruanathan Keerthivasan on 10 April 2025
Status: open

Reminder to bring money for the donation drive
Please do your best to help out the needy
By Sivaguruanathan Keerthivasan on 12 April 2025
Status: closed

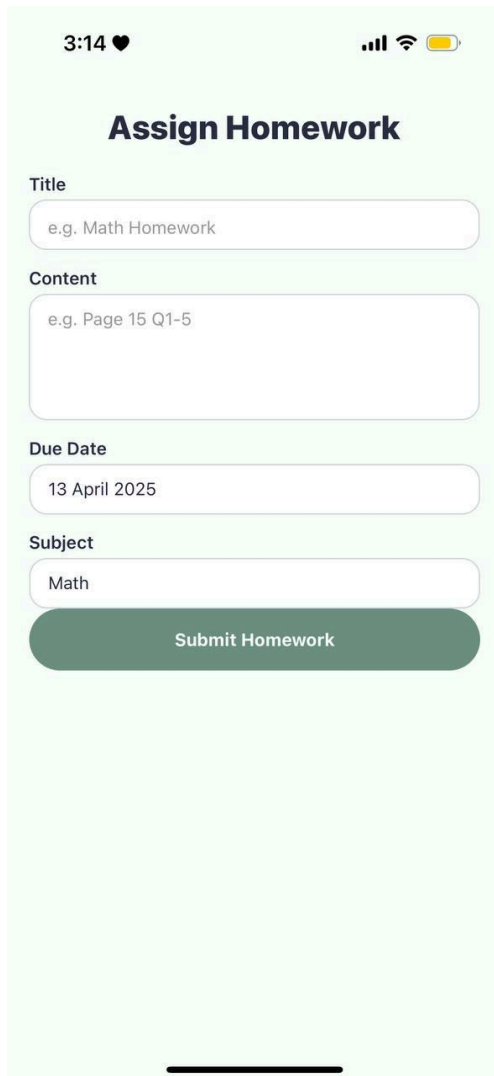
School Sports Day on 11 April
Anderson Primary Schools annual sports day will be held on 11 April
Be sure to come to school in PE attire at 11am
By Sivaguruanathan Keerthivasan on 7 April 2025
Status: closed

Reminder for Isaac to wear shoes tomorrow
he might come in slippers
By Sivaguruanathan Keerthivasan on 10 April 2025
Status: closed

test
lol
By Sivaguruanathan Keerthivasan on 10 April 2025

- Clicking on the announcement list button from within a specific class leads directly to the list of announcements for the entire class with information such as the title, content, teacher who created it, the time it was created and status being displayed
- The user may press any of the announcements to toggle its status
- An announcement with the status “open” will appear on the respective parent’s announcements while an announcement with the status “closed” will not
- Pressing the add announcement button from within a specific class leads to a “Add Announcement” form whereby the fields “Title” and “Content” are available for the teacher user to enter information into
- The “Submit Announcement” button officially adds the announcement to the server and announcement list

3.1.6.2 Homework (Teacher)



3:14 ♥

Assign Homework

Title

e.g. Math Homework

Content

e.g. Page 15 Q1-5

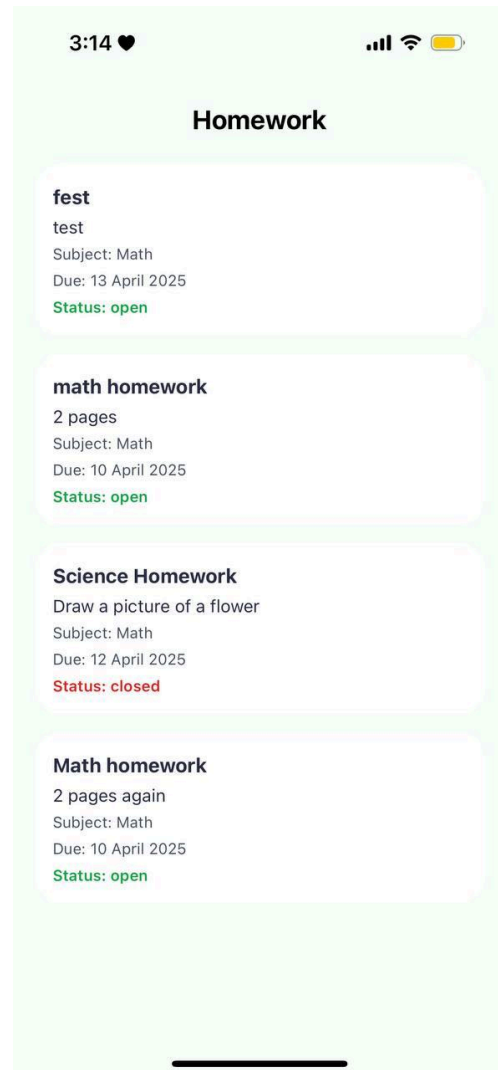
Due Date

13 April 2025

Subject

Math

Submit Homework



3:14 ♥

Homework

fest
test
Subject: Math
Due: 13 April 2025
Status: open

math homework
2 pages
Subject: Math
Due: 10 April 2025
Status: open

Science Homework
Draw a picture of a flower
Subject: Math
Due: 12 April 2025
Status: closed

Math homework
2 pages again
Subject: Math
Due: 10 April 2025
Status: open

- Clicking on the home list button from within a specific class leads directly to the list of announcements for the entire class with information such as the title, content, subject, due date and status is displayed
- The user may press any of the homework to toggle its status
- An homework with the status “open” will appear on the respective child’s homework list while a homework with the status “closed” will not
- Pressing the add homework button from within a specific class leads to a “Add Homework” form whereby the fields “Title”, “Content”, “Due date” and “Subject” are available for the teacher user to enter information into
- The “Submit Homework” button officially adds the homework to the server and homework list

3.1.6.3 Documentation (Teacher)

3:19 ♥

📶 🔋

Add Documentation

Title

Content

Upload Image

Upload PDF

Submit

3:19 ♥

📶 🔋

Documentation List


Monkey prank

document without a monkey


Created by: Isaac Tan, Parent

13 Apr 2025

THIS IS A VERY IMPORTANT DOCUMENT THAT NEEDS TO BE SENT



Open in Browser




Add Documentation

- Clicking on the documentation button from within a specific student profile leads directly to the documentation list
- The documentation list will display a list of documents that including the “Title”, “Content”, Name of the user who created it, Date it was created and any PDF or Images where applicable
- There is a “Add Documentation” button at the bottom whereby the user will be lead to a “Add Documentation” form whereby the fields “Title” and “Content” are available for the user to enter information into
- There are also “Upload Images” and “Upload PDF” buttons to open the image gallery and file explorer to optionally upload a image or PDF respectively
- The “Submit” button officially adds the document to the server and child’s documentation list

3.1.6.4 Attendance (Teacher)

3:33




Edwin Tan
ANDERSON PRIMARY SCHOOL
Class: 1A Grade: Primary 1

< April 2025 >


| | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| 30 | 31 | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 1 | 2 | 3 |

3:33

Attendance 10/04/2025



Edwin Tan
Class: 1A Grade: Primary 1



Present


Upload Photo

Mark Present


Mark Absent

3:33

Attendance 07/04/2025



Edwin Tan
Class: 1A Grade: Primary 1



Absent

Upload Photo

Mark Present

Mark Absent

3:34

Attendance 11/04/2025

No data recorded for this day
Contact a teacher if you believe this is an error.

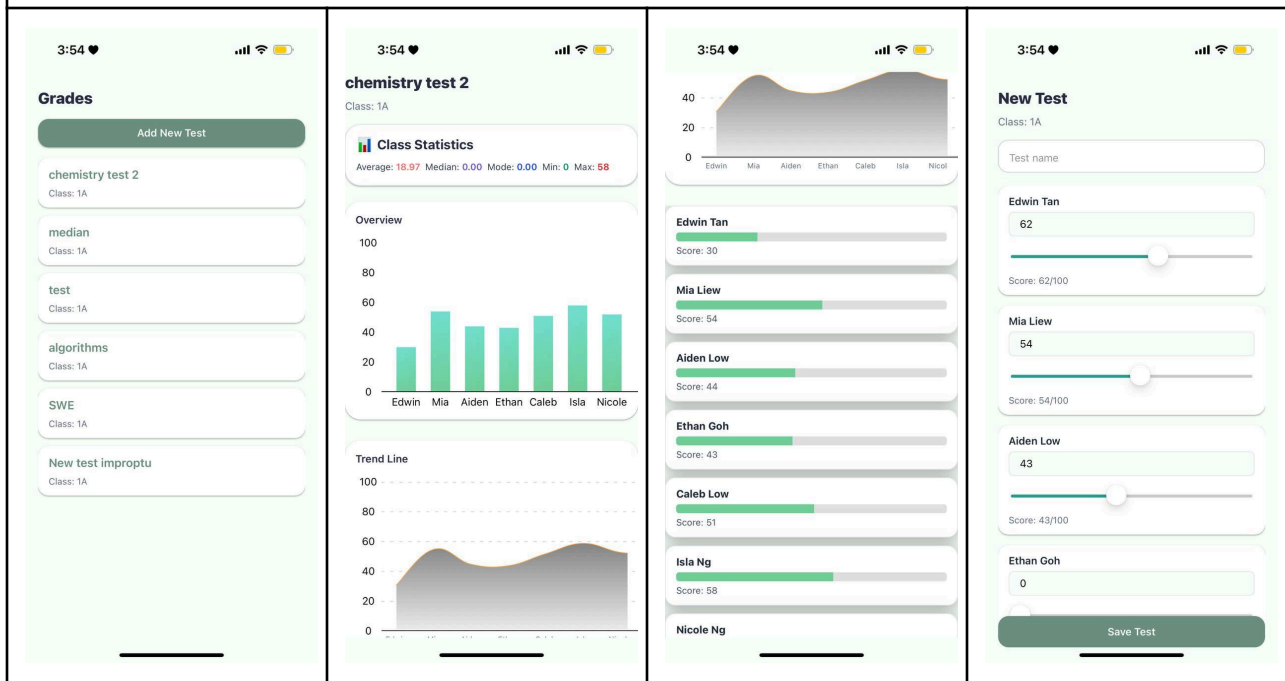
Upload Photo

Mark Present

Mark Absent

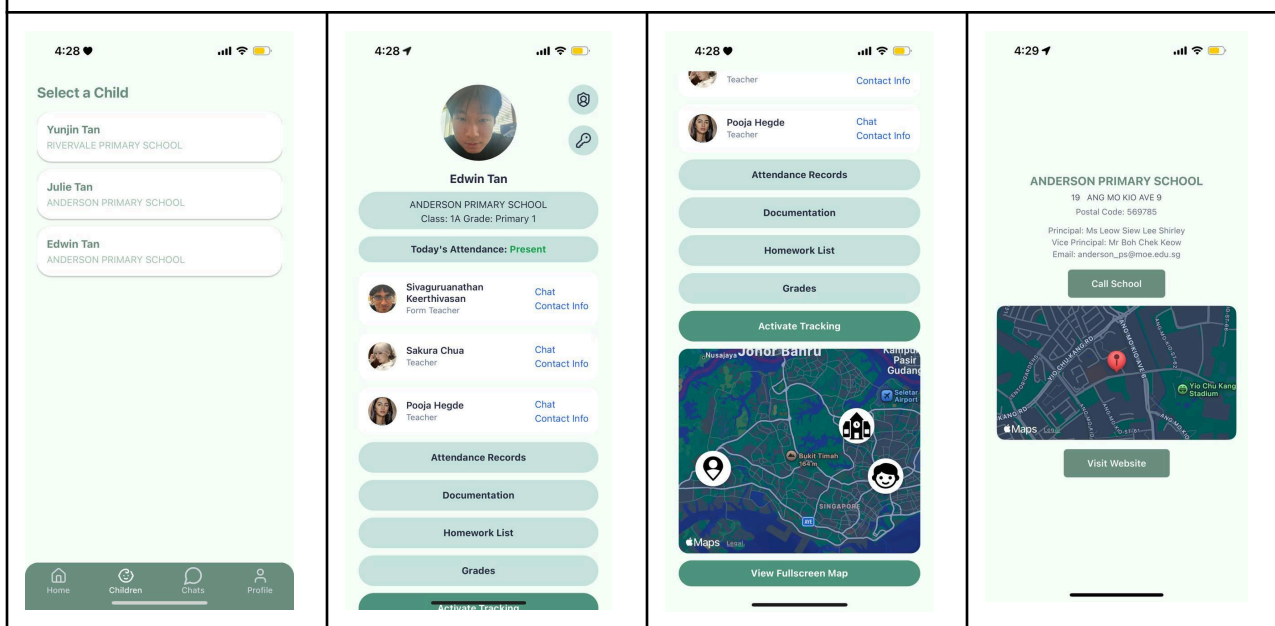
- Clicking on the attendance record button from within a specific student profile leads directly to the attendance record list in calendar view
- Green circles indicate a day where the student was present, Red circles indicate a day where the student was absent and no circle represents a day where no data was available (Public holiday for example)
- The three UI screens show the different attendance record displays when clicking on a specific day
- 3 buttons will be present within each individual day "Upload Photo" which opens the user's gallery to upload a photo, "Mark Present" which changes the attendance status to present and "Mark Absent" which changes the attendance status to absent

3.1.6.5 Grades (Teacher)



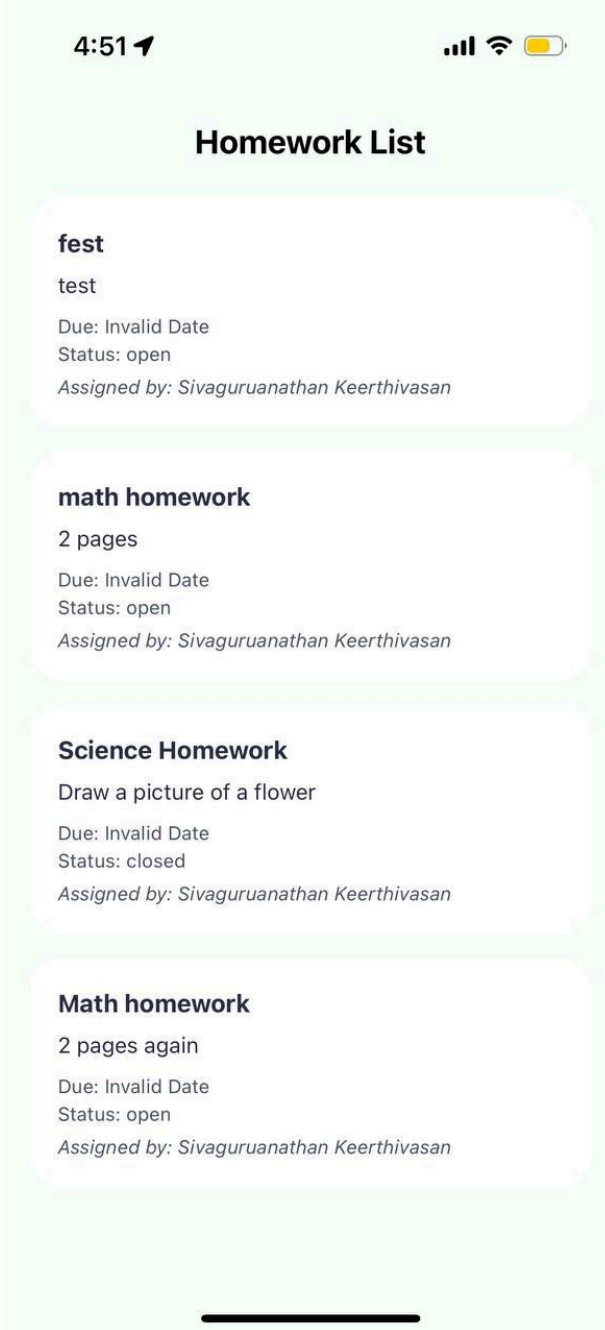
- Clicking on the grades button from within a specific class leads directly to the list of test that the entire class has taken with information such as the name of the test and class being displayed
- Clicking on each of the individual test leads to a test results page whereby the the “Class Statistics” such as Average, Median, Mode, Min and Max are shown together with a bar graph and line distribution graph of the class’s scores
- These statistics allows the teacher to view the class performance for a specific test at a glance
- Scrolling down on this page leads to the individual scores for every student in the class
- There is also a “Add New Test” button at the top whereby the user will be able to click it to enter the “Test Creation Form” whereby the fields “Test name” together with a list of students is present to the user to fill in the individual test scores for each student using either the slider or by manually typing in the numeric score
- The “Save Test” button officially adds the test to the server and class’s test list

3.1.7 Children



- Pressing on the children button when logged in as a parent account will navigate to a list of children for that parent
- The name of the child and the respective school name will be displayed
- Pressing any of the children will bring the user to the individual student profile where there are multiple tools at the parent's disposal
- The child's image is displayed at the top together with the child's school, class, grade and today's attendance
- "Chat" and "Contact Info" buttons for every one of the child's teachers are available for the parent to create a chat conversation with and see the chat information of the teacher respectively
- Additionally, there are two icons at the top for "Child Mode" and "Change Child Pin" respectively. Refer to 3.1.7.6 for more information
- Other buttons such as "Attendance Records", "Documentation", "Homework List" and "Grades" are available for the parent to interact with
- There is also a "Activate Tracking" button when scrolling down together with a map and a "View Fullscreen Map" button
- Pressing on the "Activate Tracking" button begins tracking the child. Refer to 3.1.7.6 for more information
- Pressing the "View Fullscreen Map" button directly opens the map into a full screen view
- Pressing on the school information at the top beneath the child's profile picture navigates to a page whereby basic school information such as name, address, postal code, principles and email is **polled from the Data.Gov MOE API** and is displayed
- A map displaying the location of the school is also displayed
- There are two buttons "Visit Website" and "Call School" that the parent can interact with and press to either open the phone app to call school or visit the schools website on the phone's native internet explorer

3.1.7.1 Homework (Parent)

| | |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <ul style="list-style-type: none">• The homework list page can be navigated by the parent from the individual child's profile• It displays a list of homework that was assigned to the child including information such as title, content, due date, status and the name of the person who assigned the homework |
|------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

3.1.7.2 Documentation (Parent)

3:19 ♥

📶 🔋

Add Documentation

Title

Content

Upload Image

Upload PDF

Submit

3:19 ♥

📶 🔋

Documentation List


Monkey prank

document without a monkey


Created by: Isaac Tan, Parent

13 Apr 2025

THIS IS A VERY IMPORTANT DOCUMENT THAT NEEDS TO BE SENT



Open in Browser




Add Documentation

- Clicking on the documentation button from within a specific child profile leads directly to the documentation list
- The documentation list will display a list of documents that including the “Title”, “Content”, Name of the user who created it, Date it was created and any PDF or Images where applicable
- There is a “Add Documentation” button at the bottom whereby the user will be lead to a “Add Documentation” form whereby the fields “Title” and “Content” are available for the user to enter information into
- There are also “Upload Images” and “Upload PDF” buttons to open the image gallery and file explorer to optionally upload a image or PDF respectively
- The “Submit” button officially adds the document to the server and child’s documentation list

3.1.7.3 Attendance (Parent)

4:56




Edwin Tan
ANDERSON PRIMARY SCHOOL
Class: 1A Grade: Primary 1

April 2025


| | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|
| Sun | Mon | Tue | Wed | Thu | Fri | Sat |
| 30 | 31 | 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 |
| 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | 29 | 30 | 1 | 2 | 3 |

4:57

Attendance 10/04/2025




Edwin Tan
Class: 1A Grade: Primary 1




Present

4:57

Attendance 07/04/2025



Edwin Tan
Class: 1A Grade: Primary 1



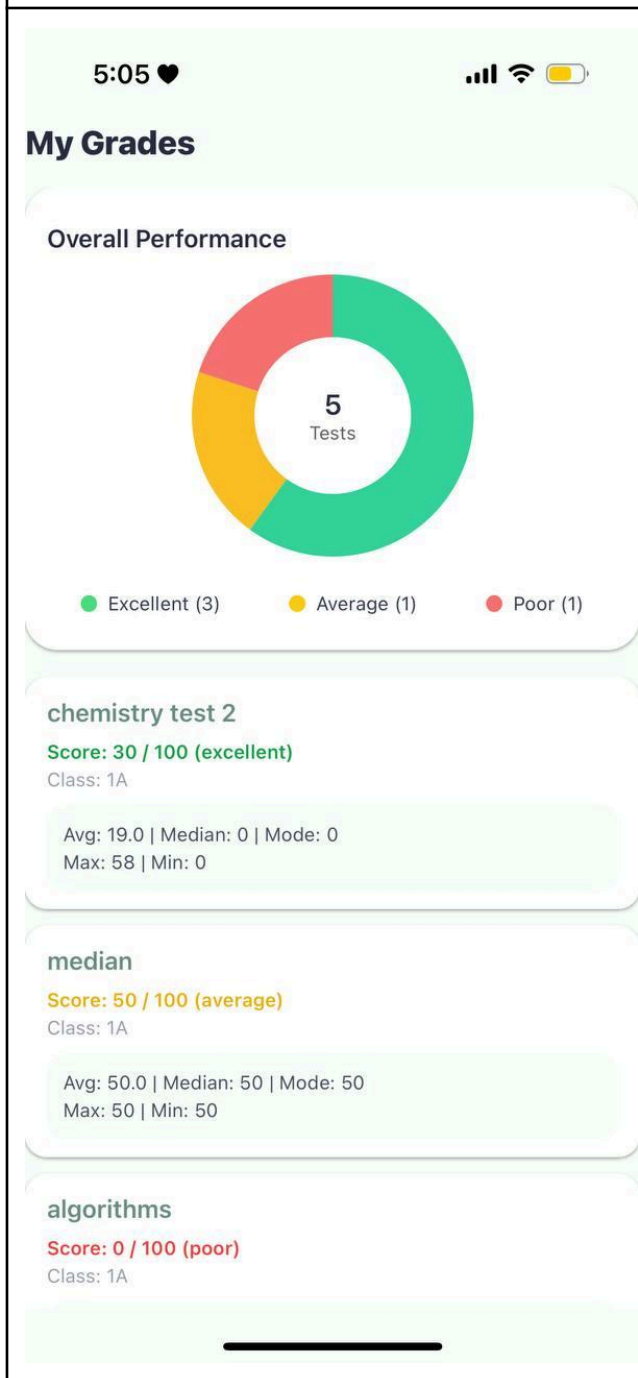
Absent

4:57

Attendance 11/04/2025

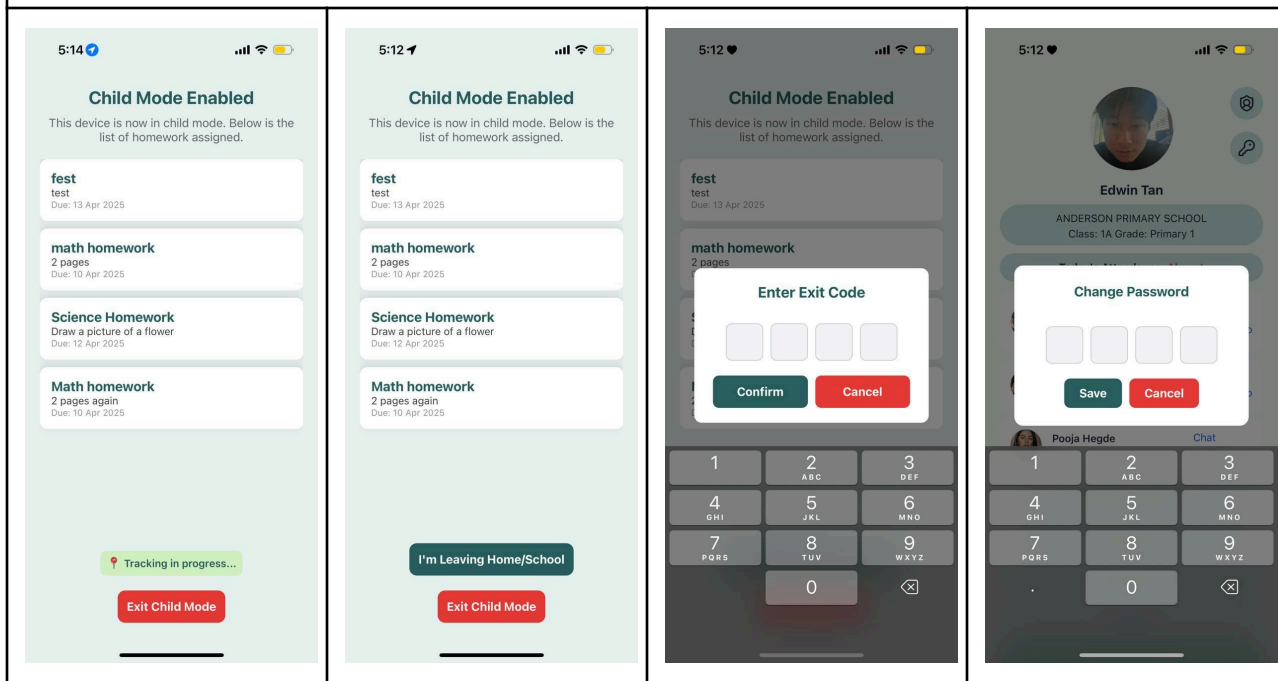
No data recorded for this day
Contact a teacher if you believe this is an error.

3.1.7.4 Grades (Parent)



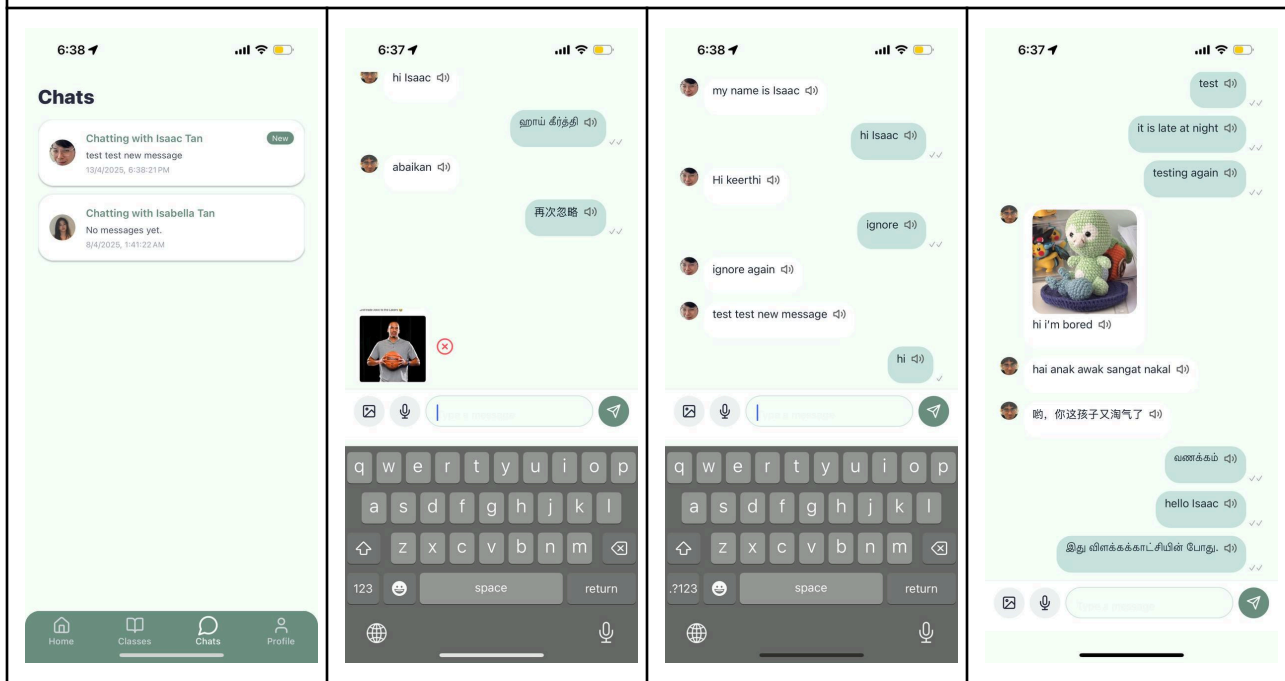
- The individual grades page can be navigated by the parent from the individual child's profile
- It displays the child's overall performance in a pie chart
- The pie chart consists of between 1-3 categories
- Green indicates a test where the child has done well relative to the other students taking the same test
- Yellow indicates a test where the child has done average relative to the other students taking the same test
- Red indicates a test where the child has done poorly relative to the other students taking the same test
- The pie chart provides a quick overview for the parent to see how the child is performing at a glance
- The user will also be able to scroll down to view statistics for each individual test
- Information such as title, (individual) score, class, average, median, mode, max and min are displayed for each test

3.1.7.5 Child Mode (Parent)



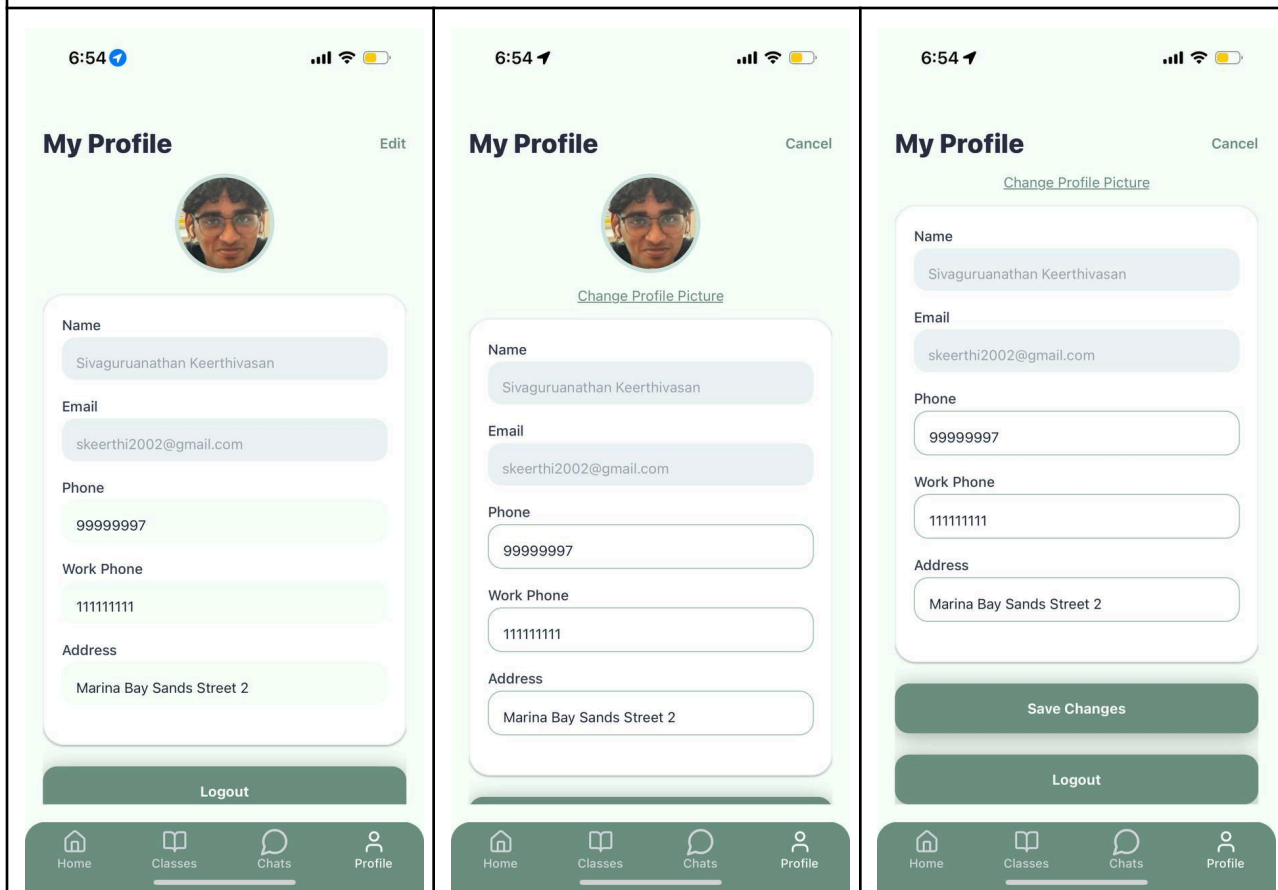
- Pressing the child mode icon from the individual child's profile enables child mode to become active
- While in child mode, the child would not be able to exit child mode unless the correct child pin is entered
- The exit code/child pin will be prompted to be submitted whenever the "Exit Child Mode" button is pressed
- The child pin will comprise of 4 digits for the user to key in
- A list of homeworks that have the status = "open" is displayed for the child to view, including information such as name, content and the due date of the homework
- There is a "I'm Leaving Home/School" button so that the child is able to enable tracking whenever he commutes
- The key symbol button prompts the parent to have the ability to change the password whenever needed
- The child's location will be tracked **LIVE** and be viewable from the parent's side under the individual child's map in their profile

3.1.8 Chat



- Pressing on the chat button when logged in navigates the user to a list of chats that he or she is involved in
- The name of the person you are chatting with as well as the last message's date and timestamp is recorded and displayed for each chat
- If there is a new message and the chat is still unopened, the "New" tag will appear
- Pressing into the chat opens the full chat conversation
- The chat will be auto scrolled to the bottom upon entry
- A picture icon will be displayed for the user to upload images to the chat
- A speaker icon will be displayed for the user to voice record their conversation and **translate it into text**
- A field is provided for the user to type their message as well as a button to send their message
- For each chat message there will be two ticks to indicate that a chat has been read by the other user and one tick to indicate that a chat has not yet been read by the other user
- Each of the chat is able to be translated into the four national languages of Singapore (English, Chinese, Malay, Tamil) by pressing on the chat message itself
- There is a audio button next to each message so that the message can be read out loud to the user in the language that it is in
- A small profile picture of the person you and messaging is also displayed next to each chat bubble

3.1.9 Profile



- Pressing on the profile button when logged in navigate the user to his or her own profile
- The profile tab displays information including name, email, phone, work phone and address
- The profile picture of the user is also displayed
- There is a “Logout” button displayed at the bottom for the current user to log out of the application
- There is a “Edit button which makes the phone, work phone and address fields editable for the user to change
- There is a “Change Profile Picture” button that appears when the “Edit” button is pressed which opens the user’s mobile gallery
- There is a “Save Changes” button that appears when the “Edit” button is pressed to enable the changes to be officially updated in the server and the user’s profile page
- There is a “Cancel” button that appears when the “Edit” button is pressed to cancel the changes when necessary

3.2 Hardware Interfaces

ChildConnect directly interfaces with the various hardware devices on IOS and Android devices since it is a mobile application. These interactions are done using the React-Native and Expo SDK modules. Using these modules allows us to access the hardware interfaces cross-platform. Devices must support internet connectivity, camera, microphone, GPS, and file storage. Minimum IOS 13.0 or later and Android 8.0 (API level 26) or later is required

| Hardware Component | Purpose | Interface |
|------------------------|--------------------------------------------------------------------------|---------------------------------------------------|
| Camera | Capture profile images, documentation, and attendance photos | expo-image-picker |
| Microphone | Record audio for voice messaging or speech-to-text functionality | expo-av, expo-media-library |
| GPS / Location | Location-based features (e.g. tracking school commute, tagging events) | expo-location |
| File System | Access and temporarily store images, documents, and audio files | expo-file-system |
| Display | User interface rendered responsively across various screen sizes | react-native-safe-area-context |
| Touch / Gesture Sensor | Swipe, tap, slider, and long press for interactive elements | react-native-gesture-handler, react-native-slider |
| Network Interface | Internet access for API communication, database interaction, and uploads | Mobile or Wi-Fi connectivity; required at runtime |

3.3 Software Interfaces

| Software Component | Purpose |
|--------------------|----------------------------------------------------------|
| FastAPI (Python) | REST API backend service and business logic |
| Firebase Admin SDK | Backend-side user management and secure Firestore access |

| | |
|---------------------------------------------------|----------------------------------------------------------|
| Firebase Authentication | User identity management (email/password login) |
| Cloudinary API | Upload and store user media assets. |
| Google Cloud Translation API | Translate messages across Singapore's national languages |
| Google Cloud Speech-to-Text API | Transcribe voice messages to text |
| Google Cloud Text-to-Speech API | Convert text messages into audio playback |
| Data.gov MOE School Directory and Information API | Extract latest school information |

3.4 Communications Interfaces

HTTPS (TLS 1.2+) for all communication to:

- Firebase Authentication and Firestore
- FastAPI backend endpoints
- Google Cloud APIs
- Cloudinary file uploads
- Data.gov MOE School Directory and Information API

All messages between frontend and backend follow RESTful conventions using:

- HTTP methods: GET, POST, PUT, DELETE, PATCH
- Request/response format: JSON
- File uploads: Base64-encoded payloads (for media) or multipart/form-data when needed
- Authentication and session validation: OAuth2 / Firebase Token:

4. System Features

4.1 Welcome Page

4.1.1 Description and Priority

The Welcome Page of the Child Connect application is a critical entry point that introduces users to the app in a clean, simple, and accessible manner. As the first screen users see, it sets the tone for the overall user experience. It primarily showcases the app's name and a “Get Started” button to initiate navigation.

4.1.2 Stimulus/ Response Sequences

- When the application is first launched, the welcome page must immediately appear
- When the user clicks the “Get Started” button, they are navigated to the “Log In” page.

4.1.3 Functional Requirements

4.1.3.1 The application will be in the English language

4.1.3.2 When the User clicks on the application, they will be guided to the landing page if they are not signed in

4.1.3.3 The application must check whether or not the User has provided it with Global Positioning System (GPS) permission

4.1.3.3.1 If the GPS permission is not provided, User will be prompted to give the app permission to use GPS

4.1.3.3.2 If GPS permission is denied, features that require location access (e.g., child tracking) will be disabled.

4.1.3.3.2.1 If the user refuses to accept GPS permission, the app will prompt the user with a message urging them to give access.

4.1.3.3.2.2 If the user still refuses, the app will continue to work without location features.

4.2 Login Page

4.2.1 Description and Priority

The Login Page is a core component of the Child Connect application, allowing registered users such as teachers and parents to securely access their accounts. It contains fields for email and password, and includes essential security features such as password masking. As it acts as a gateway to all application functionalities, it is assigned a high development priority to ensure both security and ease of use.

4.2.2 Stimulus/ Response Sequences

- When the user enters their registered email address and password and clicks the “Login” button, the system navigates the user to the Homepage based on their user role
- When the user clicks the “Forgot Password” button, the system redirects them to a secure page where they can reset their password
- When the user clicks the “Register” button, the system navigates them to the account registration page

4.2.3 Functional Requirements

4.2.3.1 Users with an existing account must be able to login into the application with their respective email address

4.2.3.1.1 The input box will be identified by words prompting the user to input their registered email address

4.2.3.1.2 The user must click on the text box

- 4.2.3.1.3 If the system is unable to verify the correctness of the email address, it will print an error message “Invalid Email”
- 4.2.3.2 Users with an existing account must type in the password created when registering for the account
- 4.2.3.2.1 The input box will be identified by words prompting the user to input the password that they created
- 4.2.3.2.2 The password entered by the user must be masked during input to ensure that it is not visible on the screen
- 4.2.3.2.3 The user must click on the text box
- 4.2.3.2.4 If the system is unable to verify the correctness of the password, it will print an error message “Wrong Password”
- 4.2.3.3 If the both the email address field and password field can be ascertained, the user will be navigated to Home page
- 4.2.3.4 The system must also display a “Forgot Password” field to allow User to retrieve their respective account login information
- 4.2.3.5 Users must have the option to navigate to the registration page if they do not have an account

4.3 Registration Page

4.3.1 Description and priority

The Registration Page is a critical component of the Child Connect application, allowing new parent users or teacher users to create an account. The page collects essential user information such as name, email address, and password. For teacher users, registration must be done using a valid Ministry of Education (MOE) email address to ensure authenticity. Given that registration is required to access any application functionality, this page has a high development priority.

4.3.2 Stimulus/Response Sequence

- The user will be first prompted to select their role - either Teacher or Parent - before being redirected to their specific registration form.
- When the “Register” button is clicked and the registration is successful, the system displays a “success” message to confirm the account creation. They are then guided to the Login page.
- When the “Register” button is clicked and there are any input that is invalid or incomplete, the system displays relevant error message and the user will still be in the same page
- For users who already have an account, they can click the “Login” button to be redirected back to the Login page.

4.3.3 Functional Requirement

4.3.3.1 Users will select between 2 distinct buttons labelled “Parent” or “Teacher” at the beginning of the registration process

4.3.3.1.1 Regardless of the role selected, the same input fields such as name, email, phone number, password must be presented

4.3.3.1.2 The role selected will determine the applicable validation logic for the user

4.3.3.2 The user must key in their full name

4.3.3.2.1 The full name input field must display placeholder text such as "Full name"

4.3.3.2.2 The field must accept only alphabetic characters and spaces

4.3.3.2.3 If the name format is invalid, the system must display: "Invalid name format"

4.3.3.2.4 If the field is left blank, the system must display an error message "Missing Fields"

4.3.3.3 The user must key in their email address

4.3.3.3.1 The email field must display a placeholder text such as "Email"

4.3.3.3.2 If the user is a teacher, the field must validate that it is a moe email (e.g. name@moe.gov.sg)

4.3.3.3.3 If the user is a parent, the field must validate that it is a valid email format (e.g. name@example.com)

4.3.3.3.4 If the email format is invalid, the system must display: "Invalid email format"

4.3.3.3.5 If the field is left blank, the system must display an error message "Missing Fields"

4.3.3.4 The user must key in their phone number

4.3.3.4.1 The phone number field must display placeholder text such as "Enter your phone number"

4.3.3.4.2 The field must accept only numeric values and have a minimum of 8 digits

4.3.3.4.3 If the input is invalid or incomplete, the system must display: "Invalid phone number"

4.3.3.4.4 If the field is left blank, the system must display an error message "Missing Fields"

4.3.3.5 The user must create a password

4.3.3.5.1 The password field must display placeholder text such as "Create a password".

4.3.3.5.2 The input must be masked so the characters are not visible during entry.

4.3.3.5.3 The password must contain at least 8 characters, including both letters and numbers.

4.3.3.5.4 If the password does not meet the criteria, the system must display: "Password must be at least 8 characters and include both letters and numbers".

4.3.3.6 The user must be able to submit the form by clicking the "Register button"

4.3.3.6.1 The system must validate all the fields

4.3.3.6.2 If all the fields are valid, a success must be shown and the user must be redirected to the Login page

4.3.3.6.3 If any fields are invalid, the system must show the relevant error message and they will remain on the same page.

4.3.3.7 The registration page must include a clearly visible "Login" button for user who already have an existing account

4.4 Forgot Password Page

4.4.1 Description and priority

The Forgot Password Page allows users who are unable to recall their login credentials to securely reset their password. This page is essential for account recovery and maintaining continued access to the platform. It contributes significantly to user experience and account security. Given its role in user retention and data protection, this page has a high development priority.

4.4.2 Stimulus/Response Sequence

- When the user clicks the “Forgot Password” link on the Login Page, the system displays the Forgot Password Page
- The user enters their registered email address into the input field and clicks the “Send Reset Email” button
- If the email is valid and associated with an account, the system sends a password reset email containing a secure link to reset the password

4.4.3 Functional Requirement

4.4.3.1 The user must be able to enter their registered email address

4.4.3.1.1 The input box must display “Enter your email address” to guide the user

4.4.3.1.2 The input box must be provided for the user to enter the email address used during the registration

4.4.3.1.3 Users must click on the textbox to enter text

4.4.3.2 User will then click the send button to send a password reset link to their email

4.4.3.2.1 If the email entered is not valid, the input box will be highlighted red

4.4.3.2.2 If the email entered is not valid, an error message 'Invalid Email' will be shown.

4.4.3.3 Users must be provided with the option to navigate back to the sign in page

4.4.3.3.1 They can do this by clicking on the “Sign In” button

4.5 Parent Home Page

4.5.1 Description and priority

The Parent Home Page serves as the main dashboard for parent users upon successful login. It provides access to key features such as viewing their announcements and notifications of chats from teachers. The layout must be intuitive and personalised to support quick access to relevant information. As it is the central hub for parental engagement, this page has a high development priority.

4.5.2 Stimulus/Response Sequence

- When the parent clicks on a chat notification, the system must navigate them directly to the specific chat conversation that triggered the notification.
- When the parent clicks the “Children” button, the application must navigate them to the Children Page
- When the parent clicks the “Chat” button, the application must navigate them to the Chat Page
- When the parent clicks the “Profile” button, the application must navigate them to the Profile Page

4.5.3 Functional Requirement

4.5.3.1 The Parent Home Page must display navigation buttons for key sections:

4.5.3.1.1 A “Children” button must be visible and clearly labelled.

4.5.3.1.1.1 When clicked, the system must navigate the user to the Children Page.

4.5.3.1.2 A “Chat” button must be visible and clearly labelled.

4.5.3.1.2.1 When clicked, the system must navigate the user to the Chat Page, displaying all conversations.

4.5.3.1.3 A “Profile” button must be visible and clearly labelled.

4.5.3.1.3.1 When clicked, the system must navigate the user to the Profile Page, where account information can be viewed and updated.

4.5.3.2 The Parent Home Page must support real-time chat notifications.

4.5.3.2.1 The system must display chat notifications when new messages are received.

4.5.3.2.2 When a parent clicks on a chat notification, the system must navigate them directly to the specific chat conversation related to the notification.

4.5.3.3 The Parent Home page must support any announcement that has been sent out from the teacher user

4.6 Teacher Home Page

4.6.1 Description and priority

The Teacher Home Page serves as the main dashboard for teacher users after successful login. It provides access to key features such as viewing their notifications of chats from teachers. The interface must be clear, responsive, and focused on communication to support teacher-parent engagement. As this is the central hub for teachers within the application, this page has a high development priority.

4.6.2 Stimulus/Response Sequence

- When the teacher clicks on a chat notification, the system must navigate them directly to the specific chat conversation that triggered the notification.
- When the teacher clicks the “Class” button, the application must navigate them to the Class Page
- When the teacher clicks the “Chat” button, the application must navigate them to the Chat Page
- When the teacher clicks the “Profile” button, the application must navigate them to the Profile Page

4.6.3 Functional Requirement

4.6.3.1 The Teacher Home Page must display navigation buttons for key sections:

- 4.6.3.1.1 A “Class” button must be visible and clearly labelled.
- 4.6.3.1.1.1 When clicked, the system must navigate the user to the Classes they are teaching.
- 4.6.3.1.2 A “Chat” button must be visible and clearly labelled.
- 4.6.3.1.2.1 When clicked, the system must navigate the user to the Chat Page, displaying all conversations with parents.
- 4.6.3.1.3 A “Profile” button must be visible and clearly labelled.
- 4.6.3.1.3.1 When clicked, the system must navigate the user to the Profile Page

4.6.3.2 The Teacher Home Page must support real-time chat notifications.

- 4.6.3.2.1 The system must display chat notifications when new messages are received from parents.
- 4.6.3.2.2 When a teacher clicks on a chat notification, the system must navigate them directly to the specific chat conversation related to the notification.

4.7 Classes (Teacher)

4.7.1 Description and priority

The Classes Page is accessible exclusively to teacher users and serves as the core hub for managing and interacting with class-related data. It displays a list of all classes assigned to the teacher and acts as the main entry point for navigating to other features such as sending out announcements, assigning homework, attendance taking and receiving documentation. As a foundational component for multiple UI flows, this page has a high development priority.

4.7.2 Stimulus/Response Sequence

- When the teacher clicks on a class card, the application must navigate the user to the corresponding Class UI Page, where class-specific information and actions are displayed.
- When the teacher clicks the “Home” button, the application must navigate the user to the Teacher Home Page.
When the teacher clicks the “Chat” button, the application must navigate the user to the Chat Page
- When the teacher clicks the “Profile” button, the system must navigate the user to the Profile Page

4.7.3 Functional Requirement

4.7.3.1 Displays a scrollable list of all classes assigned to the teacher

4.7.3.2 Each class item/card includes:

4.7.3.2.1 Class Name (e.g., “Grade 3A”)

4.7.3.2.2 Teacher Role:

4.7.3.2.2.1 If the teacher is assigned as a form teacher, display “Form Teacher”

4.7.3.2.2.2 If the teacher is assigned a subject only, display “Subject Teacher”

4.7.3.3 On Tap: Tapping on a class card navigates to the Class Details Page for that class.

4.8 Announcement (Teacher)

4.8.1 Description and priority

The Announcement feature allows teachers to communicate important updates to parents via the specific Class UI. Teachers can post new announcements and view a list of existing ones. Each announcement can be toggled between “Open” and “Closed” to control visibility. This feature is essential for timely communication and has a high development priority.

4.8.2 Stimulus/Response Sequence

- When the teacher selects “Add Announcement”, the system opens the Add Announcement Page
- When the teacher selects “Announcement list”, the application opens the Announcement list Page
- After submitting the title and content, the system confirms the post and returns to the Class UI page
- The teacher can toggle the status of an announcement between Open and Closed in the announcement list page

4.8.3 Functional Requirement

4.8.4 Functional requirement for Announcement List

4.8.4.1 Page Overview

4.8.4.1.1 Displays a list of all announcements created for a specific class.

4.8.4.1.2 The page is titled “Announcements” and is accessible from the Class Details Page.

4.8.4.2 Announcement Display

4.8.4.2.1 Each announcement includes the following information:

4.8.4.2.2 Title of the announcement (e.g., “Consent Forms Due Tomorrow”)

4.8.4.2.3 Content (e.g., “Please submit the signed forms by Friday.”)

4.8.4.2.4 Created By: The name of the teacher who posted the announcement

4.8.4.2.5 Date Created: Displayed in Singapore date format (e.g., “6 April 2025”)

4.8.4.2.6 Status:

4.8.4.2.6.1 Displayed as “Open” (green text) or “Closed” (red text)

4.8.4.3 Interaction

4.8.4.3.1 Tap to Toggle:

4.8.4.3.1.1 Tapping on an announcement toggles its status between “Open” and “Closed”, indicating whether the announcement is currently active or archived.

4.8.4.3.2 Visual Feedback:

4.8.4.3.2.1 Announcements are shown in clean cards with spacing between them.

4.8.4.3.2.2 If there are no announcements, display a message:

4.8.4.3.2.3 “No announcements for this class.”

4.8.5 Add announcement

4.8.5.1 Page Overview

4.8.5.1.1 Allows teachers to create a new announcement for a specific class.

4.8.5.1.2 The page is titled “Add Announcement” and is accessible from the Class Details Page.

4.8.5.2 Input Fields

4.8.5.2.1 Title:

4.8.5.2.1.1 A required text field for the name of the announcement (e.g., “Exam Reminder”).

4.8.5.2.2 Content:

4.8.5.2.2.1 A required multiline text field for the announcement details (e.g., “Science exam on Friday at 9am”).

4.8.5.2.2.2 Minimum height ensures comfortable typing space for longer messages.

4.8.5.3 Submission Flow

4.8.5.3.1 Submit Announcement Button:

4.8.5.3.2 Tapping this button submits the announcement to the system.

4.8.5.4 If either the title or content is missing, the teacher is prompted with an alert to complete all fields.

4.8.5.5 Upon successful submission:

4.8.5.5.1 A confirmation message is shown (e.g., “Announcement added.”).

4.8.5.5.2 The user is navigated back to the previous screen.

4.8.5.6 If submission fails, an error message is displayed.

4.9 Homework (Teacher)

4.9.1 Description and priority

The Homework feature allows teachers to assign tasks to students via the specific Class UI. Teachers can create new homework entries and view existing assignments. This helps maintain structured learning outside of class and keeps parents informed. As a recurring task for most teachers, this feature has a high development priority.

4.9.2 Stimulus/Response Sequence

- When the teacher selects “Homework List” from the Class UI, the system displays the Homework List Page.
- The teacher can toggle between open and close in the homework list page to change the status of the homework
- When the teacher clicks “Assign Homework”, they are taken to a form to enter details.
- After clicking the submit button in the Assign homework page, a confirmation message is shown, and the new homework is added to the Homework List page.

4.9.3 Functional Requirement

4.9.3.1 Homework List Page

4.9.3.1.1 The system must display a list of all homework entries assigned to a specific class.

4.9.3.1.2 The Homework List Page must be titled “Homework” and must be accessible from the Class Details Page.

4.9.3.1.3 Each homework entry must be presented as a card and must include:

4.9.3.1.3.1 Title of the homework (e.g., “Math Revision Worksheet”)

4.9.3.1.3.2 Content or description of the task (e.g., “Complete exercises 1–10 from the workbook”)

4.9.3.1.3.3 Date Created: Displayed in Singapore date format (e.g., “12 April 2025”)

4.9.3.1.3.4 Status: Displayed as “Open” (green text) or “Closed” (red text)

4.9.3.1.4 Tapping on a homework card must toggle its status between “Open” and “Closed,” indicating whether the homework is currently active or not.

4.9.3.1.5 If there are no homework entries available, the system must display a message: “No homework assigned for this class.”

4.9.3.2 Assign Homework Page

4.9.3.2.1 The page must allow teachers to create a new homework entry for the selected class.

4.9.3.2.2 The page must be titled “Assign Homework” and must be accessible from the Homework List Page.

4.9.3.2.3 The form must include the following input fields:

4.9.3.2.3.1 Title: A required single-line text field to name the homework (e.g., “English Essay”)

4.9.3.2.3.2 Content: A required multi-line text field to describe the homework details

4.9.3.2.3.2.1 The content box must have a minimum height to accommodate longer inputs comfortably.

4.9.3.2.4 The page must include a “Submit” button to confirm the creation of the homework.

4.9.3.2.4.1 If either the title or content is left empty, the system must prompt the teacher with an alert to complete all fields.

4.9.3.2.4.2 Upon successful submission, the system must display a confirmation message (e.g., “Homework assigned.”) and navigate the user back to the Homework List Page.

4.9.3.2.4.3 If submission fails due to technical error, the system must display an error message (e.g., “Failed to submit homework. Please try again.”)

4.10 Documentation (Teacher)

4.10.1 Description and priority

The Documentation Page allows teachers to view documents uploaded by parents for a specific student and to add their own documentation if necessary. Accessible only through the specific child’s profile, this feature supports sharing of medical certificates, permission forms, reports, and other supporting documents. It helps facilitate administrative communication and record-keeping, making it a medium development priority.

4.10.2 Stimulus/Response Sequence

- When the teacher clicks the “Documentation” button, the application must navigate to the Documentation Page, showing all documents uploaded for that student.

- When the teacher clicks the “Add Documentation” button, the system must display a form for entering document details and uploading a file.
- When the teacher clicks the “Submit” button, the system must upload the file and update the list.
- When the teacher clicks on a PDF document, the system must offer an option to open it in the browser.

4.10.3 Functional Requirement

4.10.3.1 The Documentation Page must be accessible only through a specific child's profile page.

4.10.3.2 The page must display a list of all documents uploaded for that student, whether uploaded by the parent or the teacher

4.10.3.3 Each document entry must include the following information:

4.10.3.3.1 Document Title (e.g., “Medical Certificate - 12 Apr”)

4.10.3.3.2 Upload Date: Displayed in Singapore date format (e.g., “15 April 2025”)

4.10.3.3.3 File Type/Icon (e.g., PDF, image, etc.)

4.10.3.4 If no documents have been uploaded, the system must display a placeholder message: “No documents submitted.”

4.10.3.5 A clearly labelled “Add Documentation” button must be available on the page.

4.10.3.5.1 Clicking this button must open a form that allows the teacher to:

4.10.3.5.1.1 Enter a title or brief description of the document (required)

4.10.3.5.1.2 Upload a file (e.g., PDF, image, or document file)

4.10.3.6 The form must include a “Submit” button to upload the document.

4.10.3.6.1 If required fields (title or file) are missing, the system must prompt the user with an alert to complete the form.

4.10.3.6.2 Upon successful submission, the system must display a confirmation message (e.g., “Document uploaded successfully.”) and return to the Documentation Page with the newly added document visible in the list.

4.10.3.6.3 If submission fails, an appropriate error message must be displayed (e.g., “Upload failed. Please try again.”)

4.10.3.7 If the uploaded file is a PDF, the system must display an “Open in Browser” option beside the file, allowing teachers to view it in a new tab or browser window.

4.11 Attendance (Teacher)

4.11.1 Description and priority

The Attendance feature enables teachers to record the presence or absence of students for each class. Teachers can mark attendance either from the Class UI, where they toggle students as “Present” or “Absent,” or from within an individual child’s profile. When marking a student as present from the child profile, teachers also have the option to upload a photo as proof of attendance. This feature ensures accurate tracking and verification of student presence, making it a high development priority for classroom management and accountability.

4.11.2 Stimulus/Response Sequence

- When the teacher accesses the specific ClassUI, they can tap on a student’s attendance status to toggle between “Present” and “Absent
- When the teacher opens a student’s profile, they can manually mark the student as “Present” and optionally upload a photo as verification
- Upon confirmation, the system saves the updated attendance record and any associated image
- If a photo is uploaded, the system attaches it to the attendance log for that student on the selected date

4.11.3 Functional Requirement

4.11.3.1 The Attendance feature must be accessible from both the Class UI Page and the individual child’s profile page.

4.11.3.2 Each student listed in the Class UI must display an attendance status indicator with one of the following values:

4.11.3.2.1 Present (green indicator)

4.11.3.2.2 Absent (red indicator)

4.11.3.3 Tapping on a student’s attendance status from the Class UI must toggle the value between Present and Absent.

4.11.3.4 Changes to attendance status must be saved immediately upon toggling or confirmation.

4.11.3.5 When the teacher accesses a student’s profile, the system must allow manual marking of the student as Present

4.11.3.6 The system must also allow the teacher to upload a photo as proof of attendance when marking from the profile view.

4.11.3.7 If a photo is uploaded, it must be saved and linked to the specific attendance record for that student on that date.

4.11.3.8 The system must display a confirmation message once attendance is successfully recorded.

4.11.3.9 If any upload or save action fails, the system must show an error message (e.g., "Failed to save attendance. Please try again.")

4.11.3.10 Each recorded attendance entry must be logged and retrievable by date for reporting and review purposes.

4.12 Grades (Teacher)

4.12.1 Description and priority

The Grades feature allows teachers to manage and view students' performance in various tests within a specific class. Accessible from the specific Class UI, teachers can add a new test by entering scores for each student or review results of previously added tests. This functionality is essential for tracking academic progress with parents. Given its educational value and integration with class data, this feature has a high development priority.

4.12.2 Stimulus/Response Sequence

- When the teacher clicks the "Grades" button in the Class UI, the system displays a list of existing test entries.
- When the teacher clicks "Add New Test", the system navigates to a form where they can input the test name and enter grades for each student
- Upon submission, the system saves the test and displays a confirmation message and the new test appears in the list as a test card.
- When the teacher taps on a test card, the system navigates to a detailed view showing each student's score for that specific test

4.12.3 Functional Requirement

4.12.3.1 Teachers will be able to view their a list of test that the students in their class have taken

4.12.3.2 Teachers will be able to click into each individual test to view information about each test

4.12.3.2.1 The name of the test is displayed

4.12.3.2.2 The class is displayed

4.12.3.2.3 Teachers will be presented with an overview of the test's class statistics

4.12.3.2.3.1 Average is displayed

- 4.12.3.2.3.2 Median is displayed
- 4.12.3.2.3.3 Mode is displayed
- 4.12.3.2.3.4 Max is displayed
- 4.12.3.2.3.5 Min is displayed
- 4.12.3.2.4 A bar chart showing the student's performance is displayed
- 4.12.3.2.5 A line chart showing the student's performance is displayed
- 4.12.3.2.6 A scrollable list of the children in the class is displayed. For each children,
 - 4.12.3.2.6.1 Name is displayed
 - 4.12.3.2.6.2 Score is displayed
 - 4.12.3.2.6.3 A slider representing the score against the total is displayed
- 4.12.3.3 Teachers will be able to click the "add new test" button to upload a new test scores
 - 4.12.3.3.1 New Test is displayed
 - 4.12.3.3.2 Class is displayed
 - 4.12.3.3.3 The field "Test Name" is displayed, allowing the teacher to type in the name of the test
 - 4.12.3.3.4 A scrollable list of children in the class is displayed. For each children,
 - 4.12.3.3.4.1 Name is displayed
 - 4.12.3.3.4.2 Score is displayed through a numeric value that can be edited
 - 4.12.3.3.4.3 Score is displayed through a slider that can be dragged
 - 4.12.3.3.5 Teachers will be able to click the "Save Test" button to upload the test scores onto the database for parents to view

4.13 Children (Parent)

4.13.1 Description and priority

The Children page is exclusive to parent users and serves as the central dashboard for accessing information related to their child or children. Each child is displayed as an individual card containing their name. From this page, parents can navigate to their Child UI, which branches into features such as Homework, Documentation, Attendance, Grades, and Child Mode. As it forms the entry point to all child-specific views, this page has a high development priority.

4.13.2 Stimulus/Response Sequence

- When the parent clicks on a child card, the application must navigate the user to the specific ChildUI Page, where child-specific information and actions are displayed.
- When the parent clicks the "Home" button, the application must navigate the user to the Parent Home Page.
- When the parent clicks the "Chat" button, the application must navigate the user to the Chat Page.
- When the parent clicks the "Profile" button, the system must navigate the user to the Profile Page.

4.13.3 Functional Requirement

4.13.3.1 The Children Page must be accessible exclusively to parent users after successful login.

4.13.3.2 The page must display a scrollable list of child cards, with each card representing one of the parent's registered children.

4.13.3.3 Each child card must display the child's full name

4.13.3.4 When the parent clicks on a child card, the system must navigate them to that child's dedicated Child UI Page, where they can access related features.

4.13.3.5 The Children Page must dynamically fetch and display all linked child profiles from the backend upon page load.

4.13.3.6 If no children are associated with the account, the system must display a placeholder message such as: "No children linked to this account."

4.14 Homework (Parents)

4.14.1 Description and priority

The Homework feature allows parents to view homework that has been assigned by teachers to their child. This page is accessed through the Child UI and provides parents with current homeworks or overdue homeworks to help them support their child's learning. As it promotes parental involvement and accountability, this feature has a high development priority.

4.14.2 Stimulus/Response Sequence

- When the parent clicks the "Homework List" button, the application navigates to the Homework Page for that child, where there is a list of homework entries

4.14.3 Functional Requirement

4.14.3.1 The Homework Page must be accessible through the Child UI via a clearly labelled "Homework List" button.

4.14.3.2 The system must display a list of all homework entries assigned by the teacher to the selected child.

4.14.3.3 Each homework entry must include the following details:

4.14.3.3.1 Title of the homework (e.g., "Science Revision")

4.14.3.3.2 Description or task details (e.g., "Complete Chapter 3 worksheet")

4.14.3.3.3 Assigned date and due date, both displayed in Singapore date format

4.14.3.3.4 If there are no homework entries, the system must display a message such as: “No homework assigned for this child.”

4.15 Documentation (Parent)

4.15.1 Description and priority

The Documentation feature allows parents to upload and manage important documents related to their child (e.g., medical certificates, permission slips, or supporting materials). Accessed via the Child UI, this feature provides a dedicated space for submitting and reviewing previously uploaded files. PDF documents include an option to be opened directly in the browser for easier viewing. Since it supports communication and verification between parents and teachers, this feature has a medium priority.

4.15.2 Stimulus/Response Sequence

- When the parent clicks the “Documentation” button, the system navigates to the Documentation Page, displaying a list of previously uploaded documents.
- When the parent clicks the “Add Documentation” button, the system displays a form allowing them to upload a new document and optionally add a title or description.
- When the parent clicks the “Submit” button, the system uploads the document and updates the list.
- If the uploaded file is a PDF, an “Open in Browser” option is shown, allowing parents to view it in a new tab or window.

4.15.3 Functional Requirement

4.15.3.1 The Documentation Page must be accessible from the **Child UI** via a clearly labelled “**Documentation**” button.

4.15.3.2 The system must display a list of all previously uploaded documents related to the selected child.

4.15.3.3 Each document entry must show the following information:

4.15.3.3.1 **Title or filename** of the document

4.15.3.3.2 **Upload date**, displayed in Singapore date format (e.g., “18 April 2025”)

4.15.3.3.3 **Uploader** (if teacher-uploaded documents are also visible)

4.15.3.4 If there are no documents uploaded, the system must display a message such as: “**No documents uploaded yet.**”

4.15.3.5 The page must include a clearly visible “**Add Documentation**” button.

Clicking the button must open a form that allows the parent to:

4.15.3.5.1 Upload a file (PDF, image, or document format)

4.15.3.5.2 Optionally provide a **title or description** for the document

4.15.3.6 The form must include a “**Submit**” button to complete the upload process.

4.15.3.6.1 If required fields (file upload) are missing, the system must alert the parent to complete the form.

4.15.3.6.2 Upon successful submission, the document must be added to the top of the list and a **confirmation message** must be displayed.

4.15.3.6.3 If the file upload fails, an **error message** must be shown (e.g., “Failed to upload. Please try again.”)

4.15.3.7 If the uploaded document is a **PDF**, the system must display an “**Open in Browser**” link that opens the document in a new tab or browser window

4.15.3.8 The system must sync all document uploads with the backend to ensure consistent availability across sessions and devices.

4.16 Attendance (Parent)

4.16.1 Description and priority

The Attendance feature allows parents to view their child’s attendance record through the Child UI. It provides a visual calendar or list of attendance entries, where green indicators represent days the child was present and red indicators represent absences. For each attendance entry, the parent can click on a specific date to view photo proof if it was uploaded by the teacher. This feature promotes accountability, making it a high development priority for both communication and verification.

4.16.2 Stimulus/Response Sequence

- When the parent clicks the “Attendance Record” button, the system navigates to the Attendance Page, displaying a visual list of the calendar.
- When the parent clicks on a specific date, the system displays the photo proof associated with that day

4.16.3 Functional Requirement

4.16.3.1 The Attendance Page must be accessible from the Child UI via a clearly labelled “Attendance Record” button.

4.16.3.2 The page must display a visual calendar or list view of attendance records for the selected child

4.16.3.3 Each date on the calendar or list must be color-coded to indicate the child’s attendance status:

- 4.16.3.3.1 Green for days the child was marked Present
- 4.16.3.3.2 Red for days the child was marked Absent
- 4.16.3.4 When the parent clicks on a specific date, the system must display any photo proof uploaded by the teacher for that date if it is available
- 4.16.3.5 If a photo has been uploaded, it must be shown in a viewer or expandable format.
- 4.16.3.6 If no photo was uploaded, the system must display a message such as: "No photo available for this date."
- 4.16.3.7 The system must ensure attendance data is synced from the backend and reflects the most up-to-date records.
- 4.16.3.8 The interface must be responsive and accessible across mobile and desktop devices.

4.17 Grades (Parents)

4.17.1 Description and priority

The Grades feature allows parents to monitor their child's academic performance across various tests. Accessed from the Child UI, this page displays a list of individual tests along with the child's scores, and provides an overall performance summary including statistics such as average, median, mode, maximum, and minimum scores. This gives parents a clear and data-driven overview of their child's academic progress, making this feature a high development priority for academic tracking and feedback.

4.17.2 Stimulus/Response Sequence

- When the parent clicks the "Grades" button, the system opens the Grades Page showing the list of all the test the child has taken and the performance summary

4.17.3 Functional Requirement

- 4.17.3.1 Parents will be able to view their children's performance in school
- 4.17.3.2 Parents will be able to see one to three different colours in a pie chart indicating the child's overall performance
 - 4.17.3.2.1 Green portions of the pie chart indicates the child has done excellent
 - 4.17.3.2.2 Yellow portions of the pie chart indicates the child has done average
 - 4.17.3.2.3 Red portions of the pie chart indicates the child has done poor
- 4.17.3.3 There is a colour legend at the bottom
- 4.17.3.4 Parents will be able to see the individual test grades for the child

- 4.17.3.4.1 Name of the test is displayed
- 4.17.3.4.2 Score is displayed
- 4.17.3.4.2.1 Score is displayed in green if the child does well
- 4.17.3.4.2.1.1 “Excellent” is displayed
- 4.17.3.4.2.2 Score is displayed in yellow if the child does average
- 4.17.3.4.2.2.1 “Average” is displayed
- 4.17.3.4.2.3 Score is displayed in red if the child does poorly
- 4.17.3.4.2.3.1 “Poor” is displayed
- 4.17.3.4.3 Class is displayed
- 4.17.3.4.4 Statistics are displayed
- 4.17.3.4.4.1 Average is displayed
- 4.17.3.4.4.2 Median is displayed
- 4.17.3.4.4.3 Mode is displayed
- 4.17.3.4.4.4 Max is displayed
- 4.17.3.4.4.5 Min is displayed

4.18 Child Mode (Parents)

4.18.1 Description and priority

The Child Mode feature provides a simplified and secure version of the app that is safe for children to use independently. It is accessible from the Child UI and limits visibility to essential features like homework viewing. It also includes location tracking functionality, which helps parents monitor when their child leaves school. Parents can enable or disable Child Mode, and a special exit pin code is required to prevent unauthorized exit. This feature supports child safety and focused interaction, making it a high development priority.

4.18.2 Stimulus/Response Sequence

- When the parent clicks the “Child Mode” button, the system enables Child Mode.
- In Child Mode, the child can click the “I am leaving school” button, which triggers a location update to the parent and begins tracking the child.
- The parent can initiate tracking by clicking the “Activate Tracking” button in the Child UI.
- To exit Child Mode, the user must click the “Exit Child Mode” button and enter the correct PIN code.
- Below the Child Mode toggle, there is a “Change PIN” button.
- When the parent clicks “Change PIN”, the system prompts them to enter a new PIN and confirm it.

4.18.3 Functional Requirement

- 4.18.3.1 Page Overview
- 4.18.3.1.1 Activated when a parent presses the top right button from the child’s detail screen
- 4.18.3.1.2 Provides a limited and safe interface specifically designed for children.

- 4.18.3.1.3 Prevents navigation gestures to exit the screen unintentionally.
- 4.18.3.2 Homework Display
 - 4.18.3.2.1 A scrollable list of the child's currently assigned homework is shown.
 - 4.18.3.2.2 Each homework card displays:
 - 4.18.3.2.2.1 Homework Title
 - 4.18.3.2.2.2 Description
 - 4.18.3.2.2.3 Due Date
- 4.18.3.3 Location Tracking
 - 4.18.3.3.1 "I'm Leaving Home/School" Button:
 - 4.18.3.3.1.1 If location tracking is not already active, this button starts real-time foreground tracking.
 - 4.18.3.3.1.2 Triggers location updates to be sent to the backend.
 - 4.18.3.3.2 If tracking is currently active, display a visible banner
- 4.18.3.4 Exit Child Mode
 - 4.18.3.4.1 "Exit Child Mode" Button:
 - 4.18.3.4.1.1 Opens a modal requiring the user to enter a 4-digit PIN (exit code).
 - 4.18.3.4.1.2 PIN is validated against the one set by the parent.
 - 4.18.3.4.1.3 If correct:
 - 4.18.3.4.1.3.1 Child Mode ends.
 - 4.18.3.4.1.3.2 Location tracking is stopped.
 - 4.18.3.4.1.3.3 User is navigated back to the parent view.
 - 4.18.3.4.1.4 If incorrect:
 - 4.18.3.4.1.4.1 An error alert is shown: "Incorrect Code"
- 4.18.3.5 UX Safeguards
 - 4.18.3.5.1 Navigation gestures are disabled while Child Mode is active to prevent accidental exit.
 - 4.18.3.5.2 Child mode password is fetched securely from the backend upon entry.

4.19 Chat

4.19.1 Description and priority

The Chat Page facilitates direct, real-time communication between teachers and parents. It allows users to exchange messages regarding student-related matters in a private, user-friendly interface. Each conversation includes a message thread, a text input box, and a "Send" button. This feature is vital for quick clarification, progress updates, and school-parent engagement, making it a high development priority for both user types.

4.19.2 Stimulus/Response Sequence

- When the user clicks on a specific chat, the application must navigate them directly to the specific chat conversation.

- When the user types a message and clicks the “Send” button, the system must display the message in the chat thread and deliver it to the other party.
- When the user clicks the “Home” button, the application must navigate them to their respective Home Page.
- When the parent user clicks the “Children” button, the application must navigate them to the Children Page
- When the teacher user clicks the “Classes” button, the application must navigate them to the Class page.
- When the user clicks the “Profile” button, the application must navigate them to the Profile Page.

4.19.3 Functional Requirement

4.19.3.1 The Chat Page must display a list of all ongoing 1-to-1 chats between the parent and their child’s teachers.

4.19.3.2 Each chat item must display:

- 4.19.3.2.1 the teacher’s name
- 4.19.3.2.2 teacher’s profile picture (optional)
- 4.19.3.2.3 a preview of the last message
- 4.19.3.2.4 the timestamp of the last message.

4.19.3.3 Tapping on a chat item must navigate the user to the Chat Page for that specific teacher.

4.19.3.3.1 The chat Page must include a message input box that allows parents to type messages, supporting both text and emojis.

4.19.3.3.2 A Send button must be available to send the composed message to the teacher.

4.19.3.3.3 Messages must display their sent, delivered, and read statuses to provide feedback to the parent.

4.19.3.3.4 Parents must be able to attach and send images within the chat.

4.19.3.3.5 Image messages must appear inline within the conversation thread.

4.19.3.3.6 Chat history must be persisted and synced with the backend to ensure conversations are retained across sessions.

4.20 Profile

4.20.1 Description and priority

The Profile Page allows users to view and manage their personal account information. Users can update their phone number, address or other relevant information by clicking the “Edit” button, and securely log out of the application by selecting the “Logout” button. This page provides essential account control and supports user privacy and session management, making it a high development priority.

4.20.2 Stimulus/Response Sequence

- When the user clicks the “Edit” button, the system must allow the user to update editable fields such as name or contact information.
- When the user clicks the “save” button, the system must update the profile data and confirm the update with a success message.
- When the user clicks the “Logout” button, the system must log the user out and redirect them to the Login Page.
- When the parent user clicks the “Children” button, the system must navigate them to the Children Page.
- When the teacher user clicks the “Classes” button, the system must navigate them to the Class Page.
- When the user clicks the “Home” button, the system must navigate them to their respective Home Page.
- When the user clicks the “Chat” button, the application must navigate them to the Chat Page

4.20.3 Functional Requirement

4.20.3.1 Users will be able to edit their profile information by clicking on the ‘Edit’ button at the top right hand corner.

4.20.3.1.1 If the User clicks on the “Edit” button, information that can be edited such as Phone or Work Number will have a corresponding input box

4.20.3.1.2 For information that are fixed such as name and email, the container for the information will be greyed out and non-interactable

4.20.3.2 Users will be able to view their personal information in the profile page

4.20.3.2.1 Users will be able to view their profile photo displayed within a circular border

4.20.3.2.1.1 Users registered full name will be displayed in the profile page

4.20.3.2.1.2 Users contact information will be displayed in the profile page

4.20.3.2.1.3 Contact information includes details such as the phone number, email, work number and the home address

4.20.3.3 A logout button for users to log out of the current account

5. Other Nonfunctional Requirements

5.1 Performance Requirements

5.1.1 When a User (parent or teacher) sends a message, announcement, homework, document or any sort of update, the system must process and display the response within 5 seconds

5.1.2 The application should be able to redirect the user to an external integrated service, like website or in-built application within 10 seconds

5.1.3 If location tracking is enabled, the system must provide the real-time location updates with an accuracy of at most 20 meters and a maximum update delay of 10 seconds.

5.2 Safety Requirements

5.2.1 The application must undergo comprehensive security and safety testing before each major release to identify and address potential risks

5.2.2 The application must be designed to prevent psychological or emotional harm to children by incorporating age-appropriate content, language and interfaces that avoid stress, fear or confusion

5.2.3 The application must ensure the security and privacy of user data at all times so as to prevent unauthorised access or breaches

5.3 Security Requirements

5.3.1 Password field should be masked when the user is typing it in to deter others from looking at the user's password when typing it in

5.3.2 The database must automatically delete polled location data after a specified retention period (e.g.24 hours), This ensures compliance with data minimization principles and child data regulations

5.3.3 All third-party integration must be vetted for compliance with child safety and data protection standards.

5.4 Software Quality Attributes

5.4.1 **Scalability:** The system must be designed to support new features such as health check-ins, learning modules, progress tracking dashboards and multilingual support for diverse families. These features should be added with minimal disruption to existing functionality.

5.4.2 **Supportability:** The application must be able to support at least 200,000 concurrent users across different roles without compromising performance.

5.4.3 **Reliability:** The app must maintain an uptime of 99.9% with no more than 1 hour of planned downtime per year. Redundancy and automated failover mechanism should be implemented to ensure consistent access to core features like messaging and location tracking.

5.5 Business Rules

5.5.1 User

5.5.1.1 Parent User

- Users can choose to either accept or reject the location access functionality based on their privacy preferences

5.5.1.2 Teacher User

- Teachers must sign up with their official Ministry of Education (MOE)-issued email so as to prevent any malicious users from joining
- Teachers are not permitted to access data unrelated to their assigned classes

5.5.2 Developers

- Developers must maintain and update data protection policies in accordance with child online safety regulations
- Developers have the authority to suspend or remove users who violate the platform's rule or is deemed to be malicious
- Developers can access system-level logs and data in anonymised formats only for maintenance, debugging and analytics purposes

6. Other Requirements

<Define any other requirements not covered elsewhere in the SRS. This might include database requirements, internationalization requirements, legal requirements, reuse objectives for the project, and so on. Add any new sections that are pertinent to the project.>

Appendix A: Glossary

| Term | Definition |
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| Relevant Authorities | Includes emergency services such as police and ambulance, as well as school administrators and teachers who receive notifications in cases of emergency or unauthorized location changes. |

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| Check-In/Check-Out | A system-generated confirmation when a child reaches or leaves a designated location (e.g., school, child care center). Notifications are sent to parents and relevant authorities. |
| Real-Time Tracking | A feature that continuously monitors the child's location in small intervals, ensuring they remain in approved locations and generating alerts if they deviate. Uses GPS-based location verification. |
| User Interface (UI) | The interactive and visual components of the application, used by parents, teachers, and administrators to navigate features such as messaging, tracking, and attendance. |
| Notifications | Alerts or updates sent to users regarding child check-ins/check-outs, emergency alerts, homework, announcements, or system updates. Notifications must be delivered within one minute. |
| Emergency Contact Integration | A system allowing children to quickly contact parents, emergency services, or school staff in case of distress. Dedicated buttons enable instant police, ambulance, or parental contact within 10 to 30 seconds. |
| GPS-Based Location Verification | A feature that confirms whether the child is within a designated safe zone or an expected route, ensuring real-time tracking reliability. |
| Digital Consent Forms | A secure platform for parents to sign and submit digital forms related to school activities, medical authorizations, and field trips. Automated reminders are sent for pending submissions. |

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| Secure Communication | A one-on-one encrypted messaging system between parents and teachers. Group messaging is not allowed to maintain privacy and security. Teachers can send group announcements instead. |
| Attendance Tracking | A feature allowing teachers and parents to monitor a child's school presence, with automated check-in notifications and the ability to manually update attendance if GPS tracking fails. |
| Announcement System | A structured communication system where teachers and school staff can send group updates regarding school events, safety alerts, and assignments. Parents can filter, search, and mark announcements as read. |
| Emergency Alerts | Critical notifications sent in cases of injury, unauthorized location changes, or other emergencies. Measured in seconds. |
| Child Mode | A restricted version of the app for child users, allowing them to view homework, use emergency call buttons, and interact with essential features under parental control. To exit Child Mode, a security PIN is required. |
| Taskbar Navigation | A persistent bottom menu that allows users to access key pages: Home, Children, Chat, School, and Profile (for parents) or Home, Classes, Chat, School, and Profile (for teachers). |
| Locale Settings | User-configurable preferences for language and region-based settings. The app automatically detects the preferred language based on device settings. |
| Uptime | The percentage of time the system remains operational. |

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| System Reboot | The process of restarting the application or server due to an unplanned failure or update. |
| Automated Notifications | System-generated alerts for check-ins, check-outs, announcements, and emergency events. |
| Check-in/Check-out Request | A user action logging a child's arrival or departure in the system, triggering automatic notifications to parents and teachers. |
| SQL (Structured Query Language) | The language used to manage and query the relational database of the application. |
| Third-Party Integration | The ability to connect the system with external applications such as school management platforms, emergency contact services, Google Maps, and weather APIs. |
| User | Any individual using the application, including parents, teachers, administrators, and emergency responders. |
| Usability | The app provides a touch-friendly user interface, multi-language support, tooltips, and accessibility features such as screen readers and high-contrast mode. |
| Reliability | The amount of time the system remains fully functional with automated notifications. |
| Performance | The speed at which the system processes check-in and check-out requests, verify GPS-based location and deliver notifications without compromising resource usage. |

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| Supportability | The system must support seamless updates, minimal downtime for feature enhancements, database compatibility with SQL, and integration with emergency and school management services. |
| Scalability | The system's capability to handle a huge amount of concurrent users, maintain performance benchmarks as more childcare centers are integrated, and ensure a modular architecture for future feature expansion. |
| MOE | Ministry of Education Singapore |
| Four national languages of Singapore | English, Chinese, Malay, Tamil |

Appendix B: Analysis Models

Class diagram is available in a separate file ClassDiagram.png

Full analysis models such as ClassDiagrams, SequenceDiagrams etc can be found within the main Lab5 deliverables folder

Appendix C: To Be Determined List

NIL

Source: http://www.frontiernet.net/~kwiegers/process_assets/srs_template.doc