Group Project

Child Growth Tracking

IDSA

12 December, 2025

PARTICIPANTS

Phan Ngọc Hạnh Nhi

Member

Lê Thị Minh Tươi

Member

Vũ Quang Huy

Member

Trần Trung Hậu

Member

OVERVIEW
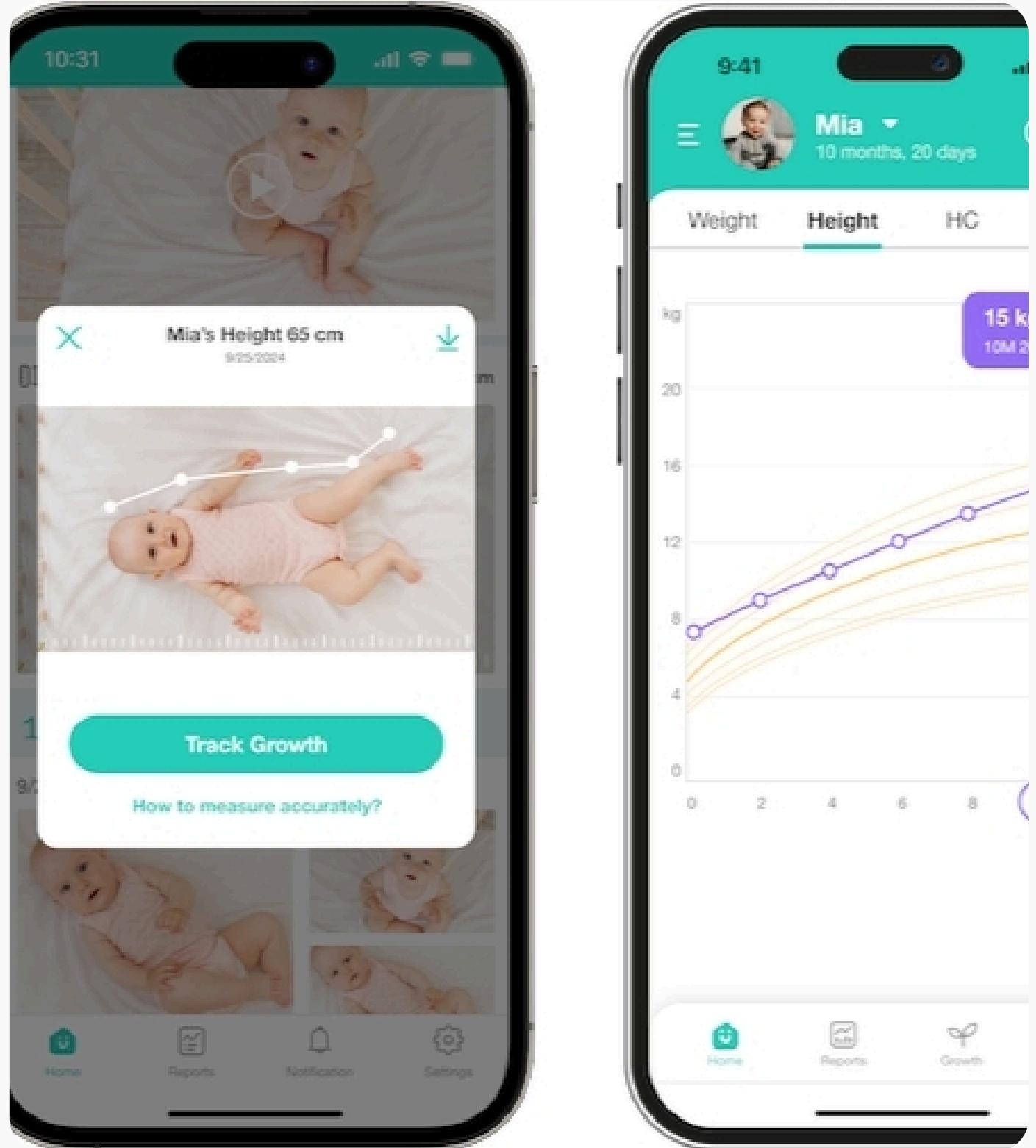
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Project Plan & Task Assignment

https://github.com/tuttotutti/Child_Growth_Tracking_System_CSW309

Child Growth Tracking

#	Task Name	Start Date	Deadline	Status	Notes	Completed Date	Assignee
1	Create shared folders & file templates	30/11	1/12	Done	Tạo folder chung (Docs, Diagrams), file template cho report	30/11	Nhi
2	System Overview + Scope	1/12	3/12	Done	Mô tả ngắn hệ thống là gì, ai dùng, làm gì/không làm gì (0.5–1 trang)	30/11	Nhi
3	Functional Requirements (FR)	3/12	5/12	Done	Liệt kê ~5–8 FR: hồ sơ trẻ, đo lường, biểu đồ, báo cáo, nhắc nhở…	30/11	Nhi
4	Non-functional Requirements (NFR)	3/12	5/12	Done	Liệt kê ~3–5 NFR: usability, performance, security, availability,…	30/11	Nhi
5	System Boundary (Actors + mô tả biên hệ thống)	5/12	7/12	Done	Xác định Parent, Caregiver, Doctor, Admin; mô tả bên trong/bên ngoài hệ thống		Tươi
6	Main Processes (Overall flow)	7/12	8/12	Done	Viết 5–7 bước luồng chính từ đăng nhập → tạo hồ sơ → nhập số đo → xem biểu đồ → xuất báo cáo		Nhi
7	Short Use Case list	4/12	5/12	Done	Danh sách UC + 1 câu mô tả ngắn cho mỗi UC		Tươi
8	Long Use Cases UC1–UC3	5/12	7/12	Done	Viết chi tiết UC1–UC3: mục tiêu, pre/post condition, main/alt flow		Tươi
9	Long Use Cases UC4–UC6	5/12	7/12	Done	Viết chi tiết UC4–UC6 tương tự UC1–UC3		Tươi
10	ERD	7/12	8/12	Done	Vẽ ERD: User, Child, Measurement, Notification, Report,…		Huy
11	DFD Level-0 draft	8/12	9/12	Done	Vẽ DFD Level-0: 1 process chính + external entities + data stores		Tươi
12	UML Use Case Diagram	9/12	10/12	Done	Vẽ Use Case Diagram dựa trên danh sách UC đã chốt		Hậu
13	Activity Diagram ("Record Measurement & View Chart")	10/12	11/12	To do	Vẽ Activity Diagram cho luồng nhập số đo & xem biểu đồ		Huy
14	Sequence Diagram?	10/12	10/12	Done	Vẽ tổng quát project		Tươi
15	UI			Done			Huy
16	Global review & consistency check	12/12	13/12	Done	Nhi review toàn bộ: check trùng tên, logic, nhất quán giữa biểu đồ & text		Nhi
17	Youtube Video						
18	Final formatting & submission package	13/12	14/12	To do	Chỉnh sửa cuối, format, đặt tên file, gom lại bản nộp cho thầy/cô		Tươi

1. Introduction

- Web/mobile system to help parents and caregivers track a child's physical growth over time.

- Stores key indicators: weight, height/length, head circumference, BMI.

- Compares measurements with medical growth standards such as WHO / CDC.

- Displays visual growth charts and allows parents to share data with doctors when needed.

Objectives & High-level Functions

System Objectives

- Securely store & manage the growth history of each child.
- Analyse & visualise growth using charts and percentiles so parents understand whether the child is below / within / above normal ranges.
- Support coordination between parents, caregivers and doctors through reminders, reports and data sharing.

High-level Functions (Overview)

- User & role management (Parent, Caregiver, Doctor, Admin).
- Child profile management (create, update, store multiple children).
- Periodic measurement recording, auto BMI & age calculation.
- Growth chart generation with WHO/CDC percentiles.
- Measurement reminders & notifications.
- Report export and sharing (PDF / CSV / images) for doctor visits.

2. *System Overview & Scope*

System Overview

- Web/mobile app for tracking children's physical growth over time.

- Stores key indicators: weight, height/length, head circumference, BMI.

- Shows visual growth charts and compares with WHO / CDC standards.

- Supports data sharing with doctors and other caregivers (grandparents, babysitters).

- Main user groups: Parent/Guardian, Caregiver, Doctor/Pediatrician, Admin.

Main Objectives

- Securely store and manage each child's growth history.

- Analyse and visualise data using charts and percentiles.

- Support coordination between parents, caregivers and doctors via reminders and reports

Scope

Scope (In this project)

- User & role management (Parent / Caregiver / Doctor / Admin).

- Child profile management for multiple children per parent.

- Measurement recording + BMI & age calculation.

- Growth chart analysis & percentile visualisation.

- Periodic reminders & notifications.

- Growth report generation & sharing (PDF / CSV / images).

Out of Scope

- No medical diagnosis or treatment decisions.

- No direct integration with hospital systems or smart devices (data entered manually).

3. Functional Requirements (FR) •••••

FR1 – User Registration & Authentication

- Create account with email & password, secure login.

FR2 – User Roles & Authorization

- Roles: Parent, Caregiver, Doctor, Admin with different permissions.

FR3 – Manage Child Profiles

- Create / view / update / deactivate child profiles; multiple children per parent.

FR4 – Record Growth Measurements

- Enter date, weight, height/length, head circumference; auto-calculate BMI & measurement age.

FR5 – View & Analyse Growth Charts

- Charts such as Age vs Weight / Height / BMI + position on percentile curves.

FR6 – Reminders & Notifications

- Configure measurement schedules (1 month, 3 months, …) and send alerts.

FR7 – Export & Share Growth Reports

- Generate reports (PDF / CSV / images), download or share via email / secure link.

FR8 – System Administration & Configuration

- Admin manages user accounts, monitors activity, configures WHO / CDC standards.

Non-functional Requirements (NFR)

NFR1 – Usability

- Simple, clear, user-friendly UI for non-technical parents; easy to create profile & enter data.

NFR2 – Performance

- Main pages and charts load within ≈3 seconds under normal network conditions.

NFR3 – Security & Privacy

- Encrypt passwords.

- Access only after authentication + proper authorisation.

- Users cannot see other children's data without permission.

NFR4 – Reliability & Availability

- Stable operation with high availability (24/7 except maintenance).

- Safe data storage + regular backups; no data loss from minor incidents.

NFR5 – Compatibility & Portability

- Works on major browsers (Chrome, Firefox, Edge, Safari).

- Responsive on desktop, tablet, mobile.

- Deployable on on-premise or cloud without major functional changes.

5. *Main Processes (Overall Flow)*

1. User login to the system

- Parent / caregiver opens the app, goes to Login, logs in with email & password.
- System authenticates and redirects to dashboard.

2. Create and manage child profiles

- Parent navigates to Children / Child Profiles.
- Create new child profile (name, gender, date of birth, preterm/full-term, photo).
- System validates and saves; parent can update later.

3. Record periodic growth measurements

- Parent / caregiver opens a child profile → Measurements.
- Enter weight, height/length, head circumference, measurement date.
- System validates, stores data, auto-calculates BMI & age at measurement.

4. Process and update growth data

- System updates child's growth history.
- Apply selected growth standard (WHO / CDC) for charting & percentile calculation.

Main Processes (Overall Flow)

5. View and interpret growth charts

- Parent / caregiver / doctor opens Growth Charts for a child.
- System shows charts (Age vs Weight/Height/BMI) + percentile zone (below / within / above normal).
- User can change time range, inspect data points.
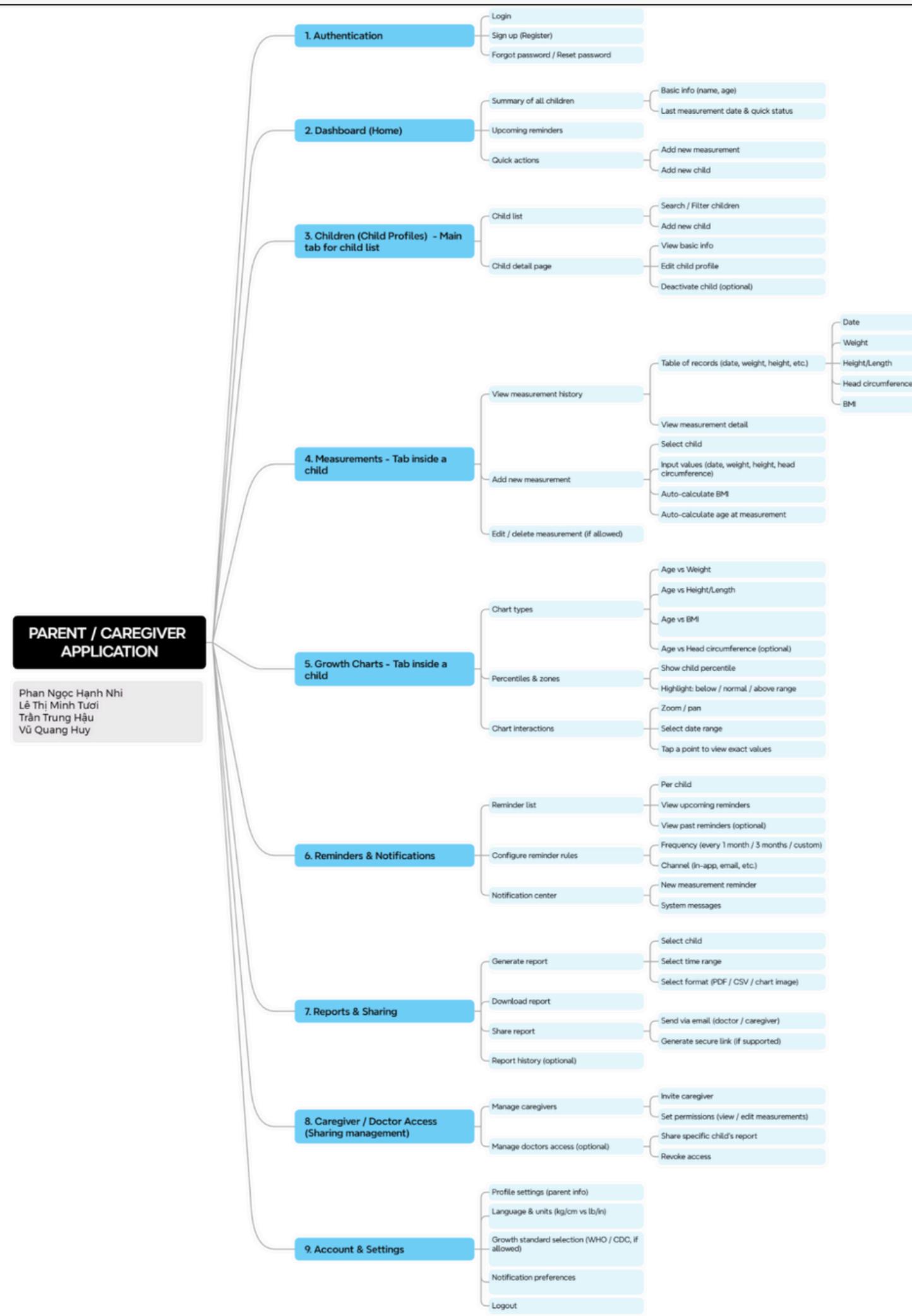
6. Receive reminders for future measurements

- Parent sets reminder schedule (monthly, quarterly, …) per child.
- At scheduled time, system sends in-app / email notification to record new measurements.

7. Generate and share growth reports

- Parent opens Reports, selects child, date range, report format (PDF/CSV/chart images).
- System generates report; parent can download or share with doctors/caregivers via secure link or email.
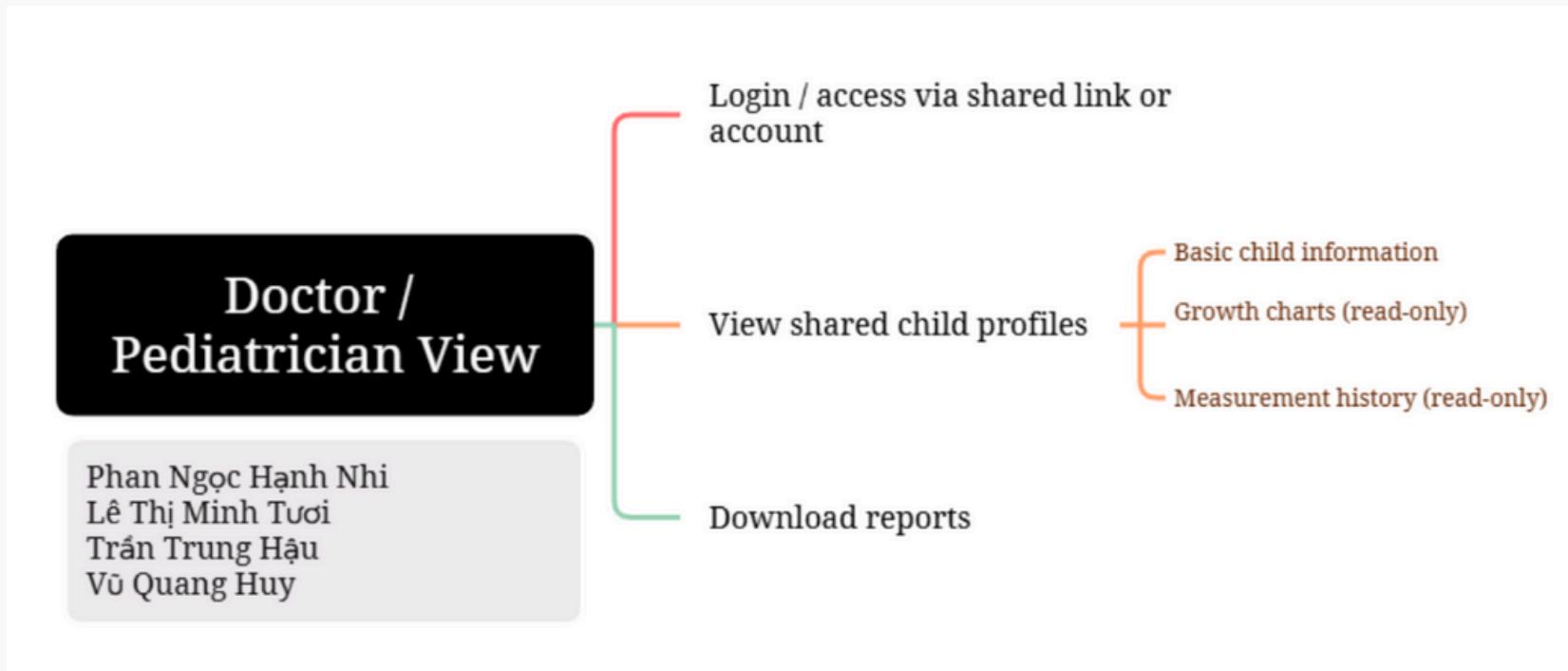
# Diagram overview System Parent / Caregiver Application

- **Authentication:** login, sign up, reset password.
- **Dashboard:** summary of children, upcoming reminders, quick actions.
- **Children, Measurements & Growth Charts for each child.**
- **Reminders & Notifications.**
- **Reports & Sharing, Caregiver/Doctor access, Account & Settings.**

Diagram overview System Doctor / Pediatrician View

Doctor / Pediatrician View

- Login / access via shared link or account
- View shared child profiles
  - Basic child information
  - Growth charts (read-only)
  - Measurement history (read-only)
- Download reports

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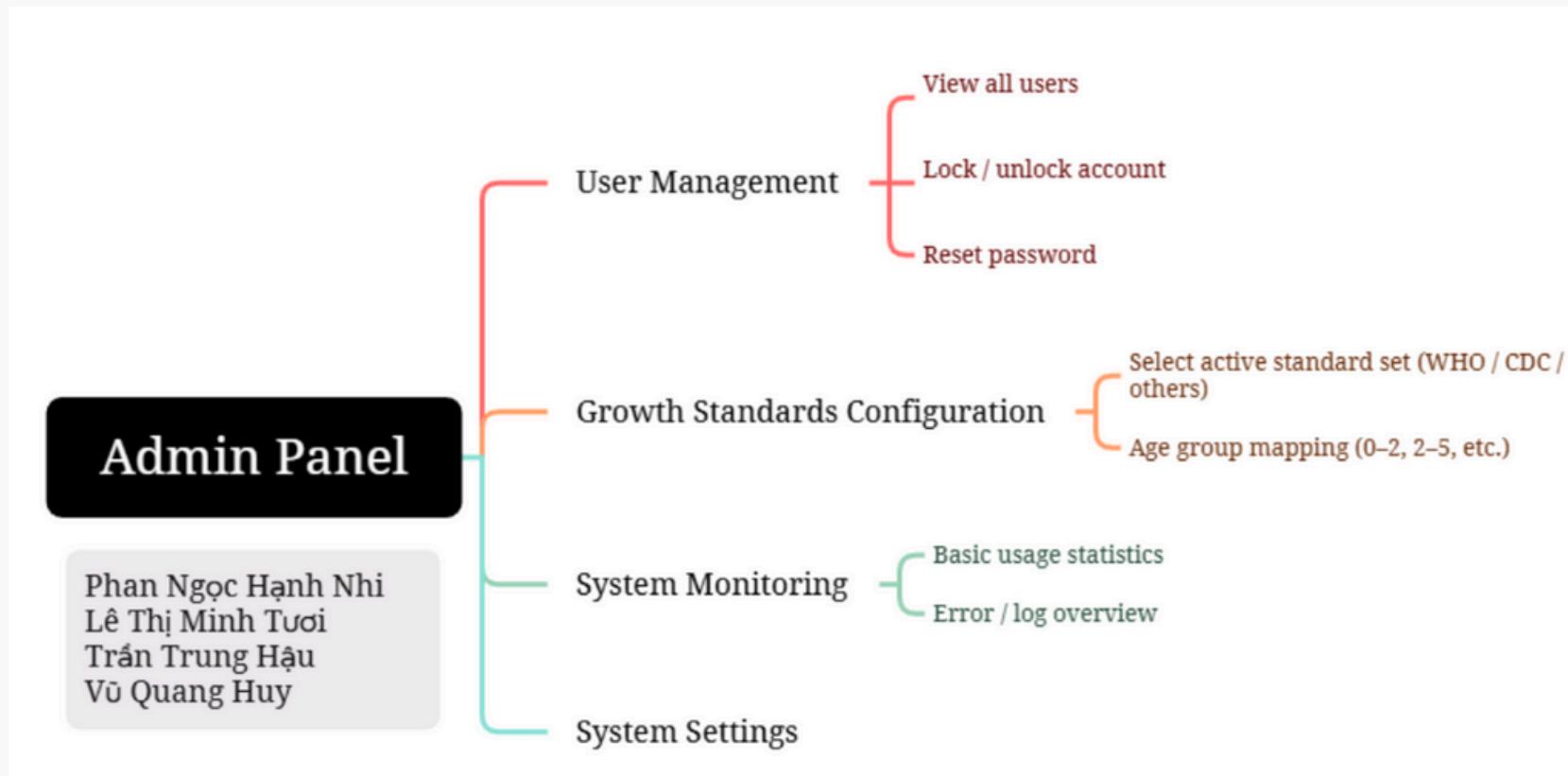
- Login or access via shared link / account.
- View shared child profiles:
- Basic information
- Growth charts (read-only)
- Measurement history (read-only)
- Download reports for consultation.

Diagram overview System Admin Panel – System Management

Admin Panel

- **User Management**
  - View all users
  - Lock / unlock account
  - Reset password
- **Growth Standards Configuration**
  - Select active standard set (WHO / CDC / others)
  - Age group mapping (0–2, 2–5, etc.)
- **System Monitoring**
  - Basic usage statistics
  - Error / log overview
- **System Settings**

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- **User Management:** view users, lock/unlock, reset password.
- **Growth Standards Configuration: select WHO / CDC set, age group mapping.**
- **System Monitoring: usage statistics, error/log overview.**
- **System Settings (general configuration).**

3. System Boundary

Actor	Description	Goals	Key interactions
Parent	Primary guardian who owns and manages a child's profile	Track child's growth, share reports	Register/login, manage child profiles, input measurements, view charts, export reports, receive reminders
Caregiver	Authorized helper allowed by Parent to assist with monitoring	Support measurement input and day-to-day tracking	View child info, enter measurements, receive reminders
Doctor	Medical professional reviewing growth data	Evaluate child's development	View shared reports and charts (read-only)
Notification Service	Service used to send reminders and alerts	Deliver reminders to users	Receives notification data and sends messages
Admin	System operator responsible for system integrity	Maintain system, manage users, ensure reliability	Manage user accounts, configure WHO/CDC standards, monitor logs, configure system settings

4. Use cases

User Management & Access Control

1. **Register Account:** Users create a new account using a full name, email and password to access the system
2. **Log in:** Users log in with their registered credentials to access features based on their role
3. **Log out:** Users log out of the system to protect their account and data
4. **Manage User Profile:** Users update personal information such as name, email or profile photo
5. **Manage User Roles & Authorization:** The system assigns and enforces permissions for Parent, Caregiver, Doctor and Admin roles

4. *Use cases*

Child Profile Management

6. **Create Child Profile:** Parents create a child profile with basic information such as name, gender, birthdate and preterm status

7. **View Child Profile:** Parents and authorized caregivers view detailed information and growth history for each child

8. **Update Child Profile:** Parents modify a child's profile when information changes

9. **Deactivate Child Profile:** Parents deactivate a child's profile that is no longer needed

4. Use cases

Growth Measurement Recording

10. **Add Growth Measurement:** Parents or authorized caregivers enter new growth data such as weight, height and head circumference

11. **Edit Measurement:** Users update incorrect or outdated measurement entries

12. **Delete Measurement:** Users delete a measurement record that should no longer be stored

13. **Auto Caculate BMI & Measurement Age:** The system automatically calculates BMI and child's age (chronological or corrected) at the time of measurement

4. Use cases

Growth Chart Analysis & Visualization

14. **View Growth Charts:** Users view growth charts for weight, height or BMI over time

15. **Display Percentile Position:** The system shows the child's percentile position and whether the growth is below, within or above normal ranges

16. **Select Growth Standard:** The system (or Admin) selects which growth reference (WHO/CDC) to use for percentiles

4. Use cases

Reminders & Notification

17. **Configure Measurement Reminders:** Parents set periodic reminder schedules (e.g monthly, quarterly) for each child

18. **Receive Measurement Notifications:** The system sends notifications when it is time to record new measurements

4. Use cases

Report Export & Sharing

19. **Generate Growth Report:** Users generate a growth report (PDF, CSV, chart images) for a selected time range

20. **Download Report:** Users download generated reports onto their device

21. **Share Report:** Users share the child's growth report with doctors or caregivers via email or secure link
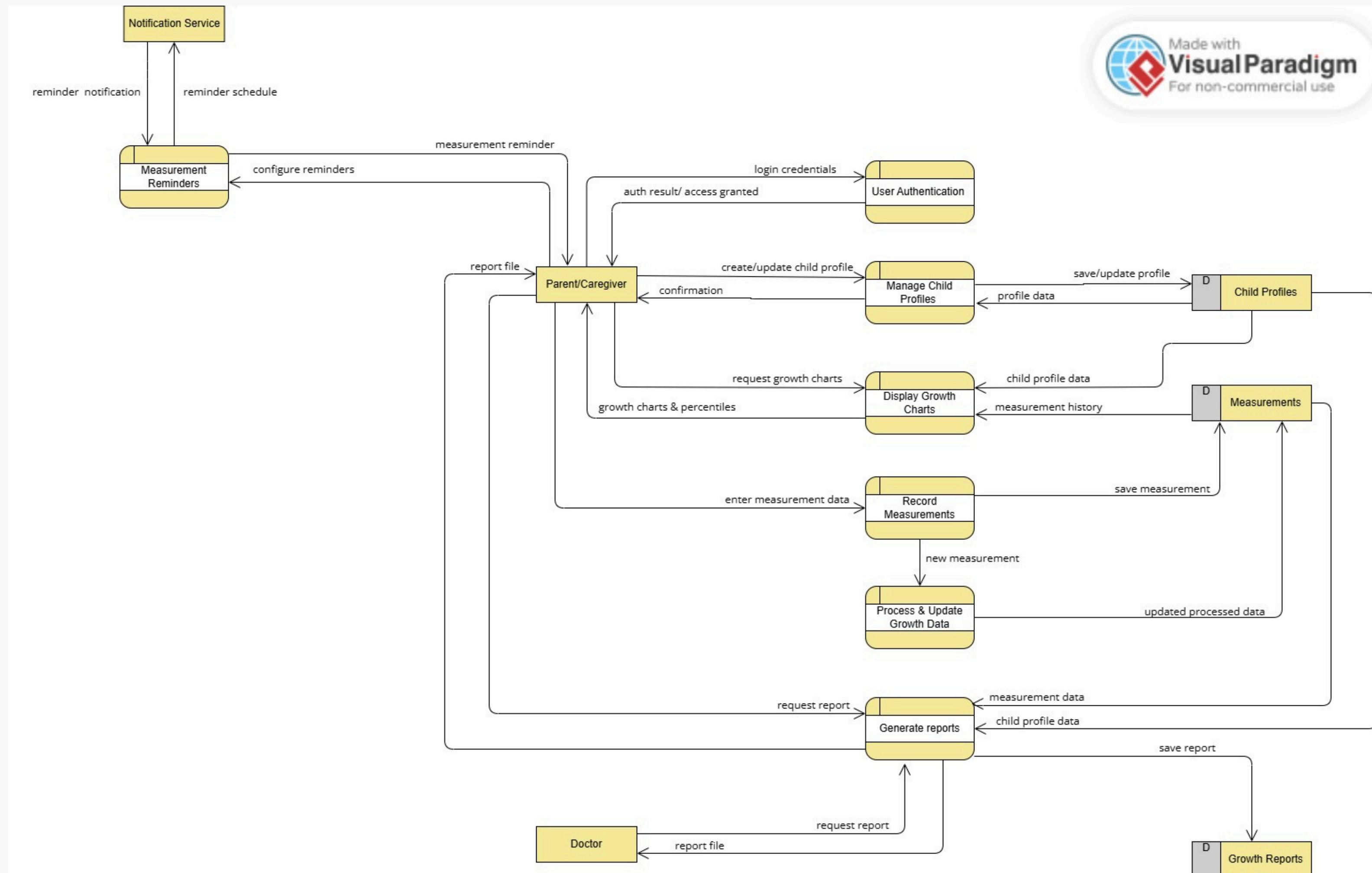
4. Use cases

System Administration

22. **Manage User Accounts:** Admins lock/unlock accounts and view user activity

23. **Configure Growth Standards:** Admins configure or update the growth reference standards used by the system

24. **Monitor System Operations:** Admins review logs, system usage statistics and overall system status
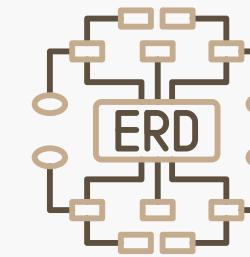
7. Graph
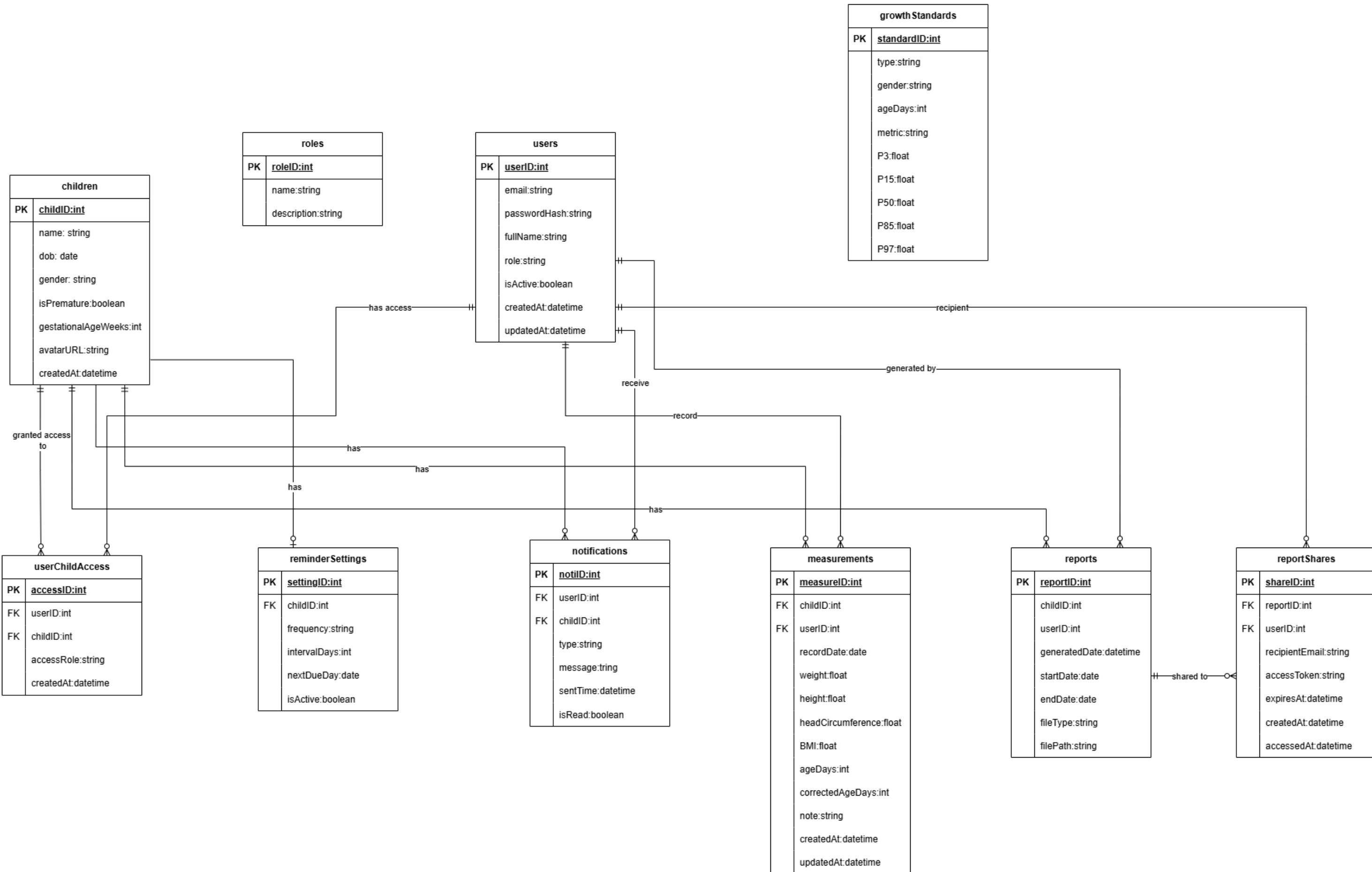
DFD Level-0

7. Graph

Entity-Relationship Diagram (ERD)
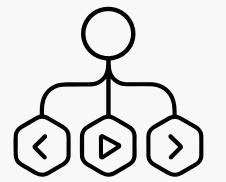
7. Graph

ERD Highlights:

- Users ↔ Children is a Many-to-Many relationship through UserChildAccess
- Each child has many measurements, reports, and notifications
- Measurements store weight, height, BMI, etc., linked to the child and the user who recorded them
- ReminderSettings is optional (0–1 relationship)
- Roles & GrowthStandards are standalone reference tables

7. Graph

Activity Diagram: Measurement & Growth Chart Flow
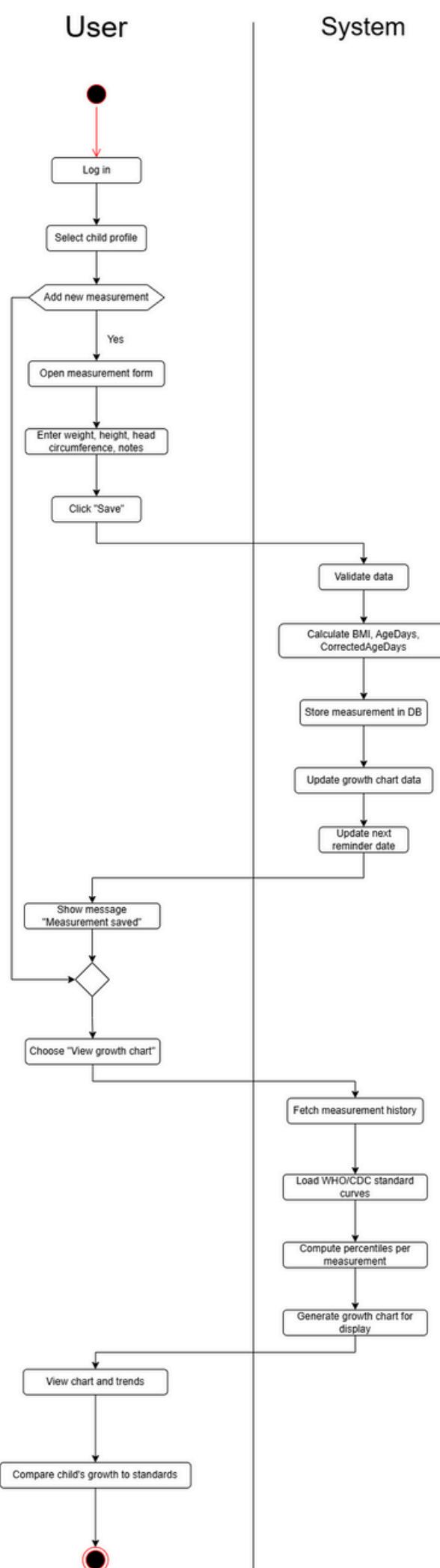
How the Process work:

User actions:

- Select child
- Enter new measurement
- View growth chart
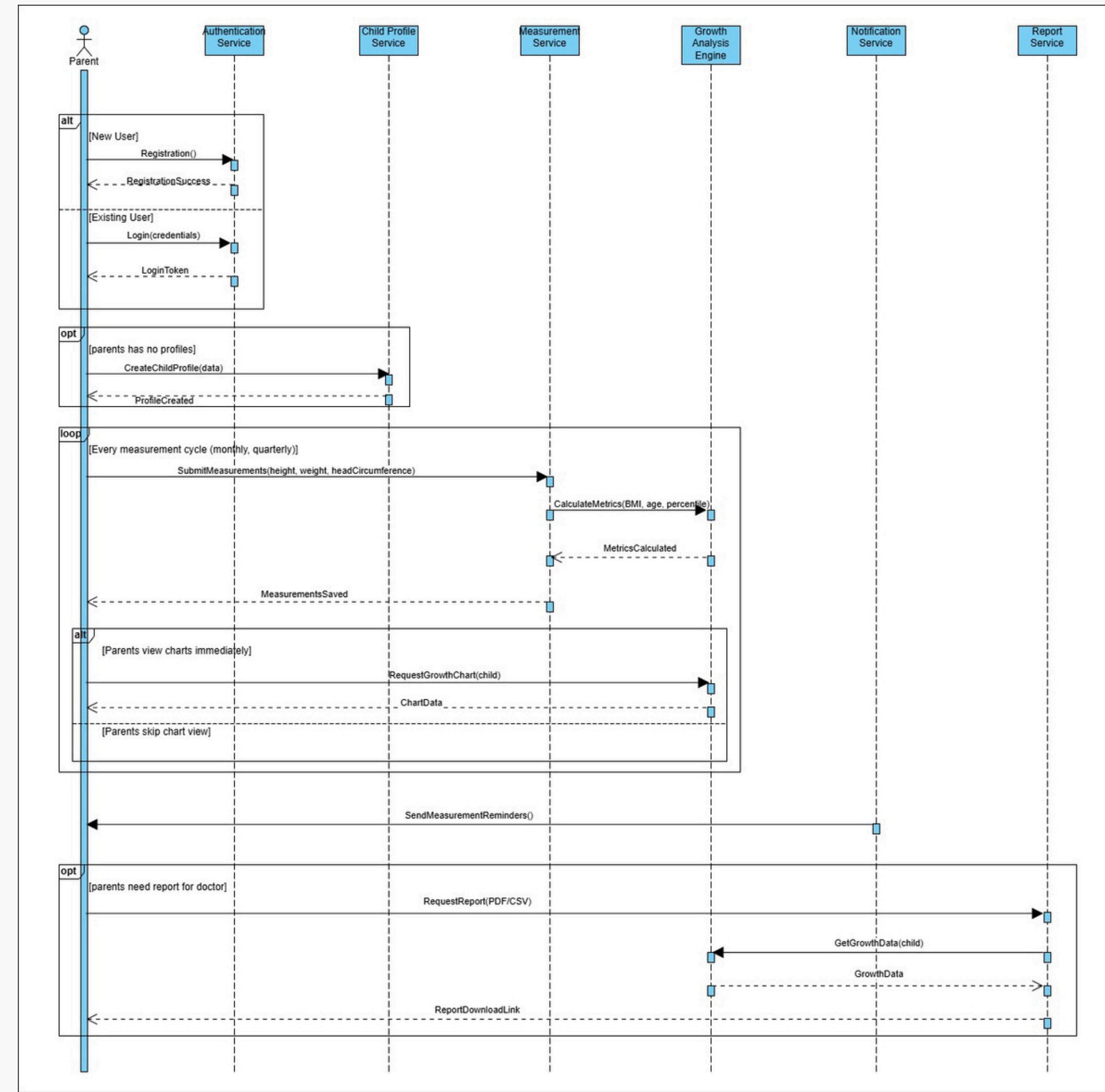
System actions:

- Validate & save data
- Calculate BMI & percentile
- Load WHO/CDC standards
- Render chart

7. Graph

Sequence Diagram

8. Wireframe

Child Growth Tracker
Welcome, huy

Children   + Add

Pham Viet Anh
5y 11m

Pham Viet Anh   Edit   Delete
5y 11m • Male

Date of Birth   Latest Weight   Latest Height   Latest BMI
1/1/2020   37 kg   92 cm   43.7

📅 Measurements   ↗ Growth Charts   Reports   Reminders

Measurements History   + Add Measurement
Track weight, height, and other metrics over time

Date	Age (months)	Weight (kg)	Height (cm)	Head Circ. (cm)	BMI	Notes	Actions
3/1/2020	2m	37	92	-	43.7	-	🗑
2/1/2020	1m	35	90	-	43.2	-	🗑