Software Requirements Specification (SRS)

for

SmartHealthVault

AI-Based Personal Medical Record App

Version 2.0

(Extended with Global, AI, and Insurance Features)

HiCore Software Technologies Pvt. Ltd.

Jennica B - Author

Contents

1. Introduction

1.1 Purpose

This app helps individuals manage their lifetime health records securely, integrate with doctors, insurance, wearables, and receive AI-based health suggestions.

1.2 Scope

The SmartHealthVault is designed to serve as a comprehensive digital health companion for individuals and families. It allows users to securely store, upload, view and share personal and family health records, including documents, prescriptions, test reports, and medical summaries.

The app provides AI-powered health insights, personalized suggestions, and predictive risk assessments to help users make informed decisions about their well-being.

Additionally, it enables seamless connectivity with doctors, insurers, pharmacies, and diagnostic labs for end-to-end healthcare management. SmartHealthVault is built to function globally, offering multilingual support, integration with travel-related features, and interoperability with international health data standards.

1.3 Target Audience

- Individuals
- Families
- Doctors
- Insurance Companies
- Global Travelers

1.4 Definitions

Abbreviation	Full Form
EMR	Electronic Medical Record
EHR	Electronic Health Record
FHIR	Fast Healthcare Interoperability Resources

AI	Artificial Intelligence
UI	User Interface
OTP	One-Time Password
TOTP	Time-Based One-Time Password
2FA	Two-Factor Authentication
PDF	Portable Document Format
OCR	Optical Character Recognition
NLP	Natural Language Processing
API	Application Programming Interface
HIPAA	Health Insurance Portability and Accountability Act
GDPR	General Data Protection Regulation
NFC	Near Field Communication
SMS	Short Message Service
NDHM	National Digital Health Mission (India)
ABHA	Ayushman Bharat Health Account (India)
JSON	JavaScript Object Notation
XML	Extensible Markup Language
AWS	Amazon Web Services
SLA	Service Level Agreement

2. Overall Description

2.1 Product Perspective

A cross-platform mobile application with optional web portal. It can integrate with healthcare APIs, cloud services, and AI models.

2.2 User Classes

- Patient / Individual User
- Family Head / Parent
- Doctors
- Insurers
- Admin

2.3 Operating Environment

- Mobile (Android/iOS)
- Optional Web Portal (for Admins, Doctors)

2.4 Constraints

- GDPR, HIPAA Compliance
- Secure, Encrypted Medical Storage
- Offline Access with Sync

---

3. Functional Requirements

3.1 User Registration and Profiles

3.1.1 The system shall allow users to create an account and log in using any of the following methods:
- Mobile number with one-time password (OTP) verification
- Email and password combination (email verification is optional)
- Social login using supported platforms: Google, Apple, or Facebook

3.1.2 To increase security, two-factor authentication (2FA) shall be supported through:
- OTP sent via SMS or email
- Time-based passcodes generated by authenticator apps such as Google Authenticator or Authy

3.2   User Profile Creation

3.2.1   After completing registration, each user shall be able to create a basic profile by entering the following details:

- o   Full Name – (as shown in official documents)
- o   Date of Birth
- o   Gender
- o   Blood Group
- o   Phone Number
- o   Email Address
- o   Residential address (used to suggest nearby services such as local labs and doctors)
- o   Emergency Contact
- o   Profile Picture (Optional)

3.2.2   Users shall be able to add and manage profiles for multiple family members or dependents under their main account. Each profile may include:

- o   Family Role (Child, Spouse, Parent, etc.)
- o   Relationship verification (optional)
- o   Basic details: age, gender, blood group, known medical conditions
- o   A separate section to store and track medical records for each family member
- o   The ability to set individual reminders and alerts for each member

3.3   Profile Management Features

3.3.1   Users shall have the following options to manage their profile:

- o   Edit or update personal information at any time
- o   Turn biometric login on or off (Face ID or fingerprint)
- o   View a personal health summary directly from the dashboard
- o   Set preferred language and accessibility options for the app interface
- o   Permanently delete their account if requested (as required by GDPR guidelines)

3.4   Roles and Permissions

3.4.1   The system shall support different access levels based on user roles.

3.4.1.1   Primary User / Account Holder

- o   Has full access to all medical records, user settings, and billing information
- o   Can add and manage family member profiles
- o   Role-based access control is applied to ensure secure separation between users

3.4.1.2   Dependent / Family Members

- o   Have limited access to the system unless the primary user grants additional permissions
- o   Can create health reports and share them with doctors if allowed by the account holder

3.5 Security and Privacy Settings

3.5.1 Users shall have detailed control over their privacy and data-sharing settings. The following options shall be available:

- o Choose which health records can be shared, and select who is allowed to view them
- o Manage emergency access settings, such as enabling access through QR code or NFC card
- o Set preferences for notifications and control when and how personal data is shared with others

3.6 Device & Session Management

3.6.1 Users shall be able to manage the devices that are connected to their account. The following features shall be included:

3.6.1.1 View Active Devices

The system will display a list of all devices where the user is currently logged in. Information such as device type, location (approximate), and login time will be shown.

- o Remote Logout

  Users can manually log out of specific devices or choose to log out from all devices at once. This feature is useful when a user loses access to a device or suspects unauthorized use.

- o **Suspicious Login Alerts**

  If a login attempt is detected from an unknown or high-risk location, the system will send an alert to the user via push notification and/or email. The alert will include device and location details and suggest immediate action.

3.7 Medical Record Upload & View

3.7.1 Supported File Types for Upload

Users shall be able to upload different types of medical documents into the system. The following formats are supported:

- o PDF files**,** including both single-page and multi-page documents
- o Image files**,** such as JPG, PNG, HEIC, and other standard image formats
- o DICOM files **(**Digital Imaging and Communications in Medicine), used for medical imaging like X-rays or scans
- o Scanned documents captured using the in-app camera scanner

3.7.2 Multi-Source Record Ingestion

Users shall be able to import medical documents from multiple sources. The supported input methods include:

- o Selecting files directly from the device's photo gallery or file manager
- o Connecting and uploading from cloud storage services such as Google Drive, iCloud, Dropbox, or OneDrive
- o Importing files using shared links received from hospitals or diagnostic labs
- o Uploading attachments from emails through integrated email services

These options help users gather and store all their medical records in one secure location.

3.8   Smart Categorization & Organization

3.8.1   The system shall automatically classify uploaded medical documents into predefined categories, based on content and file type. The supported categories include:

- o   Prescription
- o   Diagnosis
- o   Lab reports
- o   Discharge summary
- o   Imaging files (such as X-rays, MRI scans, and CT scans)
- o   Vaccination and immunization records
- o   Surgical reports
- o   Bills and invoices

Users shall also have the option to create custom categories and assign labels based on their own preferences. This helps in organizing records for quick access and easier tracking.

3.9   AI-Powered Label Extraction (OCR & NLP)

3.9.1   When a medical document is uploaded, the system shall use Optical Character Recognition (OCR) and Natural Language Processing (NLP) to analyze the content. The AI engine will perform the following tasks:

- o   Extract important information such as:

    - ▪   Doctor's name

    - ▪   Date of visit

    - ▪   Hospital or clinic name

    - ▪   Test names and their results

- o   Identify and extract prescribed medications from the document
- o   Detect important medical terms and risk indicators, such as high blood sugar or elevated blood pressure
- o   *(Future Feature)* Automatically tag key metadata to improve search, filtering, and categorization of records

These AI-powered features are designed to reduce manual input and help users organize their medical data more efficiently.

3.10 Medical History Timeline View (Expand)

3.10.1 The system shall generate a visual timeline for each user profile. This timeline will present the user's medical history in a clear, chronological format. Key features include:

- o Display of medical events in order, including doctor visits, lab tests, diagnoses, treatments, and prescriptions
- o Filters to help users narrow down the timeline by:

    - ▪ Category (e.g., diagnosis, lab reports)

    - ▪ Date range

    - ▪ Specific keywords

- o The ability to highlight major health events or "anchor points," such as surgeries, hospitalizations, or critical diagnoses

This timeline helps users and doctors quickly understand medical progression and spot patterns in treatment history.

3.11 Enhanced Viewing Features

3.11.1 The application shall include a built-in viewer for PDFs and images, allowing users to interact with their medical documents without leaving the app. The viewer will support the following features:

- o Zoom and rotate functions for better readability
- o The ability to highlight important areas on a document
- o Users can add notes or sticky tags to annotate reports with personal reminders or doctor comments

3.11.2 Accessibility Highlight:

- o A speech-to-text summary feature will be available to read out the contents of medical reports. This is designed to support users with visual impairments or reading difficulties.

These features make the app more user-friendly and inclusive for all types of users.

3.12 Search & Filter Engine

3.12.1 The system shall include a smart search and filtering engine to help users quickly locate medical records. Users will be able to search by:

- o Specific keywords, such as disease names (e.g., "diabetes"), test types (e.g., "MRI"), or institution names (e.g., "Apollo")
- o Filters such as:

- ▪ Date range

- ▪ Doctor's name

- ▪ Hospital or clinic name

- ▪ Custom tags assigned to documents

3.12.2 Future Enhancement:
AI-based suggestions will help users apply advanced filters, such as:
  - o Records with abnormal results
  - o Reports related to pending or follow-up tests

These tools aim to make navigation and information retrieval easier as the record database grows.

3.13 Versioning & Edit History

3.13.1 The system shall support version control for medical documents. Key features include:
  - o Uploading new or updated versions of an existing document
  - o Viewing and restoring previous versions if needed
  - o Automatic timestamping and user identification for each upload or change

This ensures a complete audit trail and prevents data loss due to accidental overwrites.

3.14 Privacy & Sharing Controls

3.14.1 Each medical document shall have its own privacy and sharing settings. Users can:
  - o Share documents with a doctor or insurance agent for a limited period or in read-only mode
  - o Generate secure, view-only links that can be shared externally
  - o Export selected documents as QR codes for fast access in emergency situations

These settings give users full control over who can access their health data and for how long.

3.15 Future - Interoperability Support

3.15.1 To ensure compatibility with external systems, the app shall support the following in future updates:
  - o Extract data from hospital systems using FHIR-compliant formats
  - o Export structured health records in:

    - ▪ PDF summary format

- JSON or XML (for EHR system integration)

- Formats compatible with national health platforms such as NDHM (India) or NHS (UK)

This will allow for smooth data transfer across different platforms and institutions.

3.16   Backup & Sync

3.16.1 The application shall provide secure options for data backup and synchronization. Features include:

- Real-time or scheduled cloud syncing of documents
- Automatic upload of new medical images or files from the device gallery
- Encrypted local backup and display of sync status for user awareness

These features help ensure that health records are never lost and stay accessible across devices.

3.17   Reminders & Notifications

3.17.1 Users can set detailed medication schedules with the following options:

- Name of the medicine
- Dosage and form (e.g., 500 mg, tablet, syrup, or injection)
- Frequency (once daily, twice daily, or custom intervals)
- Duration (start and end dates)
- Time of day and optional repeat settings

3.17.2 Planned Features:

- Add an image of the pill or strip for visual reference
- Customize alert sound or vibration pattern

3.17.3 Track medication intake (missed vs. taken doses)

3.18   Appointment Notifications

3.18.1 Users will receive automatic reminders for:

- Doctor visits (in-person or online consultations)
- Scheduled lab tests
- Insurance follow-ups or callback appointments

3.18.2 Additional features:

- Sync with third-party calendar apps like Google Calendar or Apple Calendar
- Alerts sent before appointments (e.g., 1 hour or 1 day in advance)

3.19   Custom Health Reminders

3.19.1 Users can create personalized health-related reminders, including:

- o   Drinking water at regular intervals
- o   Checking vitals such as blood pressure or blood sugar
- o   Mental health check-ins or journaling
- o   Baby vaccination dates or pregnancy care milestones
- o   Exercise or wellness tasks

3.19.2 Recurring, one-time, or weekly scheduling will be supported.

3.20   Voice & Accessibility Features

3.20.1 Accessibility is prioritized through the following:

- o   Set reminders using voice commands
- o   Create custom voice alerts (recorded or text-to-speech)
- o   Audio playback of reminders for users with visual impairment
- o   Vibrating or haptic alerts for hearing-impaired users

3.21   Notification Delivery Methods

3.21.1 Notifications will be delivered through:

- o   Push notifications with direct links to related sections
- o   SMS or email alerts (optional, especially useful for dependents)
- o   In-app notification center categorized by type and urgency

3.22   Family & Dependent Reminders

3.22.1 Features for multi-user households include:

- o   Set and manage reminders for dependents
- o   Choose whether reminders are visible to the dependent
- o   Share reminder alerts with caregivers or family members through linked accounts

3.23   Snooze, Dismiss & Log

3.23.1 Users can manage alerts as follows:

- o   Snooze or reschedule any reminder
- o   Dismiss with a reason (e.g., "already taken" or "medication not available")
- o   Maintain a log or journal of completed or missed actions for health tracking

3.24   Emergency Alerts & Escalation

3.24.1 For critical health events, such as missed vital medication or abnormal readings:

- o   The app will trigger a follow-up alert
- o   Caregivers may be notified if the issue remains unresolved

3.24.2 Future Feature:

- Alerts will automatically escalate in urgency if the user does not respond

3.25 Settings & Customizations

3.25.1 Users can globally customize notification settings:

- Alert tones, vibration settings, and Do Not Disturb hours
- Create custom channels (e.g., general health, family reminders, AI health tips)
- Enable sync across devices such as phones and tablets

3.26 Future - Smart AI-Driven Reminders

3.26.1 AI-based reminders may assist users by:

- Suggesting follow-ups after lab reports or prescriptions are uploaded
- Recommending regular checkups based on age, gender, or medical history
- Notifying when a medicine supply is likely to run out
- Prompting the user if medications appear to be missed

3.27 AI Health Risk Prediction *

3.27.1 The system shall use machine learning and statistical models to estimate the likelihood of developing specific health conditions. These include:

- Chronic diseases such as diabetes, high blood pressure, heart disease, and obesity
- Lifestyle-related conditions like sleep apnea, fatty liver, and stress-related issues
- Mental health risks such as anxiety or depression (if enabled in Section 3.14)
- Women's health issues such as PCOS and pregnancy-related complications (based on consent)

3.27.2 Models trained on anonymized datasets, tuned for:

- Age group
- Gender
- Ethnic and regional health patterns (if data is available)

3.28 Multi-Factor Analysis

3.28.1 The AI will calculate health risk scores using a combination of the following factors:

- Medical records (uploaded manually or retrieved from connected hospital systems via FHIR)
- Vitals data from wearables or manual inputs
- Lab results, either OCR-extracted or entered by the user
- Lifestyle data, including sleep patterns, physical activity, mood logs, and stress levels
- Family medical history or genetic risks (optional)

3.29   Personalized Health Dashboard

3.29.1 Each user will be able to view their risk profile through a visual dashboard, which shows:

- The risk level for each health condition (Low, Medium, or High)
- A confidence score indicating how accurate the prediction is (e.g., 87%)
- A trend line showing whether their health risk is increasing or decreasing
- Recent data that contributed to a change (e.g., a high cholesterol reading)

3.30   Future - Preventive Health Suggestions

3.30.1 The system may offer AI-generated suggestions to improve health and lower risks, such as:

- Personalized recommendations for diet, exercise, and sleep
- Suggested lab tests (e.g., HbA1c or ECG)
- Tips to change specific behaviors (e.g., reduce caffeine, walk daily)
- Direct links to in-app actions:

  - Book a test

  - Consult a doctor

  - Set a health reminder

3.31   Future - Explainable AI (XAI)

3.31.1 To help users understand how predictions are made, the system will display:

- An explanation of why a particular result was shown
- The records, vitals, or trends that influenced the prediction
- Notes about model limitations and confidence level

Tooltips and disclaimers will be provided to support informed decision-making.

3.32   Risk Alerts & Notifications

3.32.1 The app will notify users in the following cases:

- A major increase or decrease in health risk
- Missed actions that could affect health (e.g., no test done, skipped reminders)
- Medical data suggesting new risk (e.g., an abnormal ECG result)

3.33   Data Privacy & Ethical Compliance

3.33.1 All AI features will follow strict privacy and ethical standards:

- Predictions are only made after the user gives consent
- Processing happens locally on the device when possible; otherwise, secure cloud-based AI is used
- Models are tested for fairness and bias
- Users can opt out at any time and delete their AI history

3.34 Future - Family Risk Insights

3.34.1 If the user has added family members:

- The system may detect inherited health patterns (e.g., family history of diabetes)
- The main account holder may receive alerts about risks affecting dependents
- Consent-based notifications to guardians or caregivers will be supported in future versions

3.35 Integration with Other Modules

3.35.1 The health risk engine shall connect with:

- Reminder system to suggest proactive actions (e.g., weekly BP checks)
- Insurance module to recommend relevant health coverage
- Telemedicine module for connecting users to specialists based on predicted risks

3.36 Continuous Learning and Model Updates

3.36.1 Backend models continuously improved with:

- Anonymized usage data (opt-in)
- Feedback loop (users can mark suggestions as useful/irrelevant)
- Periodic retraining using latest medical research and user trends

3.37 Doctor Connect & Telemedicine

3.37.1 Users shall be able to search for doctors using the following filters:

- Medical specialty (e.g., cardiologist, pediatrician, dermatologist)
- Location (based on GPS or manual selection)
- Language spoken by the doctor
- Ratings and user reviews
- Appointment availability (today, this weekend, or within the next few days)

3.37.2 Additional filters may include:

- Doctors who support video consultations
- Doctors who accept insurance
- Doctor's experience, gender, and consultation fees

3.38 Appointment Scheduling

3.38.1 Users can book either virtual or in-person consultations with features such as:

- Selection of date, time slot, and consultation mode
- Real-time availability updates from the doctor's calendar
- Smart support for different time zones for global users
- Rescheduling and cancellation options
- Waitlisting if a preferred time slot is unavailable

Reminders: Notifications will be sent via app, SMS, or email—24 hours and 1 hour before the scheduled appointment.

3.39 Telemedicine & Video Consultations

Video and audio consultations will be enabled using secure and privacy-compliant technology such as WebRTC or HIPAA-approved SDKs. Features include:

3.39.1 Before the consultation:
- Users can enter the reason for the visit and upload documents
- *(Future Feature)* Automatic health summary generation using AI

3.39.2 During the consultation:
- Two-way file sharing (e.g., prescriptions, medical reports)
- Real-time note-taking by both user and doctor
- *(Future Feature)* Support for screen sharing or whiteboarding

3.40 Live Record Sharing & Interaction

3.40.1 While consulting, users can:
- Share past medical reports, such as lab results or prescriptions
- View documents together on a shared interface
- Highlight important medical events (including AI-suggested highlights)

3.40.2 After the consultation:
- A consultation summary is auto-generated
- Any prescriptions from the doctor are saved to the user's record
- Users can provide ratings and feedback on the consultation

3.41 Doctor Profile & Dashboard

3.41.1 Each doctor will have a dedicated profile displaying:
- Credentials and medical certifications
- Specialization and years of experience
- Languages spoken
- Clinic address for hybrid (in-person + online) consultations
- Virtual appointment timings and availability slots

3.42 Secure Communication & Follow-Ups

3.42.1 The app shall support encrypted messaging for:
- Pre-consult questions
- Post-consult follow-up messages within a specified period

Doctors and users can exchange documents via chat. Follow-up bookings can be offered at a discounted rate if applicable.

3.43 Doctor Verification & Quality Control

3.43.1 All listed doctors will undergo a verification process, including:
- o Validation of government-issued registration numbers
- o Upload of qualification documents
- o Manual review and approval by administrators

Doctors with telemedicine certification will receive a special badge. Users can report concerns or leave reviews for quality monitoring.

3.44 Consent & Compliance

3.44.1 Before any virtual consultation begins:
- o Explicit user consent is required
- o Video/audio calls and chat logs are encrypted and may be stored if legally permitted
- o The platform follows data protection laws such as HIPAA, GDPR, and Indian Telemedicine Guidelines

In urgent medical situations, doctors can escalate the case for emergency care, based on the user's consent and safety protocols.

3.45 Integration with Other Modules

3.45.1 Appointments will integrate with:
- o **Reminders module** to send timely alerts
- o **Medical Records** to automatically suggest related documents for the doctor
- o **Insurance Module** to verify coverage for the consultation

Consultations can also be added to the user's calendar, and follow-up care plans may be generated.

3.46 Doctor Panel (Web Portal)

3.46.1 Doctors will have access to a dedicated web dashboard where they can:
- o View upcoming bookings and patient details (with user consent)
- o Access shared medical history and records
- o Upload prescriptions and lab reports
- o Set available time slots and consultation fees
- o Track their earnings and appointments

3.47 Insurance Plan Discovery

3.47.1 Users shall be able to explore a curated list of insurance plans that are personalized based on:
- o User profile information such as age, gender, and location

- Pre-existing medical conditions (e.g., diabetes, high blood pressure)
- Life stage or category (student, senior citizen, family head, pregnant user)
- Preferred insurance brands and networks (e.g., Max Bupa, HDFC Ergo, Star Health)

3.47.2 Plans will be grouped into easy-to-understand categories:

- Individual and family health insurance
- Maternity plans
- Senior citizen coverage
- Critical illness or top-up plans
- OPD coverage and telemedicine-inclusive policies

3.48 AI-Powered Recommendation Engine

3.48.1 An intelligent AI system will suggest the best-fit insurance plans based on:

- Medical records uploaded by the user
- Health risk predictions from the AI engine (e.g., heart-related risk prompts heart-specific cover)
- Family profiles (e.g., children added → recommend pediatric cover)
- History of past claims, if available

3.48.2 The system will highlight:

- Balance between premium cost and benefits
- Estimated likelihood of claim usage based on current health
- Top 3 recommended plans ("SmartMatch") with clear reasoning

3.49 Plan Comparison Tool

3.49.1 Users can compare multiple plans side-by-side using key parameters:

- Monthly/annual premium cost
- Total coverage amount (sum insured)
- Included and excluded services
- Access to network hospitals for cashless claims
- Claim settlement ratios and customer feedback

A custom "AI Match Score" will be shown to help guide the final decision.

3.50 Easy Call-Back / Contact Options

3.50.1 Users shall be able to connect with insurers or advisors through:

- Scheduling a callback at a convenient time
- Booking an appointment with a certified insurance advisor
- In-app live chat for questions or clarifications

Contact requests will be routed based on the selected plan or interest area.

3.51 Instant Application & Onboarding

3.51.1 The app will allow users to apply for a selected insurance plan through a simple, guided flow:

- o Upload KYC or medical documents as needed
- o Sign documents electronically (via Aadhaar/OTP)
- o Pay premiums using a secure payment gateway

Users can track application status in real time (e.g., "In Progress," "Approved," "Issued").

3.52 Smart Policy Locker & Reminders

3.52.1 Once a policy is issued, it will be stored securely in an encrypted policy locker. Users can view:

- o Policy documents, ID card, and coverage details
- o Upcoming renewal dates with automatic alerts
- o Claim filing history and settlement progress

The system will also send reminders for renewals or top-up suggestions based on user activity.

3.53 Integration with Insurers

3.53.1 The platform will connect with third-party insurance providers and aggregators such as PolicyBazaar, Plum, and Ditto using APIs. Features include:

- o Instant quote generation
- o Real-time updates on application and onboarding steps
- o Embedding insurer-specific workflows within the app (white-labeled interface)

3.54 Doctor + Insurance Collaboration

3.54.1 During a doctor consultation, the system may:

- o Show whether a selected insurance plan covers the treatment or test
- o Notify users about claim eligibility or required documents
- o Suggest partner hospitals and highlight pre-authorization requirements if applicable

3.55 Claims Management Module (Future Enhancement)

3.55.1 Future versions of the app will allow users to manage insurance claims, including:

- o Filing claims directly in the app (e.g., by uploading invoices or discharge summaries)
- o Tracking the status and expected settlement time
- o Reviewing past claims and settlement records

3.56 Privacy & Compliance

3.56.1 All insurance-related data will be managed according to strict privacy standards:

- No health data will be shared with insurers without explicit user permission
- Full compliance with IRDAI regulations in India
- Secure handling of sensitive financial and medical data in line with GDPR and HIPAA
- Access to insurance features will be governed by user-defined permissions

3.57 Supported Health Platforms & Devices

3.57.1 The app shall integrate with the following popular health tracking systems:

- Apple Health (iOS)
- Google Fit (Android)
- Fitbit
- Garmin Connect
- Samsung Health
- Other Bluetooth-enabled devices such as Withings, Mi Band, and Realme Band

The system uses a modular integration structure, making it easy to support additional platforms in future updates.

3.58 Synced Health Data Types

3.58.1 The app can collect and sync the following types of health data either continuously or at regular intervals:

- Heart rate (resting, average, high/low)
- Blood pressure (systolic and diastolic)
- Blood oxygen saturation (SpO2)
- Blood glucose levels (if supported by the device)
- ECG readings (e.g., from Fitbit Sense, Apple Watch Series 4 and above)
- Respiration rate
- Body temperature (if available)
- Sleep patterns (REM, light sleep, deep sleep)
- Fitness data: step count, walking distance, calories burned
- Menstrual cycle logs (from platforms like Apple Health or Fitbit)
- Body weight and BMI (from smart scales)
- Mood or stress levels (if device supports it)

3.59 Real-Time & Background Sync Options

3.59.1 Users can choose how their health data is synced:

- Manual sync initiated by the user
- Scheduled sync (e.g., every 6 hours)
- Real-time sync (requires user permission)

All background sync processes are optimized to reduce battery usage.

3.60   Unified Vitals Dashboard

3.60.1 All synced data will be displayed in a centralized, easy-to-read health dashboard. Features include:

- Charts showing trends over time (daily, weekly, or monthly)
- AI-generated insights and alerts for unusual patterns
- Comparison with lab results (if available in the user's medical record)

3.61   Personalized Health Insights from Device Data

3.61.1 The system will use AI to analyze wearable data in combination with:

- The user's medical records
- Health risk scores from the AI engine
- Recorded medication or activity patterns

3.61.2 Examples:

- "Resting heart rate has increased by 15% in the past 5 days. Consider contacting your doctor."
- "You have slept less than 5 hours for 4 consecutive days. Stress levels may be elevated."

3.62   Alert Triggers & Emergency Flags

3.62.1 Users can define alert thresholds for important health indicators, including:

- High or low heart rate
- Abnormal ECG results (e.g., signs of atrial fibrillation)
- Low oxygen saturation (SpO2 < 92%)

3.62.2 In critical cases:

- Alerts are sent to the user and their emergency contact (if enabled)
- Optional notification to a linked doctor or suggestion to start a tele-consultation

3.63   Future - Family Device Sync

3.63.1 Planned features will allow:

- Parents or caregivers to sync wearables used by children or elderly family members
- Custom sync and notification settings per family profile
- Cross-comparison of health data among family members

3.64   Privacy, Permissions & Compliance

3.64.1 The app will offer full privacy controls and follow strict compliance standards:

- Users can choose exactly which data types to share with the app
- Permission can be revoked at any time

3.64.2 Data security:

- All health data is encrypted during transmission and storage
- No data is shared with third parties without explicit user consent

3.64.3 The system is fully compliant with:

- HIPAA, GDPR
- Apple HealthKit and Google Fit privacy policies

3.65 Data Export & Doctor Integration

Users can export their health data in the following formats:

3.65.1 PDF reports for personal use

- Structured FHIR/JSON files for sharing with electronic health record (EHR) systems

3.65.2 They can also:

- Share real-time health data during a medical consultation
- *(Future Feature)* Automatically sync selected data with the insurance module for risk evaluation

3.66 Future Enhancements

3.66.1 Planned improvements to this module include:

- AI-generated daily or weekly health scores
- Predictive alerts (e.g., risk of falling or signs of fatigue)
- Integration with home-based medical IoT devices (e.g., blood pressure monitors, glucometers)

3.67 Traveler Mode Activation

3.67.1 Users can activate "Traveler Mode" before starting a trip. They will be asked to enter:

- Travel destination(s)
- Travel dates
- Purpose of travel (e.g., leisure, business, medical tourism, pilgrimage)
- Emergency contact person at the destination

Based on this information, the app will generate a medical summary in the appropriate format and language.

3.68 Exportable Medical Summary

3.68.1 The system will create a concise and standardized health summary that includes:

- Personal information: name, age, blood group, known allergies
- Ongoing medical conditions (e.g., diabetes, heart disease)
- Current medications, with dose and frequency

- Recent lab or test results (e.g., ECG, blood work)
- Doctor or hospital information, if ongoing care is expected
- Insurance provider contact and emergency numbers

3.68.2 Export formats include:
- PDF (printable or downloadable)
- FHIR JSON (for use in digital health systems)
- Offline version within the app (available during travel)

3.69 QR-Based Medical Summary Card

3.69.1 A secure QR code will be generated containing:
- A digital health summary or a link to a secure cloud version
- Optional emergency contact or doctor's note

3.69.2 Display options:
- On phone lock screen
- As a printed card to carry while traveling
- Embedded into an NFC-enabled physical health card

All emergency views are **read-only** and **time-limited** for privacy.

3.70 Multilingual Support

3.70.1 The health summary and QR data can be automatically translated into:
- The local language(s) of the travel destination (e.g., Spanish, German, Arabic, Japanese)
- English as the default fallback language
-

Both text and voice playback options are supported for accessibility.

Users can select the translation manually or enable auto-detection based on destination.

3.71 Offline Access & Smart Sync

3.71.1 While in Traveler Mode, the app ensures:
- Full offline access to the medical summary and QR code
- Automatic syncing when internet is available
- Cloud backup of the latest medical summary before departure

3.72 Doctor/Hospital Access Mode

3.72.1 Users can choose to host their summary temporarily on the cloud:
- A secure link (valid for 7 or 30 days) is generated
- Link is embedded in the QR code
- Doctors can access using a PIN or OTP
- Access logs are recorded for privacy monitoring

3.73   Integration with Travel/Embassy Portals

3.73.1 Users may choose to share the medical passport with:

- o   Travel insurance companies
- o   Embassy or consulate (for high-risk travelers)
- o   Airlines or immigration officials if medically required

The system can also include optional data like vaccination records or recent COVID-19 status.

3.74   Security & Access Control

3.74.1 The user remains in control of their data:

- o   Choose what information to include or exclude from the passport
- o   Set QR code expiration and protect it with a PIN
- o   Enable a limited "emergency view mode" that shows only critical health information

All data is encrypted before export or transmission.

3.75   Future - Travel Health Tips & Pre-Travel Checks

3.75.1 Planned features include:

Country-specific health tips:

- o   Recommended vaccinations
- o   Emergency service numbers
- o   Language packs for basic medical communication

Pre-travel checklist:

- o   Reminders to refill medication
- o   Upload a copy of travel insurance
- o   Notify embassy for travel to high-risk areas

3.76   Future Enhancements

3.76.1 Additional improvements may include:

- o   AI-generated health passport suggestions based on upcoming travel plans
- o   Integration with Apple Wallet and Google Wallet
- o   Partnerships with hospitals and urgent care clinics abroad
- o   Linking the medical passport with national health IDs such as India's ABHA or the EU Digital COVID Certificate

3.77   Emergency Access QR/NFC Card

3.77.1 Purpose & Use Case

- o   Designed to give paramedics or emergency doctors immediate access to key medical details
- o   Functions without requiring the user to unlock their phone or open the app

Key Health Information Included

3.77.2 Users can choose what to display on the emergency card, including:

- o Full name, age, and optional photo
- o Blood group and allergy information
- o Chronic health conditions (e.g., asthma, heart disease)
- o Ongoing medications and critical treatments (e.g., pacemakers)
- o Emergency contact details
- o Doctor or hospital information
- o Insurance ID (if permitted)

3.78 QR Code Generation & Usage

3.78.1 Generates a dynamic QR code that links to a secure, read-only health summary

3.78.2 QR can be:

- o Displayed on the lock screen

- o Printed as a wallet card or tag

- o Shared digitally (e.g., WhatsApp/email)

- o Saved in Apple/Google Wallet

Optional protection using a PIN or OTP

3.79 Future Feature - NFC Card Integration

- Physical card or wristband with embedded NFC chip

- Tapping it on an NFC-enabled device opens the emergency summary

- Data can be partially stored on the chip for offline use

- NFC tag is locked for security after encoding

3.80 Limited, Read-Only Emergency View

- Emergency page shows only essential health info

- No ability to edit or download

- Access session auto-expires (e.g., after 5 minutes)

- Logs of access attempts available to the user

3.81 Customization & Privacy Controls

3.81.1 Users have full control over:

- o What data is shown

- o Whether QR requires authentication

- o Card expiration and visibility settings

- o Only users can update card content (not doctors/admins)

3.81.2 Offline Mode Compatibility

- QR preview and emergency summary can be accessed without internet

- Device stores a fallback version locally (as HTML or image)

3.81.3 Integration with Medical Devices & Travel Passports

- Linked with:

  - o Travel Medical Passport (Section 3.8)

  - o Health wearables (e.g., Mi Band)

  - o Printable for use on medical alert jewelry

3.81.4 Language & Accessibility Support

- Multilingual output (auto-detected or user-selected)

- Optional voice playback of summary for responders

- Color coding for severe allergies or conditions (e.g., RED = high alert)

3.81.5 Future Enhancements

- Log access events for hospitals and emergency teams

- Link with ambulance networks or hotlines

- Scan-triggered emergency call shortcut (ICE)

- Biometric gesture (e.g., panic tap) to auto-display QR

3.82 Family Health Organizer - Dependent Profile Management

3.82.1 Users can create and maintain profiles for:

- o Children

- o Elderly parents

- o Spouses or partners

- o Disabled or dependent individuals

3.82.2 Each profile can include:

- o Name, photo, age, and relationship

- Health data (blood type, allergies, chronic conditions)

- Medication logs, prescriptions

- Growth tracking and vaccination history

3.83 Linked Health Records

3.83.1 Every dependent has a personal dashboard featuring:

- A timeline of medical events and uploads

- Past and upcoming doctor appointments

- Vitals from devices or manual entries

- AI-powered insights like health risks or recommendations

Family history elements (e.g., shared vaccinations) can be cross-referenced.

3.84 Smart Reminder System

3.84.1 Set reminders for each family member:

- Medications

- Doctor visits

- Vaccinations and wellness check-ins

- Mental health prompts (if enabled)

3.84.2 Reminders can be:

- Pushed to a caregiver's phone

- Shared with multiple guardians

- Viewed in a color-coded family calendar

3.85 Caregiver Collaboration

3.85.1 Invite others to help manage a dependent's profile:

- Spouse, siblings, or professional caregivers

- Assign different permission levels (View/Edit/Full Control)

- Team members can flag concerns and upload shared records

3.86 Shared Access & Permissions

3.86.1 Role-based access settings:

- **Owner** – primary user

- o **Guardian** – partial control

- o **Viewer** – limited access (e.g., doctors or insurers)

Emergency mode grants restricted access to summaries.
Ownership can be transferred (e.g., when a child becomes an adult).

3.87   Family Health Timeline & Insights

3.87.1 A unified view of the entire family's health:

- o Timeline of events (e.g., vaccines, tests)

- o Trend analysis across profiles (e.g., recurring flu cases)

- o AI-generated tips like "schedule yearly checkups for the whole family"

3.88   Insurance & Records Linking

3.88.1 Each profile can be connected to:

- o Their own insurance policies

- o Preferred doctors and hospitals

- o Health trackers or wearables (for kids or elders)

3.89   Voice Assistant & Accessibility

3.89.1 Supports voice commands for caregivers, such as:

- o "Show Mom's blood pressure history"

- o "Remind me to give my child medicine at 9 PM"

The interface is designed to support caregivers with low vision or cognitive challenges.

3.90   Alerts & Escalations

3.90.1 For dependents:

- o Critical health alerts notify all guardians

- o Escalations occur for abnormal vitals (e.g., low oxygen in elderly)

- o System can recommend specialists nearby if a condition worsens

3.91   Future Enhancements

3.91.1 Planned features include:

- o Budgeting and health expense tracking for the family

- o Custom care plans for nutrition, medication, and wellness

- o Syncing with schools or elder care homes

- o AI alerts for inherited medical risks

3.92 Pharmacy Prescription Upload & Processing

3.92.1 Prescription Upload & Processing

3.92.2 Users can upload medical prescriptions through:

- o File upload (PDFs, images, scanned documents)

- o In-app camera scanner with automatic cropping and enhancement

- o Direct upload from the doctor's module after a consultation

3.92.3 The system uses OCR and Natural Language Processing (NLP) to extract:

- o Medication names, dosages, frequency, and duration

- o Suggested lab tests (e.g., CBC, Lipid Profile)

- o Doctor's name, date, and hospital for validation

3.93 Automatic Medicine Ordering

3.93.1 After a prescription is uploaded, the system can suggest a refill or first-time order. Key features include:

- o AI engine recommends generic alternatives and branded medications

- o User selects brand, format (tablet, syrup), and dosage

- o Automatic quantity calculator based on prescription duration

3.93.2 Partner pharmacy integration provides:

- o Real-time inventory and pricing

- o Delivery time estimates and slot selection

- o Order tracking from dispatch to delivery

3.94 Preferred Pharmacy Partners & Filters

3.94.1 Users can choose from:

- o Local pharmacies for same-day delivery

- o Online pharmacies like PharmEasy, 1mg, Netmeds, or Amazon Pharmacy

- o Insurance-approved pharmacy networks

3.94.2 Filters include:

- o Price comparison

- o Delivery speed and service ratings

- o OTC (over-the-counter) vs. prescription-only medications

3.95 Reminders & Auto-Refill

3.95.1 Users can:

- o Set up manual or automatic medicine refill reminders

- o Enable auto-refill subscriptions for chronic conditions (e.g., thyroid medication)

- o Get alerts when a refill is dispatched or delayed

- o Notify caregivers if they manage dependent prescriptions

3.96 Lab Test Booking

3.96.1 AI can recommend relevant lab tests based on:

- o Doctor's prescription

- o Health insights and predictions from the AI risk engine

3.96.2 Users can:

- o Book home collection or lab visit

- o Compare labs based on pricing, ratings, availability

- o Track sample collection and test status in real time

3.97 E-Reports & Record Integration

3.97.1 Lab test results are:

- o Automatically uploaded to the user's medical timeline

- o Analyzed by AI to flag abnormal values

- o Summarized (e.g., "Low Vitamin D levels detected")

- o Compared with past results to track trends (e.g., HbA1c over time)

3.98 Payment & Insurance Integration

3.98.1 Users can pay for services via:

- o UPI, debit/credit cards, digital wallets, net banking

- o Insurance (if the plan covers the test or medication)

3.98.2 Features:

- o Auto-generated invoice and insurance claim documents
- o Bills are stored securely with health records for future reference

3.99 Notifications & Status Tracking

3.99.1 Real-time updates are sent via push, SMS, or email for:

- o Order status (dispatched, delayed, delivered)
- o Test appointment reminders and result notifications
- o Cold-chain tracking for sensitive medications (e.g., insulin)

3.100 Security, Verification & Compliance

3.100.1 Security measures include:

- o Prescription validation by pharmacists or AI to prevent misuse
- o End-to-end encryption for all pharmacy and lab transactions
- o Compliance with HIPAA and GDPR regulations for health data handling

3.101 Future Enhancements

3.101.1 Planned features for this module:

- o Drug interaction checker for uploaded medications
- o Pill intake tracking and adherence scoring
- o Integration with national health systems (e.g., NDHM for e-prescriptions)
- o Preventive health bundles (e.g., doctor consult + labs + supplements)

3.102 Data Backup and Sync – Offline Mode Support

3.102.1 Users can continue to use key app features even without internet:

- o Access recently viewed medical records and AI summaries
- o Use emergency QR/NFC cards and travel medical passports
- o View cached prescriptions, health summaries, and reminders

3.102.2 Offline capabilities also include:

- o Uploading new medical files (which sync when online)
- o Viewing offline reminders
- o Editing dependent profiles

The app uses a lightweight local database for fast performance and low storage usage.

3.103 Secure Cloud Sync

3.103.1   When the device is connected to the internet, the following data is synced automatically:

- Medical records (images, PDFs, structured documents)

- Health data from wearables

- AI-generated predictions, reminders, and logs

- Family profiles and insurance documents

High-priority items like prescriptions and appointments are synced in real time.
Sync processes are battery-optimized and run in the background.

3.104 End-to-End Data Encryption

3.104.1   To protect user data, the system uses:

- **AES-256 encryption** for data at rest (on device and cloud)

- TLS 1.3 encryption **for data in transit (uploads/downloads)**

3.104.2   Advanced security options:

- Optional **zero-knowledge architecture** (platform cannot view your data)

- Biometric unlocking (Face ID / Fingerprint) for sensitive files

- Tamper detection with alerts for suspicious activity

3.105 Smart Conflict Resolution

3.105.1   If two versions of a file exist, the system resolves it by:

- Comparing timestamps to determine the most recent version

- Asking the user to confirm when conflicts occur

- Allowing rollback to earlier versions (up to 3 previous states)

3.106 Device & Session Syncing

3.106.1   The app supports multi-device usage (phone, tablet, web):

- Unified device management panel

- Remote logout from other devices

- o Encryption key refresh every time a new login is detected

3.107 Cloud Infrastructure

3.107.1   Cloud storage is hosted on trusted platforms:
- o AWS S3, Azure Blob, or Google Cloud
- o Region-specific storage (e.g., India, EU) to meet legal requirements
- o Disaster recovery, auto-failover, and a 99.9% uptime service level
- o Daily automated backups

3.108 Storage Tiers & Subscription Plans

3.108.1   Free Plan:
- o 1 GB cloud storage
- o Unlimited offline access to summaries and emergency features

3.108.2   Premium Plans (monthly/yearly):
- o 5 GB / 25 GB / 100 GB options
- o Faster sync performance
- o Shared storage for family accounts
- o Early access to AI features and offline voice assistant

3.108.3   Users may also earn bonus storage by:
- o Referring new users
- o Opting in to contribute anonymized data for AI model training

3.109 Backup & Restore Tools

3.109.1   Manual backup options:
- o Export all records as encrypted ZIP or PDF
- o Optional export to USB for physical archival

3.109.2   One-Tap Recovery:
- o Restore full account during reinstallation or on a new device
- o Requires OTP or biometric verification for security

3.110 User Controls & Transparency

3.110.1   The app provides clear visibility into backup status:
- View used vs. available storage
- Check last backup timestamp and sync health

3.110.2   User-controlled settings include:
- Pause or resume auto-sync
- Selective sync (e.g., exclude large media files)
- Permanently delete cloud backups (GDPR "Right to Erasure" supported)

3.111 Future Enhancements

3.111.1   Planned features:
- Blockchain-based audit trails for tracking changes
- AI-driven suggestions like "This file was changed on another device"
- (*Future Feature*) decentralized encrypted peer-to-peer (P2P) backups

3.112 Voice Assistant & Local Language Support

3.112.1   Users can interact with the app using natural voice commands to:
- Search medical records (e.g., "Show my last blood test")
- Set or update reminders (e.g., "Remind me to take insulin at 8 PM")
- Ask health-related questions (e.g., "What does high creatinine mean?")
- Navigate to app sections (e.g., "Go to insurance")
- Access family profiles (e.g., "What's my child's vaccination status?")

3.112.2   Response modes include:
- Voice feedback (text-to-speech)
- On-screen cards with visual highlights

3.113 Supported Commands (Examples)

Medical Data:

- "Show my heart report from June"
- "What were my last sugar levels?"

Reminders:

- "Remind me to take thyroid meds at 9 AM"

- "Cancel my appointment reminder"

Navigation:

- "Open Doctor Consult"

- "Search records for diabetes"

Emergency:

- "Show my emergency QR"

- "Call my emergency contact"

3.114 Multilingual Voice Command Support

3.114.1   Voice commands are supported in various regional and global languages:

- o Users can set a preferred default language

- o Future: Mixed-language recognition (e.g., Hinglish, Tanglish)

- o Auto-detection of spoken language (optional)

3.115 Multilingual User Interface (UI)

3.115.1   The full app interface can be displayed in the user's preferred language:

- o Language toggle available in Settings

- o Locale-sensitive formatting for date, time, units, and medical terms

- o Translated UI includes:

  - ▪ Buttons, menus, and forms

  - ▪ Health categories and labels

  - ▪ AI health tips and alerts

3.116 Accessibility & Elder-Friendly Design

3.116.1   The voice-first system is optimized for:

- o Seniors,

- o Visually impaired

- o Users with limited literacy

3.116.2   Accessibility features include:

o   Large, readable fonts

o   High-contrast color themes

o   Verbal confirmation of actions ("Reminder set for 9 AM tomorrow")

o   Adjustable speech pace and tone

3.117 Offline Voice Command Support

3.117.1   Core voice features available without internet:

o   "Show my reminders"

o   "Open QR code"

o   "Switch to emergency mode"

Powered by on-device speech recognition (e.g., Google or Apple engines)

3.118 Future - Custom Voice Command Training

3.118.1   Users will be able to define personal voice commands, such as:

o   "Doctor uncle" = Dr. Ramesh (cardiologist)

o   "Papa's meds" = Father's medication schedule

o   "My sugar" = Blood glucose history

3.119 Future – Voice Log & Command History

3.119.1   Features to improve usability and privacy:

o   View and reuse past voice commands

o   Delete voice history logs anytime

o   Voice command history stored securely with user control

3.120 Privacy & Permissions

3.120.1   All voice data:

o   Is processed with explicit user consent

o   Can run locally or be processed via secure cloud systems

o   Is encrypted end-to-end

3.120.2   Users may:

o   Disable the voice assistant completely

o Restrict it to specific modules only (e.g., only reminders or records)

3.121 Future Enhancements

- Conversational Health Coach using AI to guide wellness choices

- Voice-driven data entry (e.g., "Add BP reading: 130 over 90 for today")

- Smart speaker integration:

  o "Alexa, ask SmartHealthVault for my daughter's vaccine history"

- Support for regional dialects, including rural and colloquial language variants

3.122 Future - Mental Health Tracking – Mood Tracking & Emotional Logs

3.122.1 Users can record their emotional state daily using:

  o Emoji-based mood scale

  o Tags for specific feelings (e.g., "anxious," "joyful")

  o Short journal entries (text or voice)

  o Noting triggering situations (e.g., "work stress")

Visual dashboards display emotional trends across days, weeks, and months.

3.123 Mental Wellness Scoring

3.123.1 An AI-generated score (0–100) summarizes the user's overall mental health. It is based on:

  o Frequency and content of mood logs

  o Sleep duration and patterns (via wearable sync)

  o Reported or detected stress signals

  o Daily habits such as physical activity or social withdrawal

  o Answers to mental health questionnaires

3.123.2 Score ranges:

  o **80–100:** Healthy and balanced

  o **60–79:** Needs attention

  o **Below 60:** Suggests seeking help or deeper review

3.124 Standardized Mental Health Screeners

3.124.1   Optional monthly self-check tools:

- PHQ-9 **(depression)**

- GAD-7 **(anxiety)**

- PSS **(stress levels)**

- Sleep Quality Index

3.124.2   Results include:

- Clear score interpretation

- AI-generated feedback (e.g., "You may be showing signs of moderate anxiety")

3.125 Journaling & Reflection Tools

3.125.1   The app offers:

- Daily writing prompts (e.g., "What made you smile today?")

- Gratitude logs and affirmation spaces

- Mood-linked diary and audio journaling

- Timeline or keyword-based search to revisit past entries

3.126 AI-Powered Emotional Insights

3.126.1   The system analyzes:

- Emotion trends in mood logs and journal entries

- Warning signs of burnout, depression, or anxiety cycles

3.126.2   The app may suggest:

- Customized coping ideas (e.g., nature walks, music)

- Guided mindfulness or breathing exercises

- Therapist referrals (if consented)

3.127 Alerts, Trends & Nudges

3.127.1   Triggers:

- A sudden drop in wellness score

- Extended periods of low mood or inactivity

3.127.2   Sends:

- Gentle prompts (e.g., "Take a mindful break?")

- Caregiver notifications if permitted

- Supportive reinforcement when mood improves

3.128 Mental Health Dashboard

3.128.1   Provides a complete overview:

- Daily moods and notes

- Stressor history

- Emotional trends over time

- Journal and activity logs

- Mental Wellness Score evolution

Reports can be exported (PDF) for therapists or personal reflection.

3.129 Privacy, Safety & Controls

3.129.1   All emotional health data:

- Is encrypted and stored separately from other records

- Is never shared without user permission

3.129.2   Safety features include:

- Emergency resource section (e.g., helplines, support links)

- "Need help now" button for guided crisis support

- Optional suicide/self-harm detection with user consent protocol

3.130 Optional Family/Caregiver Access

3.130.1   Users may choose to share emotional health status with:

- Trusted individuals (e.g., spouse, parent, counselor)

- Configure notifications if the wellness score falls below a user-defined threshold (e.g., 40)

3.131 Future Enhancements

3.131.1   Planned integrations include:

- Partnered wellness apps like Calm, Wysa, Headspace

- o Wearable syncing for real-time stress detection (e.g., heart rate variability)

- o AI-powered emotional forecasting based on behavior, mood, and sleep

- o Anonymous peer support forums (opt-in only)

3.132 Baby & Pregnancy Care Module – Profile Setup

3.132.1   Users can create individual profiles for newborns and toddlers with the following details:

- o Name or nickname

- o Gender and birthdate

- o Birth weight, height, delivery method

- o Blood group and known allergies

3.132.2   Features:

- o Link profile to both parents or guardians for shared access

- o Support for managing multiple babies (e.g., twins) under the same account

3.133 Vaccination Tracker

3.133.1   The app includes preloaded immunization schedules compliant with:

- o Indian (IAP), U.S. (CDC), U.K. (NHS), and other global standards

- o Option to customize based on country or pediatrician's input

3.133.2   Key features:

- o Auto-calculation of vaccine due dates from date of birth

- o Push, SMS, and email reminders for upcoming vaccinations

- o Record administered vaccines, attach doctor notes, or immunization cards

3.133.3   Optional integrations:

- o India's NDHM/ABHA health records

- o Pediatrician uploads via a secure doctor portal

3.134 Future - Growth & Development Milestone Tracker

3.134.1   Track development milestones by age group:

- o Motor skills: crawling, walking, holding toys

- o Cognitive development: smiling, responding to sounds, recognizing faces

- o Social behavior: eye contact, interaction, speech patterns

3.134.2   Visual tools include:

- o Weekly/monthly progress charts

- o Pediatrician-recommended developmental checklists

- o Alerts for missed or delayed milestones

3.134.3   Growth Charts:

- o WHO-based percentile graphs for weight, height, and head circumference

- o Clear trend indicators and comparison over time

3.135 Future - Baby Health Logs

3.135.1   Daily baby care tracking:

- o Temperature, bowel and urine logs

- o Sleep cycles and total hours slept

- o Breastfeeding/bottle feeding sessions with timers

3.135.2   Future support:

- o Syncing with compatible baby health monitoring devices

3.136 Pregnancy Care Features

3.136.1   For expecting mothers, the app provides a personalized pregnancy timeline based on due date (EDD):

- o Trimester overview and progress bar

- o Weekly fetal development snapshots

- o Important scan and appointment reminders (e.g., NT scan, anomaly scan)

3.136.2   Mother's health monitoring:

- o Track weight, blood pressure, glucose

- o Log symptoms (e.g., nausea, swelling)

- o Maintain a journal and view safe medication list

3.136.3   Additional features:

- o Nutrition and self-care tips by trimester

- o Kick counter and contraction timer for third trimester

3.137 Appointments & Reminders

3.137.1   Automated alerts for:
- Pediatric and maternal appointments
- Vaccine due dates
- Growth check-ups and scan follow-ups

Users can save doctor and hospital contact details for fast calling or reminders.

3.138 Family Sharing & Access Control

3.138.1   Users can share baby profiles with:
- Spouse or co-parent
- Grandparents, caregivers, or nannies (with view/edit permissions)
- Pediatricians via doctor portal

The system tracks who updated which data, enabling collaborative caregiving.

3.139 Medical Document Storage

3.139.1   Upload and organize baby-related records:
- Birth certificate, hospital discharge summary
- Prenatal and postnatal scan reports
- Pediatric prescriptions and allergy test results

All records are shown in a timeline grouped by life stage (infant, toddler, etc.).

3.140 AI-Powered Parental Insights

3.140.1   The system uses AI to:
- Detect missed developmental milestones
- Suggest pediatric checkups based on trends
- Flag nutrition gaps (e.g., underweight risk)
- Generate a child's health score to help with early diagnosis

3.141 Future Enhancements

3.141.1   Planned integrations include:

- o   Smart baby health devices (e.g., thermometers, scales, sleep monitors)

- o   Parenting and child health platforms (e.g., BabyCenter, BabyChakra)

- o   Regional support for multilingual users, especially in low-literacy areas

- o   Community Q&A with doctors and experienced parents

---

4. Non-Functional Requirements

4.1   Performance

4.1.1   App launch time:

- Cold start < 3 seconds
- Warm start < 1.5 seconds

4.1.2   File upload performance:

- Upload 10MB file within 10 seconds over 4G/LTE

- Progressive upload feedback with cancel/retry options

4.1.3   Low-resource support:

- App optimized for devices with <2GB RAM

- Adaptive image compression and caching for slow networks

4.1.4   Background tasks:

- Smart scheduling for sync and backup to avoid UI lag

4.1.5   AI latency:

- Response time for on-device AI actions < 1 second
- Cloud-based prediction engine < 3 seconds for inference

4.2   Security

4.2.1   Encryption:

- AES-256 encryption for all data at rest

- TLS 1.3 for all data in transit (API + file uploads/downloads)

4.2.2 Authentication:

- Secure login with 2FA via OTP/email/TOTP app

- Support for biometric login (Face ID, fingerprint)

4.2.3 Access Control:

- Role-based access: Patient, Dependent, Doctor, Insurer, Admin

- Session expiration and automatic logout on inactivity

4.2.4 Data Privacy:

- Explicit consent before AI prediction, insurance sharing, or caregiver access

- Data anonymization and de-identification for analytics (if opted-in)

4.2.5 Compliance:

- Full alignment with HIPAA, GDPR, and IRDAI guidelines

- Consent logging, audit trails, and "Right to Erasure" supported

4.3   Scalability

4.3.1 User Load Handling:

- Horizontally scalable architecture supporting 1M+ concurrent users

- Auto-scaling of API gateways, storage, and AI inference services

4.3.2 Data Storage:

- Distributed cloud storage for fast access and regional compliance

- Support for 100M+ documents, 50TB+ data with archival and search indexing

4.3.3 Concurrent Operations:

- Capable of handling 10,000+ parallel record uploads and syncs

4.3.4 Future - Multi-tenancy:

- Architecture supports white-labeled deployments for hospitals, insurers, etc.

4.4   Availability

4.4.1 Uptime & SLA:

- 99.9% minimum uptime guaranteed
- Hosted on multi-region architecture (AWS/GCP/Azure)

4.4.2   Failover and Recovery:

- Auto-failover clusters for high availability

- Disaster Recovery (DR) RTO < 4 hours, RPO < 15 minutes

4.4.3   Monitoring & Alerts:

- Real-time system health monitoring with fallback systems

- Logging + alerting for critical failures, downtimes, and sync delays

4.5   Usability

4.5.1   Design Approach:

- Mobile-first, gesture-optimized UI (React Native/Flutter)

- Tablet and web portal compatibility for doctors and admins

4.5.2   Accessibility Standards:

- WCAG 2.1 compliance (color contrast, screen reader compatibility)

- Voice support for visually impaired users

- Haptic feedback and simplified mode for motor-impaired users

4.5.3   Elder-Friendly Features:

- Large touch targets and font sizes

- Voice-assisted navigation

- Simplified mode toggle (less cluttered UI)

4.5.4   Multi-language Support:

- 10+ Indian and global languages available

- Dynamic switching and RTL support (for Arabic, Urdu, etc.)

4.5.5   Progressive Onboarding:

- Guided onboarding flows with tooltips and contextual help

- AI-based suggestions during onboarding to auto-fill or assist

5. UI Wireframe (Descriptions)

5.1 Dashboard

Purpose: Personalized health snapshot + AI-driven actions
Features:

- Overview of:
    - Health scores (overall, mental, baby, vitals)
    - Recent uploads or medical events
- AI-generated health risk alerts and suggestions
- Quick-action cards:
    - "Add a new record"
    - "Set pill reminder"
    - "Consult doctor"
- Dynamic widgets:
    - Today's appointments
    - Pending medications
    - Latest lab/test results
- Multi-profile switcher (for family members)

5.2 Records

Purpose: Medical document management hub
Features:

- Upload, organize, and view:
    - Prescriptions, diagnoses, lab reports, discharge summaries
- AI-enhanced OCR/NLP tagging and categorization
- Medical timeline view (per member)
- Search/filter by:
    - Keyword, doctor, tag, file type, abnormal values
- Version history & annotations
- FHIR/NDHM export and record sharing options

5.3 Doctors

Purpose: Doctor discovery and teleconsultation
Features:

- Find doctors by specialty, location, language
- Book in-person or video consultations
- View doctor profiles, ratings, and availability
- Pre-upload files for context
- In-consult tools:
    - Real-time record sharing
    - Shared viewer and chat

- Post-consult summaries and e-prescriptions

5.4　Insurance

Purpose: Personalized health insurance management
Features:

- AI-matched plans based on health records & risks
- Plan comparison tool with smart filters
- Apply for plans directly via app
- Track application & policy status
- View saved policies, coverage, renewal alerts
- Upload and submit claims (future feature)

5.5　Family

Purpose: Family health organizer and caregiver tools
Features:

- Add/manage dependent profiles (elderly, children, spouse)
- Assign reminders, doctors, and wearables per member
- Unified calendar view of all family health events
- View AI health scores, trends, and hereditary alerts
- Share limited profiles with guardians/caregivers

5.6　Settings

Purpose: Profile, security, language, and subscription
Features:

- Manage:
  - User profile and linked devices
  - Language and accessibility settings
  - Biometric login and 2FA
- Backup & storage control:
  - View cloud storage usage
  - Manage subscription plans
- Data export, delete account (GDPR-compliant)

5.7　Emergency

Purpose: Critical care access and offline safety
Features:

- QR/NFC-based emergency card preview
- Medical passport (traveler mode)
- Offline health summary access
- Access logs and PIN-based protection

6. Future Enhancements

Feature	Phase	Dependencies / Notes
AI Health Coach	Phase 2	Requires stable AI feedback loops and voice assistant improvements
Explainable AI (XAI)	Phase 2	Needed for compliance and transparency in AI predictions
Continuous Model Learning	Ongoing	Opt-in anonymized user data collection
Govt EHR Sync (NDHM/NHS/FHIR)	Phase 3	Access to national health APIs and user ABHA/health IDs
Hospital EMR Interoperability	Phase 3	Hospital partnerships + FHIR/HIE protocol alignment
Insurance Claim Filing Module	Phase 2	Requires partner insurer API integration + document upload UI
Smart Underwriting Engine	Phase 2–3	More health+behavioral data + insurer collaboration
Mental Health Peer Support Forum	Phase 3	Community moderation + content filters
Caregiver/Guardian Invite System	Phase 2	Role management + consent sharing workflows
Community & Local Health Forums	Phase 3	Multilingual UI + AI moderation
Pediatric & Growth Milestone AI	Phase 3	Needs labeled baby data and milestone tracking

Blockchain Audit Trails	Future Option	For record-level auditability and legal integrity
IoT Device Integration (BP, ECG)	Phase 3	BLE/IOT SDK compatibility and hardware vendor tie-ups
Offline Voice Assistant	Phase 2	Needs embedded speech engine and core command library

7. Appendix

7.1 API Integrations

- **FHIR API (REST/JSON)**: Used for EHR sync (NDHM, NHS, US systems)
- **Device APIs**: Apple HealthKit, Google Fit, Fitbit — sync vitals like HR, BP, sleep
- **Pharmacy/Lab APIs**: PharmEasy, 1mg, Netmeds, Dr. Lal, Thyrocare — for order, booking, reports
- **Insurance APIs**: Ditto, PolicyBazaar — quote matching, claim filing
- **Payment Gateways**: Razorpay, Stripe — secure checkout + webhook handling

7.2 AI Engine Summary

- **Health Risk Models**: Predict diabetes, heart disease, PCOS — using vitals + history
- **Mental Health Score**: NLP-based mood + log analysis → 0–100 risk scale
- **Insurance Match AI**: Recommends best-fit plans based on health profile + risk

7.3 Developer & Data Notes

- **Auth**: OAuth 2.0, OTP/TOTP, biometric login
- **Records**: Supports PDF, JPEG, PNG (up to 20MB); OCR → NLP → category tags
- **Storage**: Encrypted cloud storage (e.g., S3); synced with offline cache
- **Security**: Role-based access, audit logs, consent capture

7.4 AI Explainability (XAI)

Feature	Explanation
Health Risks	Shows top risk factors (e.g., high BP, BMI)

Insurance Match	"Why this plan" — based on user condition or age
Mental Score	Highlights emotional trends and anomalies

7.5 Other Tools & SDKs

- **Voice Assistant**: Intent map ("set reminder", "show report"), multi-language
- **Emergency QR/NFC**: Encodes key data with PIN access
- **Offline Mode**: Syncs on reconnect; encrypted local cache (SQLite)

---

8. Investment Summary

- Initial MVP Cost: ₹15–20 Lakhs (~$25,000)
- 5-Year Expected Profit (Global SaaS): $500,000+
- Suggested Pricing Model: Freemium + Premium tiers + Insurance/Doctor affiliate revenue

---