Human Centric Design in Health Tracking
Detailed Tech Stack Submission

Saroosh Ashraf

For the frontend, the goal was to prioritize human-centric design, ensuring an intuitive, accessible, and engaging user experience. React Native was chosen to provide a seamless experience across both iOS and Android, allowing for consistent UI/UX regardless of device. State management with Redux Toolkit ensures smooth interactions, while real-time updates via Firebase Firestore help users receive immediate feedback on their health data, fostering engagement and trust.

Component	Technology/Tool	In-Depth Explanation & Reason for Selection
Framework	React Native (JavaScript/TypeScript)	React Native is a cross-platform mobile development framework that allows developers to use a single codebase for both iOS and Android apps. It ensures faster development, code reusability, and community support. TypeScript adds type safety, reducing runtime errors.
UI Library	React Native Paper & Tailwind CSS	React Native Paper provides Material Design components, which ensure a modern and accessible UI. Tailwind CSS allows for utility-first styling, making it easy to maintain consistency across the app's UI.
State Management	Redux Toolkit / Context API	Redux Toolkit is an advanced state management library that helps in managing application-wide states efficiently. Context API is built into React and is useful for lightweight state management, reducing unnecessary re-renders.
Real-time Updates	Firebase Firestore	A NoSQL cloud database that allows real-time data synchronization across devices. It ensures that health metrics and updates are reflected instantly for users.
Authentication	Firebase Auth / OAuth (Google, Apple, Biometrics)	Provides secure user authentication with built-in support for email/password login, social logins (Google, Apple), and biometric authentication, enhancing security and ease of access.

Human Centric Design in Health Tracking
Detailed Tech Stack Submission

Saroosh Ashraf

The backend was designed with human-centric adaptability and security in mind, ensuring that health data is processed efficiently while keeping user privacy a top priority. Node.js with Express.js enables real-time interactions, crucial for features like instant alerts for abnormal health readings. PostgreSQL was selected to store personal health data securely and with high integrity, allowing for personalized insights. WebSockets were integrated to enable continuous, real-time communication between users and the system, ensuring that the app remains responsive to changing health conditions.

Component	Technology/Tool	In-Depth Explanation & Reason for Selection
Backend Framework	Node.js with Express.js	Node.js provides a non-blocking event-driven architecture, making it highly scalable and efficient for handling multiple API requests. Express.js simplifies API routing and middleware integration.
Database	PostgreSQL	A powerful, open-source relational database that supports ACID compliance, ensuring data consistency and reliability, essential for handling sensitive health data.
API Gateway	GraphQL / REST	GraphQL allows efficient data fetching by enabling clients to specify the exact data they need.
Security	OAuth 2.0, JWT	OAuth 2.0 is an industry-standard protocol for secure authorization, while JWT (JSON Web Token) provides stateless authentication, reducing backend load.
Real-time Processing	WebSockets	Enables bidirectional real-time communication, ensuring instant updates for live health monitoring and emergency alerts.
Cloud Functions	Firebase Functions / AWS Lambda	Serverless computing solutions that automatically scale based on demand, reducing operational costs while ensuring fast response times.

Human Centric Design in Health Tracking
Detailed Tech Stack Submission

Saroosh Ashraf

The AI and ML components were chosen to enhance human-centric personalization, ensuring that recommendations are tailored to the user's unique health profile. TensorFlow and PyTorch power predictive analytics and behavior modeling, allowing the system to adapt based on past activity and medical history. Natural Language Processing (NLP) with spaCy/NLTK facilitates features like journaling for mental health tracking, enabling AI to recognize emotional patterns. TensorFlow Lite ensures that AI-driven insights run efficiently on mobile devices, providing real-time feedback without excessive reliance on cloud computing, thereby enhancing user autonomy and immediate decision-making.

Component	Technology/Tool	In-Depth Explanation & Reason for Selection
AI Framework	TensorFlow / PyTorch	TensorFlow and PyTorch are the two leading deep learning frameworks. TensorFlow is widely used for production ML models, while PyTorch is preferred for research and experimentation.
NLP Processing	NLTK / spaCy	NLTK (Natural Language Toolkit) is a Python library for processing and analyzing text, useful for AI-based mental health tracking and journaling.
Predictive Analytics	Scikit-learn / Pandas	Scikit-learn provides machine learning algorithms for predictive modeling, while Pandas allows efficient data manipulation and analysis for health trends.
Computer Vision	OpenCV / TensorFlow	OpenCV is used for real-time image processing, helping recognize user movements and activities. TensorFlow models can enhance its recognition capabilities.
AI Model Deployment	Ollama	Meta's open source ollama SDK will be used to deploy a chatbot within the application that will assist the user with application functions and provide health insights