Health & Wellness Application Using MERN Stack

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1. Problem Statement

The modern lifestyle has led to an increase in stress, poor diet, and irregular sleeping habits, which in turn have caused various health and wellness challenges. Many individuals lack consistent motivation or proper tools to monitor their physical and mental well-being. The objective of this project is to develop a full-stack Health and Wellness web application that allows users to analyze their Ayurvedic constitution (Prakriti), track daily habits such as water intake and sleep, calculate BMI, and practice guided meditation for stress relief. The application combines frontend interactivity, backend APIs, and data visualization to help users build healthier habits and monitor progress effectively.

2. Literature Review

1. Health Monitoring Using IoT (2023) – Discusses various technologies that help individuals track real-time health data and the need for intelligent dashboards for better awareness.

2. MERN Stack Development (2024) – Demonstrates how MongoDB, Express, React, and Node provide a scalable environment for interactive wellness applications.

3. Ayurvedic Constitution Analysis (2022) – Highlights the importance of Prakriti assessment (Pitta, Vata, Kapha) for personalized health recommendations.

4. Visualization in Web Health Tools (2023) – Explores how Recharts and Chart.js enhance data interpretation through dynamic graphs for progress tracking.

Key Insights:

• Health tracking apps require both usability and personalization.

• MERN stack provides efficient real-time communication between frontend and backend.

• Ayurvedic and modern data-driven wellness models can be combined for holistic insights.

• Interactive visualization enhances motivation and self-awareness.

3. Methodology

3.1 Tools & Frameworks

• Frontend: React.js (Vite) with Tailwind CSS and Recharts for charts.
Backend: Node.js with Express.js for RESTful API endpoints.
• Database: (Optional extension)
MongoDB or in-memory data store.

• Visualization: Recharts for bar and pie charts (sleep, water, Prakriti results). • Languages: JavaScript (Frontend & Backend).

• Hosting: Localhost during development, deployable on Render/Netlify.

3.2 System Architecture

The project follows the MERN architecture, separating the client and server sides. Frontend(React): Handles UI components and user interactions. - Backend (Express): Manages requests, data validation, and API responses. - Visualization Layer: Displays data insights (water intake, sleep hours, and dosha balance) using Recharts.

3.3 Core Modules

• BMI Calculator: Allows users to check health status using weight and height. • Water & Sleep Tracker: Logs daily habits and visualizes trends via bar charts.

• Prakriti Analysis: A short questionnaire determining the user's Ayurvedic type (Pitta, Vata, Kapha) shown in a pie chart.

• Meditation Guide: Simple breathing phase tracker ("Inhale, Hold, Exhale"). • Contact API: Backend endpoint (/api/contact) to receive user messages.

3.4 Web Interface

• Home Page: Displays motivational tips and module shortcuts. • Tools Page: Provides calculators for BMI, water, and sleep estimation.

• Tracker Page: Displays recorded data and visualization graphs.

• Prakriti Page: Displays pie chart visualization of Ayurvedic composition.

• Meditation Page: Interactive 4-4-4 guided breathing UI for relaxation.

4. Results

The Health & Wellness application successfully integrates wellness tracking, Prakriti assessment, and guided meditation into one cohesive system.

Visualization Results: • Prakriti Pie Chart: Displays user's body-mind balance as Pitta, Vata, and Kapha percentages.

Bar Chart: Shows daily water intake and sleep duration progress over time. Performance & UserExperience . The interface is responsive, user-friendly, and motivational.

• Backend endpoints correctly process contact and Prakriti API data.

• The use of Recharts ensures clean and professional data presentation.

5. Conclusion

This Health & Wellness MERN application effectively combines modern web technologies with traditional Ayurvedic insights. It enables users to self-assess, track, and visualize their wellness metrics. The project demonstrates that personalized health tools can improve awareness, motivation, and self-care when integrated with simple analytics and visualizations. Future improvements include integrating authentication (JWT), database storage (MongoDB), and AI-based daily recommendations based on user data.

6. References

1. IsmaelAbdulrahman (2023), Enhancing Health Monitoring Applications with AI and IoT.
3. IBM MERNStack Documentation (2024), React and Express Integration Guide.
4. Ayurvedic WellnessResearch Council (2022), Principles of Prakriti and Dosha Balance.
5. Recharts Documentation (2023), Data Visualization Components for React.