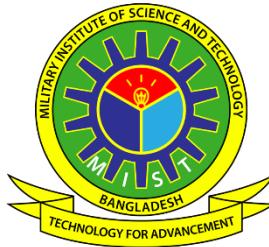


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TROOP TRACK:

Soldier's Fitness Assessment & Monitoring System

Finalized Idea Report

CSE-364: Software Development Project – 1

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1. TITLE: TROOP TRACK: Soldier's Fitness Assessment & Monitoring System

2. PROBLEM STATEMENT: Most fitness evaluations are still conducted manually, resulting in delayed assessments that hinder timely decision-making.

Existing manual processes also introduce frequent errors and inconsistencies, reducing the accuracy of recorded IPFT & fitness data.

Important IPFT records are often misplaced or incomplete, creating gaps in documentation and accountability which also creates problem during promotion.

Unit Commanding (CO) & Staff officers (Adjt, QM) face hassles to monitor individual fitness levels, track both personal and unit-wide short & long term progress, and identify high-risk soldiers such as those facing injury, obesity, or low fitness.

Hassle to monitor high-risk soldiers (injury, obesity, low fitness), and plan effective, targeted training schedules.

Absence of any notification/ alert to admin monthly or quarterly if any individual can't meet up certain military fitnesses standard.

3. BACKGROUND & MOTIVATION: Modern defense forces increasingly rely on data-driven decision-making. Physical fitness directly influences soldier survivability, performance, and mission outcome. Manual record-keeping fails to provide real-time insights or accurate monitoring of soldiers' physical health. A digital fitness monitoring system ensures accuracy, efficiency, accountability, and readiness assessment. It also can help medical officers to detect early warning signs, trainers optimize workout plans, and commanders evaluate unit-wide preparedness.

4. LITERATURE REVIEW:

Existing Study	Focus Area	Limitations
Military Services Fitness Database (MSFD) — 2009	Tracks soldier fitness, weight, and body-fat over time	Retrospective only; no real-time monitoring; no nutrition/injury data
Holistic Health and Fitness Management System (H2FMS) — 2025	Integrates fitness, nutrition, sleep, injury, performance; dashboards	High cost; complex; limited to well-resourced forces
Real-time Monitoring of Military Health — 2025	Real-time Monitoring of Military Health — 2025	Real-time Monitoring of Military Health — 2025
WearableMil: Military Activity Recognition — 2024	WearableMil: Military Activity Recognition — 2024	WearableMil: Military Activity Recognition — 2024
Usability of Wearable Physiological Devices — 2025	Evaluates usability and feasibility of wearables	Limited long-term data; integration with systems not tested

These limitations justify the need for a military unit's robust, real-time, and fitness monitoring solution like Soldier's Fitness Assessment & Monitoring System .

5. OBJECTIVES

- a. To automate fitness evaluations for timely, accurate assessments with real-time visibility for admins

- b. To ensure complete, error-free, and securely stored IPFT records through a centralized system
- c. To identify high-risk soldiers through integrated performance and health analytics
- d. To enable long-term tracking of soldier progress and overall unit readiness by developing targeted training schedules
- e. To issue automated notifications for monthly mile tests and required physical activities when certain military standards are not met

6. KEY FEATURES

a. Soldier's Dashboard

- 1) Unique Soldier ID (Service No)
- 2) Personal details: age, rank, height, weight
- 3) Medical category (A, B, C, Temporary)
- 4) Injury records and recovery tracking
- 5) Weight limitations based on age and height (Auto BMI Calculation)

b. Fitness Test Module

- 1) Standard military fitness tests (mile test, push-up, sit-up, pull-up, rope climbing, swimming)
- 2) Automated pass/fail calculation and progress tracking (quarterly/monthly/IPFT)
- 3) Long-term performance charts for individual and unit

c. Nutrition & Hydration Monitoring

- 1) Personalized nutrition and hydration plans based on medical conditions, training intensity, and weight goals (will change basing on weight, health condition, IPFT performance)

d. Alerts & Notifications

- IPFT reminders

- Low-performance and overweight alerts
- Notifications for failing to meet military standards

e. Command & Admin Dashboard

- Real-time unit and individual fitness monitoring
- Fit vs unfit soldier percentage and training effectiveness comparison

f. Reports & Documentation

- Fitness test reports
- Weight limitations and medical categories
- Meal (Nutrition) and hydration schedules in PDF (Report) format

7. TARGET USERS

- a. Unit Personnel (Soldiers)
- b. SM/JCOs
- c. Company Commanders
- d. Staff Officers
- e. Commanding Officer
- f. Health Staff (if any)

8. Technology Stack

Component	Technology
Frontend	Next.js, Chart.js
Backend	Express.js, Socket.io
Database	PostgreSQL, Redis



Figure: Sign up/ Login Page

9. Conclusion: The Soldier's Fitness Assessment & Monitoring System will provide a centralized, efficient, and accurate platform to manage military fitness-related records. It replaces manual paperwork with automated scoring, real-time monitoring, and data-driven decision-making. The system supports soldiers, medical teams, and commanders through proper monitoring to ensure a fit and capable military unit.

10. References:

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