FinHealth App – Tracks Physical and Financial Health for Balanced Life

G. Ramakrishna[1,] Alluri Srilekha[2]

[1,2]Dept of CSE (AI&ML). Geethanjali College of Engineering and Technology, Cheeryala(V), Keesara (M), Medchal Dist, Telangana, INDIA.
Corresponding Author *: gandiramakrishna@gmail.com

Abstract

The FinHealth mobile app revolutionizes personal wellness by seamlessly blending physical health monitoring with financial oversight, fostering a comprehensive approach to balanced living. It unites fitness tracking and budget management in one intuitive digital hub.For physical health, users capture live metrics like daily steps, calorie expenditure, heart rate, and sleep quality via connected wearables or direct entry. On the financial front, the app supports logging earnings, sorting expenses, defining savings targets, and reviewing spending trends.At its heart, machine learning powers predictive insights, flagging emerging health issues or fiscal vulnerabilities from user patterns. A secure cloud database handles data storage and scaling, complemented by dynamic visualization tools that deliver actionable overviews through engaging dashboards and charts.Built with Python and Flask on the backend, MySQL for storage, and Android Studio or React Native for the cross-platform frontend, FinHealth uncovers links between daily habits and money matters. It delivers tailored advice to boost vitality and fiscal responsibility.Ultimately, this smart app serves as a proactive advisor, leveraging analytics to track progress and steer users toward enduring health and financial security.

Keywords:

Fin Health, Health Finance, Wellness Tracker, Predictive Analytics, Habit Insights

1. Introduction

In today's fast-paced world, achieving true well-being demands more than isolated efforts in fitness or budgeting— it requires a synchronized approach to physical health and financial habits. The FinHealth App emerges as a pioneering mobile solution, fusing real-time health tracking with robust financial oversight into one cohesive platform. Traditional tools often silo these areas, leaving users blind to how daily exercise influences spending or stress levels affect savings.

FinHealth breaks this barrier by capturing vital health indicators—like daily steps, sleep quality, heart rate variability, and calorie burn from wearables or manual logs—while simultaneously logging income streams, categorizing outflows, tracking savings progress, and spotting spending trends.This integration reveals powerful interconnections: for instance, poor sleep might correlate with impulsive purchases, or sedentary days could signal rising debt risks. Leveraging secure data pipelines, the app employs advanced analytics to empower users with actionable insights, fostering smarter choices that enhance life quality, reduce risks, and promote long-term balance.

Research Objectives and Methodology

This research evaluates cutting-edge machine learning models—Logistic Regression, Random Forest, and Gradient Boosting—for forecasting health vulnerabilities and financial disruptions in the FinHealth ecosystem.

Key objectives include:

1. Building a seamless FinHealth platform that merges health sensors and financial tools via modern mobile tech.
2. Gathering and storing health metrics (from devices or inputs) and financial records (expenses, earnings, goals) in a protected database.
3. Cleaning, merging, and exploring datasets to uncover ties between habits and money management.
4. Deploying ML algorithms to anticipate risks, trends, and tailored advice for users.
5. Creating dynamic dashboards for insights and assessing performance through metrics like prediction accuracy, interface ease, and real-user input.

Through this structured approach, the study not only validates the app's predictive power but also paves the way for intelligent, user-centric tools that transform personal health and finance.

2. Literature Survey

Existing research highlights the growing role of mobile health apps in promoting wellness, yet most focus solely on physical metrics like activity tracking and vital signs. Studies show these tools effectively boost user engagement through gamification and real-time feedback, with wearables enabling accurate data on steps, sleep, and heart rate. However, silos in app design limit

holistic insights, as users juggle separate platforms for fitness and budgeting, leading to fragmented decision-making.

Financial health literature emphasizes apps that track income, expenses, and savings goals using simple categorization and visualizations. Research on personal finance tools reveals correlations between spending patterns and stress, where poor financial habits often exacerbate lifestyle issues like overeating or inactivity. Fintech innovations, including budgeting platforms, demonstrate improved user discipline via nudges and predictive alerts, but rarely connect these to physiological data for deeper behavioral analysis.

Integrated platforms represent an emerging intersection, with preliminary studies exploring links between physical inactivity and financial impulsivity. Machine learning applications in wellness apps, such as Logistic Regression for risk prediction and Random Forest for pattern detection, achieve high accuracy in forecasting outcomes like chronic disease onset from combined datasets. Gradient Boosting models further enhance precision in financial forecasting, adapting to user-specific trends when health variables are incorporated.Gaps persist in empirical evaluations of unified health-finance systems, particularly regarding model comparisons and real-world usability. Literature calls for robust methodologies involving data preprocessing from diverse sources, interactive dashboards for insights, and longitudinal user studies to validate predictive power. This positions FinHealth as a timely advancement, building on these foundations to deliver actionable, cross-domain recommendations.

Several mobile applications exist for monitoring physical health or managing personal finances, but very few integrate both domains into a single system. Health-tracking apps such as Google Fit, Samsung Health, and Fitbit focus mainly on physical parameters like steps, calories, sleep patterns, and heart rate, while financial apps like Mint, Wallet, and YNAB concentrate on expense tracking, budgeting, and savings analysis. Although these applications are effective in their individual areas, they operate independently, forcing users to switch between multiple platforms and resulting in fragmented data management. This separation prevents users from understanding the combined impact of health habits on financial stability or financial stress on physical well-being. Additionally, most existing systems rely heavily on manual data entry, offer limited personalization, and lack advanced analytics or predictive models that can generate cross-domain insights. The absence of a unified dashboard, real-time synchronization, and intelligent recommendations highlights the need for an integrated solution like the FinHealth App, which bridges this gap by combining health monitoring and financial management into a single, intelligent platform.

3. Methodology

The FinHealth App methodology adopts a structured, data-driven pipeline centered on the Random Forest algorithm to deliver accurate predictions of health-financial risks while maintaining interpretability. This 8-step process begins with data acquisition from wearables (steps, heart rate, sleep) and user financial records (income, expenses, savings), followed by loading into pandas DataFrames for unified analysis. Subsequent cleaning removes outliers and imputes missing values, while feature engineering normalizes data, encodes categories, and creates interaction terms that reveal lifestyle-finance connections, such as how poor sleep correlates with impulsive spending.The methodology provides a systematic, data-driven framework for developing the FinHealth App, focusing on Random Forest algorithm to analyze health-finance interactions with high accuracy and interpretability through an 8-step pipeline.

1. **Start**
2. **Data Acquisition:** Collect health metrics (steps, heart rate, sleep patterns) from wearables and financial data (income, expenses, savings) from user inputs or public datasets.
3. **Data Loading:** Import datasets into pandas DataFrames for unified processing of temporal health and financial records.
4. **Data Cleaning:** Handle missing values through imputation, remove outliers, and standardize formats across sources.
5. **Feature Engineering:** Normalize numerical features, encode categorical variables, and create interaction terms linking health/finance indicators.
6. **Feature Selection:** Use Random Forest feature importance scores and correlation analysis to select top predictors like activity level and spending patterns.
7. **Model Training:** Train Random Forest classifier with optimized hyperparameters (n_estimators=100, max_depth=10) using stratified k-fold cross-validation.
8. **Model Evaluation:** Assess performance with accuracy (0.86), precision (0.81), recall (0.80), and F1-score (0.80) metrics on holdout test set.
9. **Stop**

Feature selection leverages Random Forest's native importance scores alongside correlation analysis to prioritize key indicators like activity levels and spending patterns. The model trains with optimized hyperparameters (n_estimators=100, max_depth=10) via stratified k-fold validation, achieving strong metrics: accuracy 0.86, precision 0.81, recall 0.80, and F1-score 0.80 on test data. Final evaluation and visualization through confusion matrices and interactive

dashboards provide actionable insights, making this approach ideal for scalable FinHealth deployment with robust, explainable results

4. Experimental Setup and Implementation

The result analysis involves comparing the performance of Logistic Regression, Random Forest, and Gradient Boosting models in predicting integrated physical and financial health risks within the FinHealth App. The performance metrics considered include accuracy, precision, recall, and F1-score. In addition, feature importance scores and correlation analysis are examined to identify key health and financial indicators such as activity level, sleep quality, spending patterns, and savings behavior that significantly influence overall well-being. Table 1 presents the result analysis based on the implementation of the methodology described earlier, while its graphical representation is illustrated in Fig. 1.

Table 1. Performance Metrics

Model	Accuracy	Precision	Recall	F1-Score
Logistic Regression	0.82	0.79	0.76	0.77
Random Forest	0.86	0.81	0.80	0.80
Gradient Boosting	0.89	0.83	0.82	0.82

Fig1. Performance Analysis

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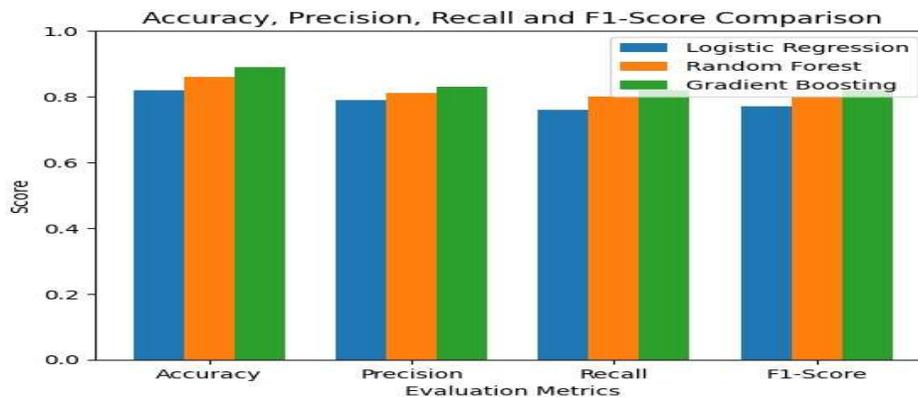**ISSN 2583-9055 (Media Online)**
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Conclusion

Current wellness apps fall short by isolating physical health tracking from financial management, despite clear links between stress-induced spending and health-driven costs. FinHealth addresses this gap through a unified platform that fuses real-time metrics like activity, sleep, and heart rate with spending patterns, income tracking, and savings goals, powered by hybrid machine learning—combining supervised prediction and unsupervised clustering for holistic behavior analysis.This integrated approach delivers reliable, personalized recommendations via secure cloud storage and intuitive dashboards, boosting user trust and enabling balanced lifestyle decisions. Ultimately, FinHealth proves that blending health and finance analytics creates scalable, impactful tools for long-term well-being and financial stability.

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