



SMART INDIA HACKATHON 2024



LIFE - LENS

- PROBLEM STATEMENT TITLE- AI ENHANCED HEALTHCARE DIAGNOSTICS AND MANAGEMENT SYSTEM INSPIRED BY ZK MEDICAL BILLING PLATFORM
- THEME-HEALTHCARE & BIOMEDICAL DEVICES
- PS CATEGORY- SOFTWARE
- TEAM NAME - CIRCUITALCHIX

AI-ENHANCED HEALTHCARE DIAGNOSTICS AND MANAGEMENT SYSTEM INSPIRED BY ZK MEDICAL BILLING PLATFORM

Proposed Solution

The solution is an AI-driven healthcare platform that uses machine learning models to analyze patient data and provide predictive insights. Built with Flask, TensorFlow, and React.js, the platform integrates seamlessly with existing healthcare systems, ensuring easy adoption by professionals.

Addressing the Problem

This solution tackles the challenge of inaccurate diagnoses and delayed treatments by offering highly accurate predictions and real-time data analysis. It empowers healthcare providers with actionable insights, improving patient outcomes and operational efficiency.

Innovation & Uniqueness

The platform stands out through its focus on precision and user experience, offering a user-friendly interface and a robust backend that supports continuous learning from real-world data, ensuring its effectiveness and relevance in diverse healthcare scenarios.

CIRCUITALCHIX

TECHNOLOGY USED



Backend:
Flask
Flask-CORS
Pickle
TensorFlow
PIL (Pillow)
NumPy

Frontend:
React.js
Axios
HTML/CSS
JavaScript/JSX

FEASIBILITY AND VIABILITY

Feasibility Analysis

The project is technically feasible using established technologies like Flask, TensorFlow, and React.js, with a strong demand in the AI-driven healthcare market. Operational success depends on machine learning expertise and data availability.

Challenges & Risks

Key challenges include ensuring data privacy (HIPAA/GDPR compliance), achieving high model accuracy, sourcing quality datasets, user adoption, regulatory approvals, and competition from established players.

Strategies

Overcome these challenges by implementing strong data encryption, improving models with real-world data, collaborating with healthcare institutions, focusing on user-friendly design, starting regulatory processes early, and targeting niche markets.

IMPACT AND BENEFITS

The proposed solution significantly improves healthcare accessibility by offering preliminary health assessments, particularly benefiting remote and underserved areas. This can reduce the need for immediate in-person consultations and support early disease detection, leading to timely interventions and better health outcomes. Healthcare providers benefit from quicker, more informed decision-making, enhancing efficiency and patient care.

Key benefits include the convenience of accessing health predictions from any internet-connected device, cost savings by reducing unnecessary visits and tests, and scalability, allowing the platform to evolve with healthcare needs. The solution is also customizable to different populations, ensuring it meets regional health trends and individual needs.

RESEARCH AND REFERENCES

1. Detecting Malaria: A CNN-based model for detecting malaria from cell images.

(<https://www.kaggle.com/code/kushal1996/detecting-malaria-cnn/input>)

2. Liver Disease Prediction: Machine learning approach for predicting liver disease.

(<https://www.kaggle.com/code/benuvarghesebenjamin/liver-disease-prediction>)

3. Heart Disease Prediction: Predictive model using various machine learning techniques.

(<https://www.kaggle.com/code/farzadnekouei/heart-disease-prediction>)

4. Diabetes Dataset for Beginners: Exploratory analysis and prediction for diabetes.

(<https://www.kaggle.com/code/melikedilekci/diabetes-dataset-for-beginners>)

5. Chronic Kidney Disease Prediction: Achieving 98% accuracy in predicting chronic kidney disease.

(<https://www.kaggle.com/code/niteshyadav3103/chronic-kidney-disease-prediction-98-accuracy>)