



CONFLUENTIA'25

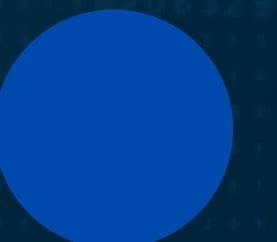
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PS -5

BY FOXO

HEALTH REPORT ANALYSIS &
INSIGHT ENGINE



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Tech Stack

Problem

Approach





PROBLEM

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- **Challenge**: Medical reports, like blood tests, are filled with critical data about your health, but they are often complex and difficult for the average person to understand. This creates a barrier to proactive health management.
- **Gap**: People are left with important questions: "What do these numbers mean?", "Are my levels normal?", and "What should I do next?". This uncertainty can lead to anxiety and missed opportunities for early intervention.
- **Need**: There is a clear need for a tool that can translate complex medical data into simple, personalized, and actionable insights, empowering individuals to take control of their health.



INSIGHTS

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- The primary problem isn't a lack of data, but a lack of clear interpretation. For the most critical insights, complex machine learning is not required.
- **Rule Base Analysis** :- A Rule-Based System offers a transparent, reliable, and highly effective solution. By defining clear, medically-backed rules (e.g., "If Total Cholesterol > 200 mg/dL, then status is 'Borderline High'"), we can automate the analysis instantly.

Why This Approach?

- **Transparent & Auditable:** The logic is straightforward and easy to verify.
- **Maintainable:** Medical rules can be updated in a central database without changing the application's code.
- **Fast & Efficient:** It directly addresses the user's need for immediate interpretation without the overhead of ML models.



OUR SOLUTION

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A secure MERN stack application that transforms raw health reports into clear, actionable insights.

How It Works:

1. **Secure Upload & Login:** Users sign in with their Google account via Passport.js and upload health reports in XLSX/CSV, or JSON format as well as manual biomarker entry.
2. **Intelligent Parsing:** The backend automatically extracts key biomarker data from the files.
3. **Rule-Based Analysis:** Our core json-rules-engine evaluates the data against a comprehensive set of rules stored in MongoDB, personalized for the user's age and sex.
4. **Insightful Dashboard:** The results are presented on a clean, interactive React dashboard featuring:
 - At-a-glance status of key diseases with biomarker level (e.g., Normal, High).
 - Simple, actionable recommendations in plain language.



DEMO

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Why Choose HealthInsight?



Easy Upload

Upload your health data in CSV, Excel, or JSON format with just a few clicks.



Smart Analysis

Get instant insights and recommendations based on your biomarker data.



Trend Tracking

Visualize your health trends over time with interactive charts and graphs.



Secure & Private

Your health data is encrypted and stored securely with Google authentication.

How It Works

1

Upload Report

Securely upload your lab report in any supported format

2

Get Analysis

Our system analyzes your biomarkers against medical standards

3

Track Progress

Monitor your health trends and follow personalized recommendations



NEXT STEPS

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Enhance PDF Parsing:

- Add rule-based PDF parser to handle a wider variety of unstructured and complex lab report layouts.
- Integrate Optical Character Recognition (OCR) capabilities to support scanned documents and images, not just text-based PDFs.

Introduce Custom Machine Learning Models:

- Goal: Move beyond static thresholds to provide predictive insights on potential health risks.
- Implementation: Develop a custom ML model to analyze longitudinal biomarker data (trends over time) and identify subtle patterns that may indicate an elevated risk for conditions like cardiovascular disease or diabetes.
- Implications: This would offer more sophisticated, proactive health guidance. However, it requires a large, anonymized dataset for training and rigorous validation to ensure accuracy and avoid bias. Explainability of the model's predictions would be a critical focus.



SUBMISSIONS

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GITHUB REPO

- https://github.com/sksmagr23/saic_hackathon_frontend
- https://github.com/r120dhirman/saic_hackathon_backend

DEPLOYED LINKS

- Frontend:- <https://saic-hackathon-frontend.vercel.app/>
- Backend:- <https://saic-hackathon-backend.onrender.com>



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THANK YOU