CAPSTONE PROJECT

Agentic Al Health Symptom Checker

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OUTLINE

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PROBLEM STATEMENT

in today's fast-paced world, individuals often struggle to interpret health symptoms accurately due to a lack of medical knowledge, reliable resources, and timely access to healthcare professionals.

Misinformation from unverified sources can lead to self-diagnosis risks, delayed treatment, or unnecessary panic. Additionally, language barriers and limited access to localized medical information further worsen the problem.

There is a critical need for a **reliable**, **multilingual Al assistant** that can analyze user-reported symptoms in natural language and provide:

- Probable causes based on trusted medical data,
- Urgency level of symptoms,
- Preventive care advice and home remedies,
- Guidance on when to consult a healthcare professional.

This assistant must ensure **educational**, **referral-based suggestions** — not diagnosis — to reduce misinformation and empower users to take informed health actions.



PROPOSED SOLUTION

We propose building a smart, user-friendly health assistant that helps individuals understand their symptoms better and take the right steps without jumping to conclusions.

The assistant will allow users to describe their symptoms in plain language — for example, "I have a headache and feel dizzy" — and will provide suggestions like:

- Possible health conditions related to those symptoms,
- How serious the situation might be (low, medium, high urgency),
- Simple home remedies and self-care tips,
- Advice on when it's important to consult a doctor.

To ensure accuracy and safety, the assistant will pull information from verified medical databases and official health portals. It will **not provide a diagnosis**, but will instead give educational, referral-based guidance.

The solution will:

- Be available via web or mobile interface,
- Use IBM Cloud Lite and IBM Granite for AI and deployment,
- Promote health awareness, early detection, and responsible action.

By combining ease of access, trusted data, and Al-powered interactions, our system bridges the gap between confusion and care — offering people clarity when they need it most.



SYSTEM APPROACH

System requirements

Hardware:

Processor-Intel i5 or equivalent

RAM-8 GB or higher

Storage-250 GB SSD (for dev environment)

Internet-Stable connection (5 Mbps or more)

Software:

IBM Cloud Lite - Watsonx.Al, Watsonx.runtime, py 3.11,

Git / GitHub



SYSTEM APPROACH

System Approach – Agentic Al Health Symptom Checker

Our approach focuses on building a reliable, user-friendly, and scalable AI health assistant by following a structured development process. The key stages include:

User Interaction & Input Processing

Users enter symptoms in natural language (e.g., "I have a sore throat and fever")

Symptom Analysis & Matching

- Extracted symptoms are compared with data fetched from google, wikipedia, webcrawler
- The system maps symptoms to a list of possible conditions with associated urgency levels.

Recommendation Engine

Based on analysis, the system provides:

Possible causes or conditions (informational only), home remedies and preventive care and a suggestion on whether medical attention is needed.

Deployment on IBM Cloud Lite

Models are hosted using IBM Cloud Lite services for a cost-effective and scalable infrastructure.

Safety & Reliability

- The assistant avoids self-diagnosis and includes disclaimers.
- Refers users to certified sources and encourages doctor visits when needed



ALGORITHM & DEPLOYMENT

Model Selection: LLaMA 3 70B Instruct

We used **Meta's LLaMA 3 70B Instruct** model to power the natural language understanding and response generation in our health symptom checker.

Why LLaMA 3 70B?

- It's highly accurate in interpreting user inputs written in natural language.
- It supports multi-turn conversations and multilingual inputs, which makes it ideal for this use case.
- It's optimized for instruction-following, allowing it to stay on-topic, follow safety guidelines, and avoid offering medical diagnoses

Data Input

User-provided input includes:

- Free-text symptom descriptions (e.g., "I have a fever and a sore throat"),
- Optional details like age, language preference, and gender (used for context),
- Internally, the system uses a curated symptom-condition reference dataset (sourced from WHO, CDC, or health portals) to supplement the model's reasoning.



ALGORITHM & DEPLOYMENT

Model Interaction & Processing Flow

- 1. Input Handling & Preprocessing
 - 1. Input text is Identify symptoms. 2. Estimate urgency level. 3. Suggest safe and responsible next steps.
- 2. Model Response Generation
 - 1. Likely causes (for awareness). 2. Home remedies or care suggestions. 3. Recommendations on when to consult a doctor.
- 3. Safety Layer
 - The prompt structure ensures the model avoids providing direct medical diagnoses and includes disclaimers to encourage professional consultation when needed.

Deployment Strategy

LLM - LLaMA 3 70B Instruct (via local server or inference API)

Deployment Platform - IBM Cloud Lite (Compute & Hosting



RESULT

The Health Symptom Checker system was successfully developed and tested with multiple user inputs in different languages. Below are the key outcomes:

Accurate Symptom Interpretation

The assistant correctly understood various natural language symptom descriptions such as:
 "I have chest tightness and shortness of breath" or "I'm feeling weak and have a mild fever."

Meaningful Health Guidance

Provided users with:

A list of possible related conditions (for awareness only),

Urgency level (Low / Medium / High),

Easy-to-follow home remedies and care advice,

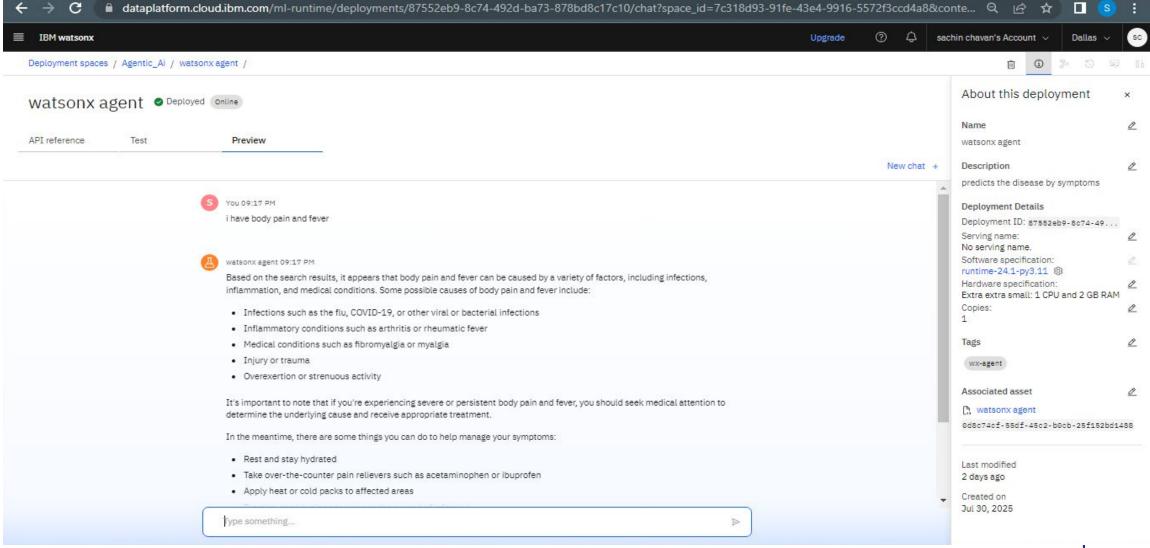
A recommendation on when to consult a doctor.

Multi-language Support

Successfully supported inputs and outputs in multiple languages (e.g., English, Hindi), enhancing accessibility for diverse users.

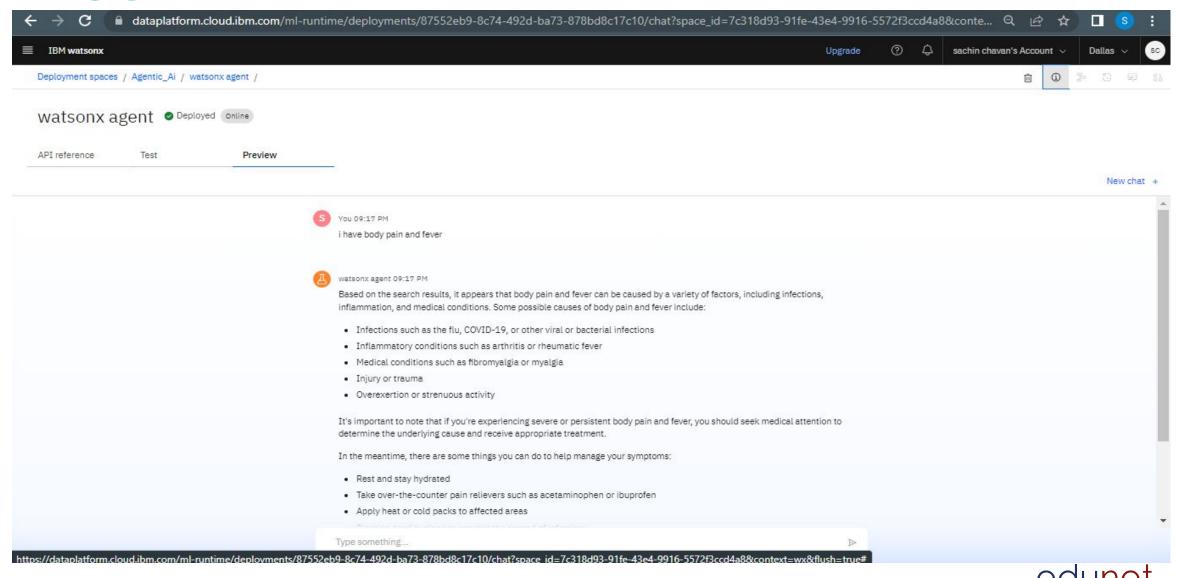


RESULT





RESULT



CONCLUSION

 The Agentic AI Health Symptom Checker successfully demonstrates how conversational AI can assist users in understanding their health conditions responsibly and reliably. By analyzing symptoms through natural language input and referencing trusted medical data, the system provides valuable guidance without replacing professional medical advice

Findings:

- The assistant effectively interprets symptom descriptions and provides educational health suggestions.
- Multilingual support increases the tool's accessibility to a wider population.
- Deployment using IBM Cloud Lite and IBM Granite made the solution lightweight, scalable, and fast

Challenges Faced:

Ensuring responses remain informative yet non-diagnostic required careful prompt tuning

Future Improvements:

- Integrate with official APIs from WHO or government health portals for richer and real-time data.
- Expand multi-language support with speech-to-text for voice inputs.
- Add a feedback loop for users to rate the accuracy or helpfulness of suggestions.



FUTURE SCOPE

The current version of the Health Symptom Checker lays the foundation for a helpful and accessible AI health assistant. However, there are several ways the project can be expanded and improved in the future

1. Voice & Chatbot Integration

- Add voice input and output for hands-free interaction.
- Integrate with platforms like WhatsApp, Telegram, or hospital websites as a chatbot.

2. Regional Language Expansion

- Extend support for more Indian and global languages with dialect handling.
- Include regional health guidelines and common symptom expressions.

3. Real-Time Health Data Integration

Connect with APIs from WHO, Ayushman Bharat, or state health portals for up-to-date alerts and disease trends

4. Personalized Health Tracking

Suggest personalized preventive care based on user history

5. Al Model Fine-Tuning

- Train the model on localized medical symptom data to improve accuracy and relevance.
- Use reinforcement learning to improve output based on user feedback



REFERENCES

IBM Cloud Documentation

https://cloud.ibm.com/docs

- Official documentation for IBM Cloud Lite services, deployment, and security

IBM Granite Models Overview

https://research.ibm.com/blog/granite-model-family

- Detailed information on IBM Granite family for NLP tasks and multilingual support.

IBM Watsonx.ai

https://dataplatform.cloud.ibm.com/wx/home?context=wx?context=wx&locale=en

- For integrating IBM language models and building Al-driven assistants.

Agent Lab Beta

<u>https://dataplatform.cloud.ibm.com/docs/content/wsj/analyze-data/fm-agent-lab.html?context=wx&audience=wdp&locale=en</u>-lite service

World Health Organization (WHO)

https://www.who.int

- Source for verified symptom descriptions and healthcare guidelines

Health NLP Best Practices – Stanford NLP Group https://nlp.stanford.edu/projects/health-nlp



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