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# CAPSTONE PROJECT

## Agentic AI Health Symptom Checker

**Presented By:**

**1. Sachin Chavan-Sitrc, Sandip Foundation, Nashik-Computer Engineering**

# OUTLINE

- Problem Statement
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- System Development Approach
- Algorithm & Deployment
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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 AI 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 AI-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.AI, Watsonx.runtime, py 3.11,

**Git / GitHub**

# SYSTEM APPROACH

## System Approach – Agentic AI 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

The screenshot displays the IBM Watsonx deployment management console. The main content area shows a chat preview for a deployment named 'watsonx agent', which is currently 'Deployed' and 'Online'. The chat interface includes a header with 'API reference', 'Test', and 'Preview' tabs, and a 'New chat +' button. The chat history shows a user query at 09:17 PM: 'i have body pain and fever'. The Watsonx agent responds at 09:17 PM with a detailed medical analysis, listing possible causes of body pain and fever (infections, inflammation, medical conditions) and providing management advice (rest, pain relievers, heat/cold packs). A text input field at the bottom prompts the user to 'type something...'. On the right, a sidebar titled 'About this deployment' provides metadata: Name (watsonx agent), Description (predicts the disease by symptoms), Deployment Details (ID: 87552eb9-8c74-49..., Serving name: No serving name, Software specification: runtime-24.1-py3.11, Hardware specification: Extra extra small: 1 CPU and 2 GB RAM, Copies: 1), Tags (wx-agent), Associated asset (watsonx agent), Last modified (2 days ago), and Created on (Jul 30, 2025).

Deployment spaces / Agentic\_AI / watsonx agent /

watsonx agent ✓ Deployed Online

API reference Test Preview

New chat +

**You** 09:17 PM  
i have body pain and fever

**watsonx agent** 09:17 PM  
Based on the search results, it appears that body pain and fever can be caused by a variety of factors, including infections, inflammation, and medical conditions. Some possible causes of body pain and fever include:

- Infections such as the flu, COVID-19, or other viral or bacterial infections
- Inflammatory conditions such as arthritis or rheumatic fever
- Medical conditions such as fibromyalgia or myalgia
- Injury or trauma
- Overexertion or strenuous activity

It's important to note that if you're experiencing severe or persistent body pain and fever, you should seek medical attention to determine the underlying cause and receive appropriate treatment.

In the meantime, there are some things you can do to help manage your symptoms:

- Rest and stay hydrated
- Take over-the-counter pain relievers such as acetaminophen or ibuprofen
- Apply heat or cold packs to affected areas

type something...

**About this deployment**

**Name**  
watsonx agent

**Description**  
predicts the disease by symptoms

**Deployment Details**  
Deployment ID: 87552eb9-8c74-49...  
Serving name: No serving name.  
Software specification: runtime-24.1-py3.11  
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Copies: 1

**Tags**  
wx-agent

**Associated asset**  
watsonx agent  
0d8c74cf-55df-45c2-b0cb-25f152bd1488

Last modified  
2 days ago

Created on  
Jul 30, 2025

# RESULT

The screenshot shows the IBM Watsonx Agent web interface. The browser address bar displays the URL: `datapatform.cloud.ibm.com/ml-runtime/deployments/87552eb9-8c74-492d-ba73-878bd8c17c10/chat?space_id=7c318d93-91fe-43e4-9916-5572f3ccd4a8&conte...`. The page header includes the IBM Watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user account information for 'sachin chavan's Account' in the 'Dallas' region. The breadcrumb trail shows the path: 'Deployment spaces / Agentic\_AI / watsonx agent /'. The main heading is 'watsonx agent', with status indicators 'Deployed' and 'Online'. Below the heading are tabs for 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. A 'New chat +' button is located in the top right corner of the chat area. The chat history shows a user message at 09:17 PM: 'i have body pain and fever'. The Watsonx agent response, also at 09:17 PM, provides a detailed answer based on search results, listing various causes of body pain and fever, including infections, inflammation, medical conditions, injury, and overexertion. It also advises seeking medical attention for severe symptoms and provides interim management tips like staying hydrated and using pain relievers. At the bottom, there is a text input field with the placeholder 'Type something...' and a send button.

Deployment spaces / Agentic\_AI / watsonx agent /

watsonx agent ✓ Deployed Online

API reference Test Preview

New chat +

**S** You 09:17 PM  
i have body pain and fever

**🧪** watsonx agent 09:17 PM  
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- Apply heat or cold packs to affected areas

Type something...

[https://datapatform.cloud.ibm.com/ml-runtime/deployments/87552eb9-8c74-492d-ba73-878bd8c17c10/chat?space\\_id=7c318d93-91fe-43e4-9916-5572f3ccd4a8&context=wx&flush=true#](https://datapatform.cloud.ibm.com/ml-runtime/deployments/87552eb9-8c74-492d-ba73-878bd8c17c10/chat?space_id=7c318d93-91fe-43e4-9916-5572f3ccd4a8&context=wx&flush=true#)

# 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. AI 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 AI-driven assistants.

## **Agent Lab Beta**

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

-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>

# IBM CERTIFICATIONS

In recognition of the commitment to achieve  
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## Sachin Chavan

Has successfully satisfied the requirements for:

### Getting Started with Artificial Intelligence



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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

**Sachin Chavan**

for the completion of

**Lab: Retrieval Augmented Generation with LangChain**

(ALM-COURSE\_3824998)

According to the Adobe Learning Manager system of record

**Completion date:** 19 Jul 2025 (GMT)

**Learning hours:** 20 mins



**THANK YOU**