IBM Cloud PROJECT

AGENTIC AI HEALTH SYMPTOM CHECKER

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OUTLINE

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PROBLEM STATEMENT

In today's digital age, individuals increasingly seek health information online, often leading to misinformation, anxiety, or self-diagnosis based on unverified sources. There is a pressing need for a reliable, intelligent, and user-friendly solution that assists users in understanding their health conditions based on symptoms they describe, while avoiding the risks of self-diagnosis.

PROPOSED SOLUTION

- Train an AI-powered Health Symptom Checker agent capable of understanding user-reported symptoms in natural language and offering educational, non-diagnostic health guidance.
- User Input & Multi-language Support:
  - System lets users talk about symptoms in many languages.
  - Uses NLP to understand and standardize user input for accurate, inclusive results.
- Symptom-to-Condition Mapping:
  - Maps symptoms to clinical terms using trusted sources like ICD-10, WHO, journals.
  - Uses APIs (public/private) for real-time medical updates.
- Risk Stratification & Triage:
  - ML ranks conditions by severity and probability, flags urgent symptoms.
  - If critical signs found, system urges immediate emergency care.
- Personalized Recommendations:
  - AI lists likely causes and gives home care tips for mild issues.
  - Guides users on when/where to get professional help or tests.

PROPOSED SOLUTION

- Preventive Advice & Education:
  - Gives health tips and warns against self-diagnosis.
  - Promotes trusted info over guesses or user-made advice.
- Referral System:
  - Guides users to nearby clinics, telehealth, or specialists.
  - Connects with provider directories when available.
- Continuous Learning & Feedback Loop:
  - Learns from anonymous feedback, outcomes, and new data.
  - Follows strict privacy rules while adapting over time.
- Data Privacy & Security Compliance:
  - All interactions are encrypted.
  - The system meets regulatory standards (such as HIPAA, GDPR) for medical data security and consent.

SYSTEM APPROACH

- System requirements
  - Compute Units - 1-2 vCPUs, 2–4 GB RAM (for testing)
  - Language Model - granite-3-3-8b instruct
  - Granite Model Access - Watsonx.ai account
  - API Hosting - IBM API Gateway
  - Storage - IBM Cloud Object Storage
  - Storage Needs - 2 GB ram for logs and configs (lite)
  - Billing Plan - Lite
- Library required to build the model
  - flask
  - ibm_watsonx_ai
  - ibm_watsonx.Runtime
  - python-dotenv
  - langchain
  - sentence-transformers

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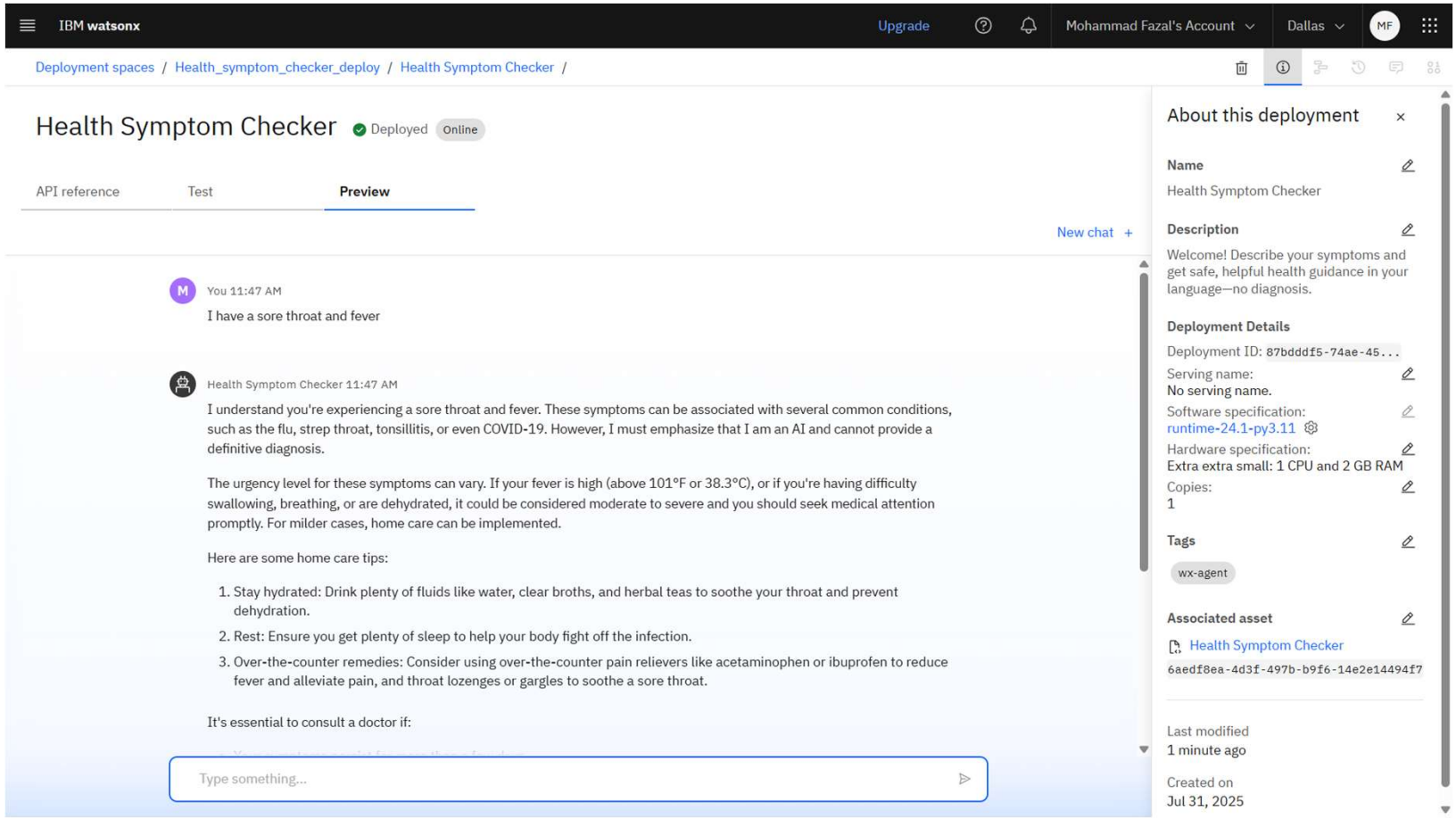
ALGORITHM & DEPLOYMENT

- Algorithms -
  - Transformer-based Large Language Model (LLM)
  - Rule-based mapping or cosine similarity with embeddings
  - LLM-based translation or language detection
  - Prompt-based generation using IBM Granite Instruct Model

- Deployment on IBM Cloud
  - Tool used Watsonx.ai Studio
  - Model used Granite Foundation Model (e.g., granite-13b-instruct)
  - Interface used Deploy model as a managed endpoint with API key
  - IBM Cloud Functions
  - IBM Cloud Object Storage (static site hosting)

RESULT



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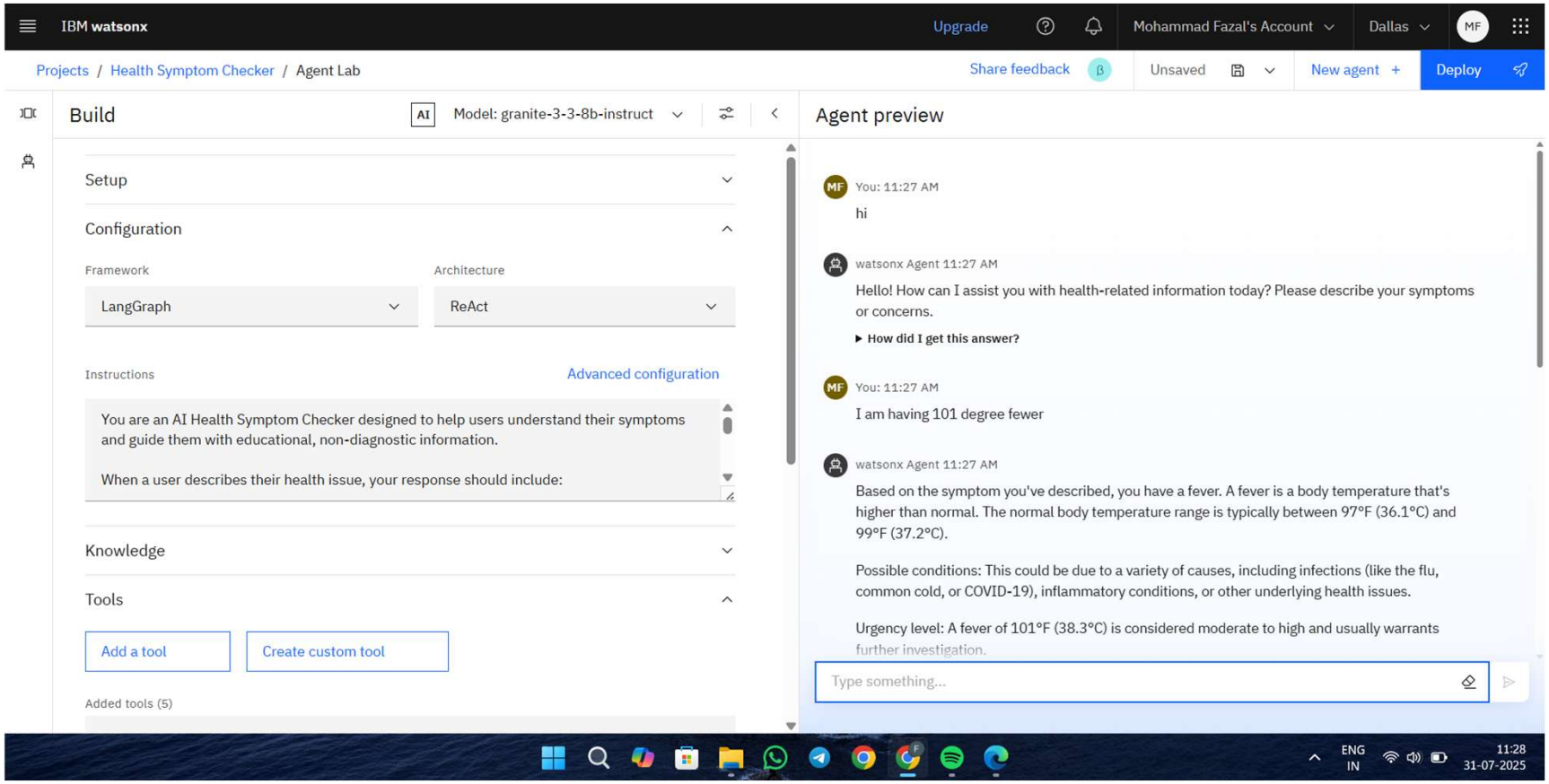
RESULT



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CONCLUSION

- The AI Health Symptom Checker built on IBM Cloud with the Granite Foundation Model successfully interprets user-reported symptoms in natural language, supports multiple languages, and provides educational guidance—including probable causes, urgency levels, home care suggestions, and doctor consultation advice.
- It effectively promotes early awareness, reduces misinformation, and helps users take informed health actions—without attempting self-diagnosis. The use of trusted sources (WHO, CDC) enhances the reliability of responses, while the integration of Watsonx.ai ensures strong language understanding and contextual accuracy.
- Challenges Faced
  - Ensuring the AI avoids medical advice or diagnosis required careful prompt design and response filtering.
  - Multi-language Support: Handling symptom input in non-English languages required fallback translation or multilingual model tuning.
  - Latency: Real-time response performance was sometimes impacted by model size and cloud function cold starts.
  - Symptom Ambiguity: Interpreting vague or overlapping symptoms (e.g., “feeling weak”) posed difficulties without more context.
- AI symptom checkers offer a scalable, accessible, and educational tool to bridge the gap between symptom awareness and professional care—especially in areas with limited medical access. They encourage early health action, reduce panic from misinformation, and support users in managing basic health issues more confidently.

FUTURE SCOPE

- Voice and Chatbot Interface
  - Introduce voice input and conversational UI (via WhatsApp, Telegram, or web chatbots) for better accessibility and real-time interaction, especially for elderly or less tech-savvy users.
- User Personalization
  - Enable optional user profiles that consider factors like age, gender, location, and known medical conditions—leading to more tailored health suggestions while maintaining privacy.
- Mobile Application
  - Develop a cross-platform mobile app (using Flutter or React Native) for wider adoption, offline access to basic health info, and push notifications for health tips.
- Integration with Wearables and Health APIs
  - Connect with devices like smartwatches or fitness bands to monitor vitals (e.g., heart rate, temperature) and enrich symptom analysis in real-time.
- Emergency Detection and Auto-Referral
  - Automatically detect emergency symptoms (like chest pain, difficulty breathing) and redirect users to nearby healthcare providers or emergency services.

REFERENCES

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  - https://www.ibm.com/docs/en/watsonx
- IBM Granite Foundation Models
  - https://www.ibm.com/blog/announcements/granite-model-series
- WHO – International Classification of Diseases (ICD-11)
  - https://icd.who.int/
- Centers for Disease Control and Prevention (CDC) – Symptoms and Self-Care
  - https://www.cdc.gov/
- National Institutes of Health – MedlinePlus: Symptoms
  - https://medlineplus.gov/symptoms.html
- OpenAI – ChatGPT
  - https://chat.openai.com

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