CAPSTONE PROJECT

AGENTIC AI FOR PERSONALIZED COURSE PATHWAYS.

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OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach (Technology Used)
- Process
- Result (Output Image)
- Conclusion
- Future Scope
- References



PROBLEM STATEMENT

Students often struggle to identify the right learning path that aligns with their interests and long-term goals due to the overwhelming number of online courses and a lack of personalized guidance. LearnMate aims to solve this by acting as an Agentic AI coach that interacts with students, understands their interests (like Frontend Development, Cybersecurity, UI/UX Design, etc.), assesses their current skill level, and dynamically builds a personalized course roadmap that adapts over time based on progress and preferences.



PROPOSED SOLUTION

- The proposed system aims to address the challenge of guiding students toward the right learning pathway aligned with their interests and career goals. LearnMate utilizes IBM Watsonx's Agentic AI capabilities to create a dynamic, personalized learning roadmap. The solution includes the following components:
- Agent Design & Configuration:
 - Create a dedicated AI agent using Watsonx Agent Lab (Beta) within IBM Cloud.
 - Configure the agent with tailored instructions to act as a course roadmap mentor.
 - Set interaction tokens to 500 for smooth, multi-turn conversations.
- Instruction-Based Interaction Logic :
 - Provide detailed instructions guiding the agent to:
 - Feature engineering to extract relevant features from the data that might impact bike demand.
 - Collect user inputs
 - Respond with structured, adaptive learning roadmaps
 - Recommend courses, certifications, and tools dynamically
- Dynamic Response Generation: When a user queries the agent:
 - Analyzes input context
 - Builds a multi-phase learning plan
 - Suggests tools, platforms, certifications
 - Follows up with clarification questions to refine guidance
- Deployment:
 - Hosted and executed within the IBM Watsonx.ai platform, eliminating the need for external compute infrastructure.
 - Takes advantage of IBM's Granite models and cloud scalability.
- Continuous Adaptation :
 - Future versions may include:
 - User profile memory or Cloudant integration to track progress
 - Integration with course APIs for live recommendations

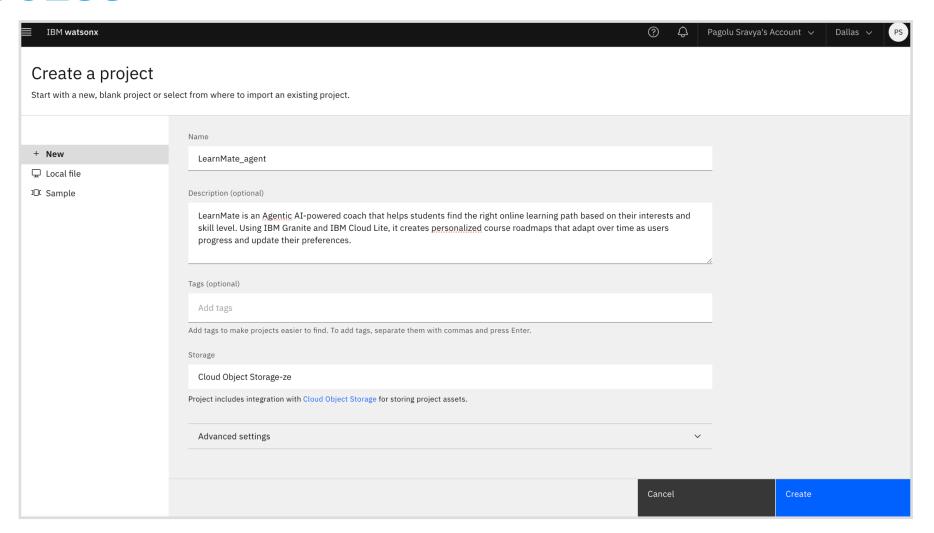


SYSTEM APPROACH

- System requirements :
 - IBM Cloud account
 - Access to Watsonx.ai (Agent Lab Beta)
 - Internet connection and web browser
- Tools Used :
 - Watsonx.ai
 - Agent Lab (Beta)
 - Granite Foundation Models (LLMs)
 - Prompt instructions
- Methodology :
 - Created a project and AI agent in Watsonx.ai
 - Gave custom instructions to act as a course mentor
 - Agent takes user interests & skills, and generates a learning path



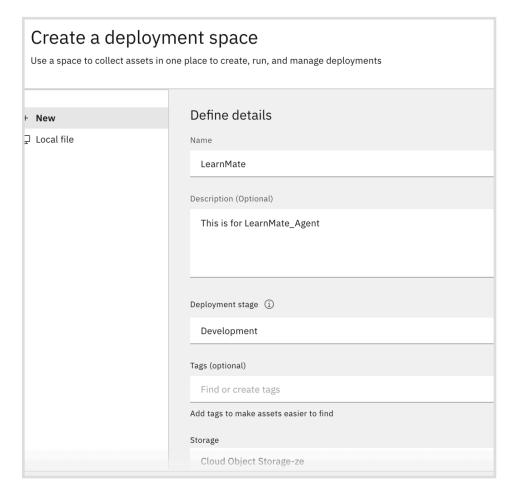
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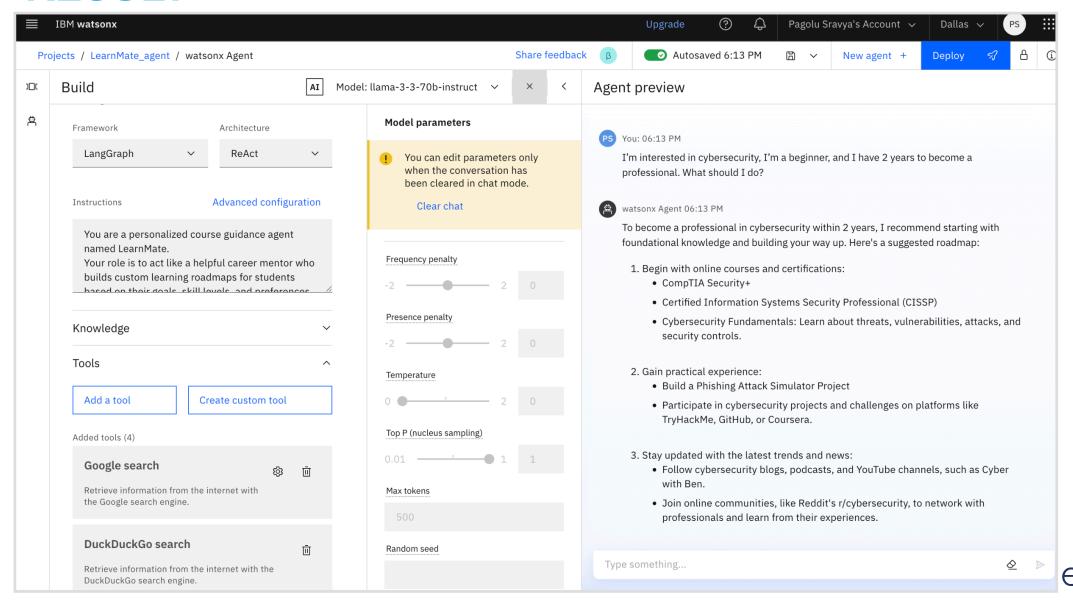


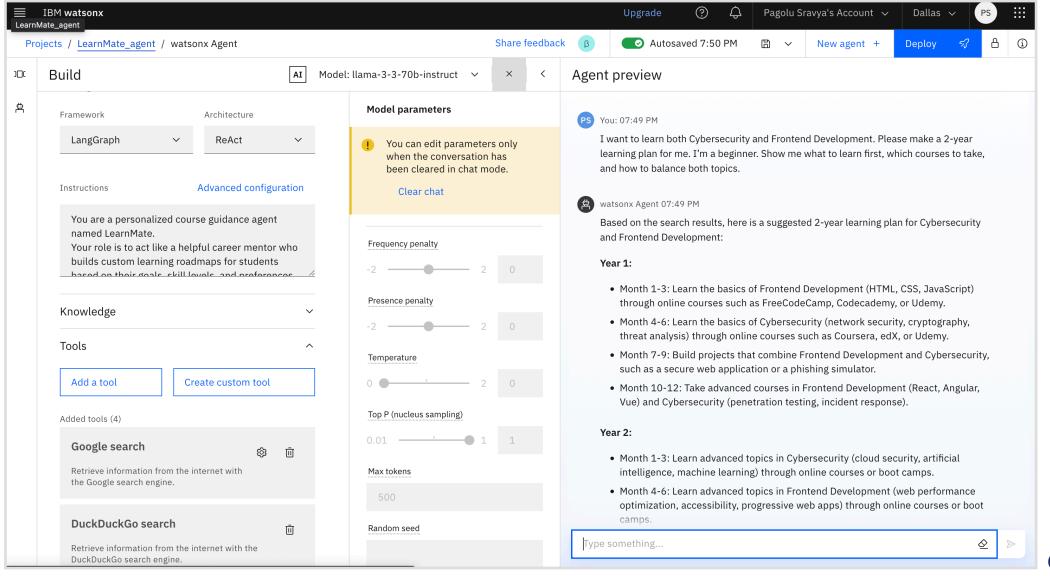
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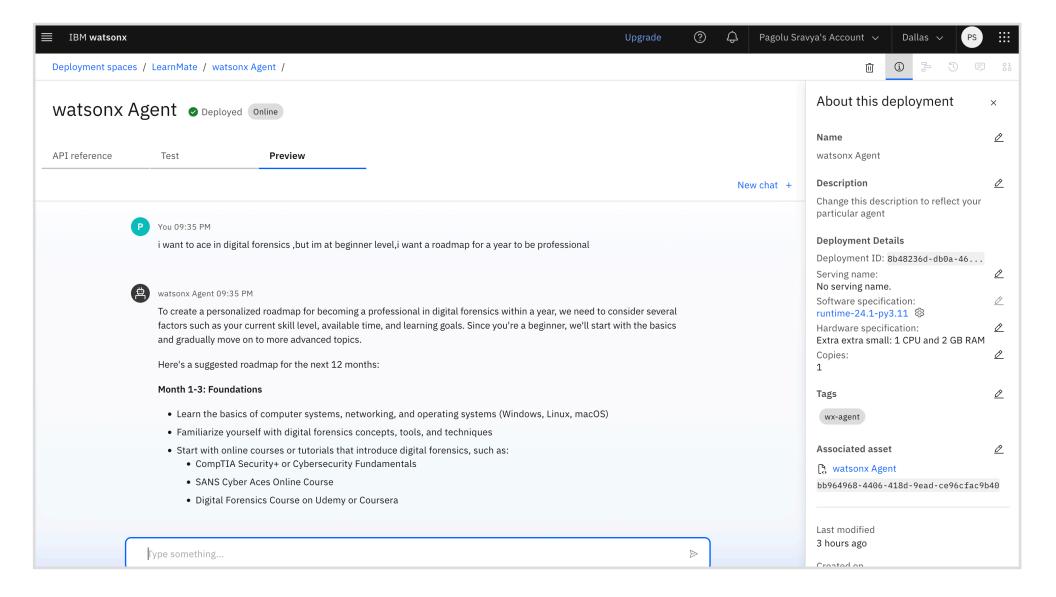






Deployment spaces / LearnMate Overview **Deployments** Jobs Assets Manage ∇ Search Asset Type Tags Last modified Name **Status Asset** type 4 minutes ago watsonx 0 watsonx Agent Online Deployed Ai service wx-agent Agent Pagolu Sravya (You) 4 minutes ago watsonx 0 watsonx Agent Online Deployed Ai service wx-agent Agent Pagolu Sravya (You)







Month 4-6: Digital Forensics Tools and Techniques

- Learn about popular digital forensics tools such as:
 - EnCase
 - FTK (Forensic Toolkit)
 - Volatility
 - Autopsy
- Practice using these tools on virtual machines or sandbox environments
- Study techniques for:
 - Disk imaging and analysis
 - File system analysis
 - Network traffic analysis
 - Malware analysis

Month 7-9: Advanced Topics

- Dive deeper into specialized areas of digital forensics, such as:
 - Mobile device forensics
 - Cloud forensics

- Cloud forensics
- Network forensics
- Reverse engineering
- Learn about industry-standard frameworks and methodologies, such as:
 - NIST Cybersecurity Framework
 - ISO 27037:2012 (Digital forensics)
- Participate in online communities, forums, or social media groups to stay updated on the latest developments and best practices

onth 10-12: Practical Experience and Certification

- Apply your knowledge by working on real-world cases or participating in capture-the-flag (CTF) challenges
- Prepare for professional certifications, such as:
 - Certified Digital Forensics Examiner (CDFE)
 - Certified Forensic Computer Examiner (CFCE)
 - GIAC Certified Forensic Analyst (GCFA)
- Join online platforms, such as HackerRank or Cybrary, to practice and demonstrate your skills



CONCLUSION

■ The LearnMate Agentic AI system effectively addresses the challenge students face in selecting suitable learning paths by providing personalized and adaptive course recommendations. Through interactive prompts and dynamic guidance, the AI coach understands user's interests, evaluates their skill levels, and designs a tailored roadmap that evolves with progress. While implementation using Watsonx Agent Lab was smooth, some limitations were observed in handling very specific or mixed-domain requests, which can be improved with richer datasets and advanced prompt engineering. Overall, LearnMate demonstrates how Agentic AI can transform online learning by offering clarity, personalization, and direction to students navigating vast educational choices.



FUTURE SCOPE

■ The LearnMate AI system can be further enhanced by integrating more user data such as past performance, learning preferences, and goals to improve personalization. Future updates may include support for multiple languages, regional content alignment, and real-time progress tracking. Incorporating advanced technologies like edge computing could help deliver faster and more localized responses. Additionally, integrating more powerful models or plugins may allow LearnMate to provide deeper domain-specific guidance and support across diverse fields such as cybersecurity, frontend development, and more. This expansion could help the system serve a wider audience across cities and educational platforms.



REFERENCES

- IBM watsonx.ai Documentation https://www.ibm.com/docs/en/watsonx
- IBM Cloud Building AI Agents with Agent Lab
- Google AI Responsible AI Practices https://ai.google/responsibilities/
 responsible-ai-practices



IBM CERTIFICATIONS

In recognition of the commitment to achieve professional excellence



Pagolu Sravya

Has successfully satisfied the requirements for:

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Completion Certificate



This certificate is presented to

Pagolu Sravya

for the completion of

Lab: Retrieval Augmented Generation with LangChain

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 24 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU

