

CAPSTONE PROJECT

AI CHAT AGENT ON IBM CLOUD

Presented By:

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SCIENCE (CYBERSECURITY)**

OUTLINE

- Problem Statement
- Technology used
- Wow factor
- End users
- Result
- Conclusion
- Git-hub Link
- Future scope
- IBM Certifications

PROBLEM STATEMENT

Researchers, students, and professionals often struggle to stay updated with the rapidly growing volume of academic publications, technical articles, datasets, and evolving research trends. Manually reviewing, filtering, and synthesizing information across multiple domains is time-consuming and inefficient.

Proposed Solution:

An AI Research Agent that uses Natural Language Processing (NLP), Retrieval-Augmented Generation (RAG), to assist users in conducting efficient literature reviews, generating summaries, identifying research gaps, and recommending relevant papers, datasets, or collaborators.

TECHNOLOGY USED

IBM cloud lite services

Natural Language Processing (NLP)

Retrieval Augmented Generation (RAG)

IBM Granite model

IBM CLOUD SERVICES USED

- IBM Cloud Watsonx AI Studio
- IBM Cloud Watsonx AI runtime
- IBM Cloud Agent Lab
- IBM Granite foundation model

WOW FACTORS

This agent will significantly reduce research time, improve the quality of literature reviews, help early-stage researchers find direction, and foster interdisciplinary collaboration by making knowledge more accessible and actionable.

Unique features:

Semantic search across research papers, journals, and datasets

Auto-summarization of selected papers

Citation and reference analysis to trace influence

Recommendation of research papers based on a user's current topic

Trend analysis over time for specific keywords or domains.




Collaboration mapping: suggests potential co-authors or institutions based on similar research interests.

END USERS



- Academic Researchers
- Research Institutions and Universities
- Industry R&D Teams
- Educators

RESULTS

Projects / Agentic_AI / Agent Lab

Share feedback  Unsaved  New agent + Deploy 

Build

AI Model: mistral-large   <


Instructions

[Advanced configuration](#)

You are a helpful assistant that uses tools to answer questions in detail.
When greeted, say "Hi, I am watsonx.ai agent. How can I help you?"

Knowledge

Vector index

Project template for AI Agent case study 


A vector index searches documents for relevant information to ground the model. Upload the files to index or select an existing index.

Tools

Add a tool

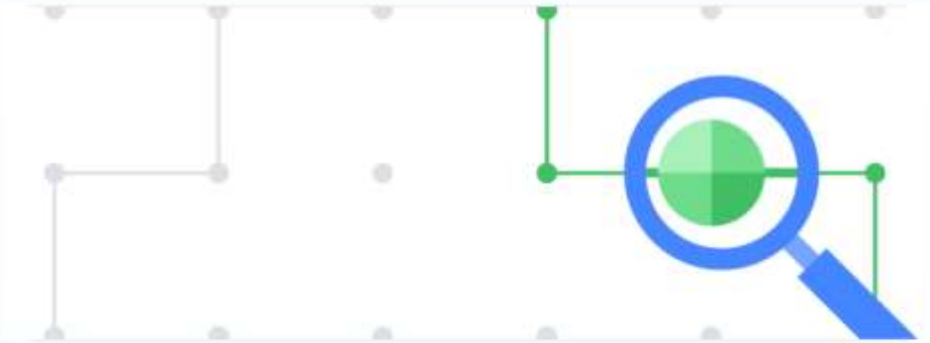
Create custom tool



Agent preview

 watsonx Agent 11:00 AM

Welcome to watsonx Agent

Change this description to reflect your particular agent



Type something...  

RESULTS

The screenshot displays the IBM watsonx Agent Lab interface, divided into two main panels: 'Build' and 'Agent preview'.

Build Panel:

- Setup:** Includes 'Configuration' and 'Instructions' sections.
- Configuration:** Features dropdowns for 'Framework' (set to 'LangGraph') and 'Architecture' (set to 'ReAct').
- Instructions:** A text box containing the instruction: "You are a helpful assistant that uses tools to answer questions in detail. When greeted, say 'Hi, I am watsonxai agent. How can I help you?'". A link for 'Advanced configuration' is visible.
- Knowledge:** Includes a 'Vector index' section with a dropdown menu showing 'Project template for AI Agent case study'. A note below states: "If you want to add a vector index to the agent, select the agent provider (RAG)". A 'Clear chat' link is also present.
- Tools:** Features buttons for 'Add a tool' and 'Create custom tool'. Below, under 'Added tools (2)', a 'Google search' tool is listed with the description: "Retrieve information from the internet with the Google search engine."

Agent preview Panel:

- watsonx Agent 11:01 AM:** The header for the preview section.
- Summary:** Contains a 'Problem Statement' (Researchers, students, and professionals often struggle to stay updated with the rapidly growing volume of academic publications, technical articles, datasets, and evolving research trends. Manually reviewing, filtering, and synthesizing information across multiple domains is time-consuming and inefficient.) and a 'Proposed Solution' (An AI Research Agent that uses Natural Language Processing (NLP), Retrieval-Augmented Generation (RAG), to assist users in conducting efficient literature reviews, generating summaries, identifying research gaps, and recommending relevant papers, datasets, or collaborators).
- Technology Used:** A bulleted list including: IBM Cloud Lite Services, Natural Language Processing (NLP), Retrieval Augmented Generation (RAG), and IBM Granite Model.
- Wow Factors:** A bulleted list including: Significantly reduces research time, Improves the quality of literature reviews, Helps early-stage researchers find direction, and Fosters interdisciplinary collaboration by making knowledge more accessible and actionable.
- Unique Features:** A bulleted list including: Semantic search across research papers, journals, and datasets; Auto-summarization of selected papers; Citation and reference analysis to trace influence; Recommendation of research papers based on a user's current topic; Trend analysis over time for specific keywords or domains; and Collaboration mapping: suggests potential co-authors or institutions based on similar research interests.

The interface also includes a top navigation bar with 'IBM watsonx', 'Projects / Agentic_AI / Agent Lab', and user account information. A bottom bar shows 'Share feedback', 'Unsaved', 'New agent +', and a 'Deploy' button.

RESULTS

The screenshot displays the IBM watsonx Agent Lab interface. The top navigation bar includes the IBM watsonx logo, an 'Upgrade' button, a user profile for 'Piyush Kumar Sahoo's Acc...', a location dropdown for 'London', and a 'PS' indicator. Below the navigation bar, the breadcrumb trail shows 'Projects / Agentic_AI / Agent Lab'. The main interface is divided into two panels: 'Build' on the left and 'Agent preview' on the right.

Build Panel:

- Model:** mistral-large
- Framework:** LangGraph
- Architecture:** ReAct
- Instructions:** You are a helpful assistant that uses tools to answer questions in detail. When greeted, say "Hi, I am watsonx.ai agent. How can I help you?"
- Knowledge:** Project template for AI Agent case study
- Tools:** Google search (Retrieves information from the internet with the Google search engine.)

Agent preview Panel:

- Summary:**
 - Problem Statement:** Researchers, students, and professionals often struggle to stay updated with the rapidly growing volume of academic publications, technical articles, datasets, and evolving research trends. Manually reviewing, filtering, and synthesizing information across multiple domains is time-consuming and inefficient.
 - Proposed Solution:** An AI Research Agent that uses Natural Language Processing (NLP), Retrieval-Augmented Generation (RAG), to assist users in conducting efficient literature reviews, generating summaries, identifying research gaps, and recommending relevant papers, datasets, or collaborators.
 - Technology Used:**
 - IBM Cloud Lite Services
 - Natural Language Processing (NLP)
 - Retrieval Augmented Generation (RAG)
 - IBM Granite Model
 - Wow Factors:**
 - Significantly reduces research time
 - Improves the quality of literature reviews
 - Helps early-stage researchers find direction
 - Fosters interdisciplinary collaboration by making knowledge more accessible and actionable
 - Unique Features:**
 - Semantic search across research papers, journals, and datasets
 - Auto-summarization of selected papers
 - Citation and reference analysis to trace influence
 - Recommendation of research papers based on a user's current topic

RESULTS

Deployed AI Agent

The screenshot displays the IBM watsonx Agent deployment interface. The top navigation bar includes the IBM watsonx logo, an 'Upgrade' button, and user information for 'Piyush Kumar Sahoo's Acc...' in 'London'. The main content area shows the 'watsonx Agent' deployment status as 'Deployed' and 'Online'. Below this, there are tabs for 'API reference', 'Test', and 'Preview', with 'Preview' being the active tab. A 'New chat' button is visible on the right. The chat interface shows a user query at 11:30 AM: 'WHAT IS CYBERSECURITY?'. The watsonx Agent responds at 11:30 AM with a detailed definition of cybersecurity, its importance, and various types of threats. A 'How did I get this answer?' link is provided below the response. The right sidebar, titled 'About this deployment', contains details such as Name (watsonx Agent), Description (Change this description to reflect your particular agent), Deployment Details (Deployment ID: a6d5bba3-c15e-47..., 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 (cc-agent), Associated asset (watsonx Agent), Last modified (1 minute ago), and Created on (Aug 3, 2025).

IBM watsonx Upgrade Piyush Kumar Sahoo's Acc... London

Deployment spaces / AI CHAT AGENT / watsonx Agent

watsonx Agent Deployed Online

API reference Test **Preview** [New chat](#)

WHAT IS CYBERSECURITY?

Cybersecurity is the practice of protecting computer systems, networks, and data from unauthorized access or malicious attacks. It involves a combination of technologies, processes, and policies to prevent, detect, and respond to cyber threats. Cybersecurity is important because it helps to protect sensitive information, prevent financial loss, and maintain the integrity of computer systems and networks. There are various types of cybersecurity, including network security, application security, data security, and endpoint security. Additionally, there are different types of cyber threats, such as malware, phishing, and ransomware, that can compromise the security of computer systems and data.

[How did I get this answer?](#)

Type something...

About this deployment

Name
watsonx Agent

Description
Change this description to reflect your particular agent.

Deployment Details
Deployment ID: a6d5bba3-c15e-47...
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
cc-agent

Associated asset
watsonx Agent

Last modified: 1 minute ago
Created on: Aug 3, 2025

CONCLUSION

- The agent can generate reports, suggest hypotheses, and even draft sections of research papers.
- It saves time by automating repetitive tasks like citation management and data extraction.
- Research Agents enhance efficiency, accuracy, and innovation in both academic and industrial R&D.

FUTURE SCOPE

- Multilingual Research Support
- Voice-Activated Research Assistant
- Real-Time Collaboration Features
- Research Gap and Novel Topic Identification
- Integration with Publishing Platforms
- AI-Assisted Paper Drafting

IBM CERTIFICATIONS

- Screenshot/ credly certificate(getting started with AI)

In recognition of the commitment to achieve
professional excellence



Piyush kumar Sahoo

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 19, 2025

Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/946805e8-4c7e-4e0e-9599-a382fa27b230>



IBM CERTIFICATIONS

- Screenshot/ credly certificate(Journey to Cloud)

In recognition of the commitment to achieve
professional excellence



Piyush kumar Sahoo

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 19, 2025

Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/b5fd08cc-dbae-4a22-961c-fb67febbd584>



Attach your RAG LAB certificate here



GITHUB LINK

- Git hub link : <https://github.com/theconsoler/AI-CHAT-AGENT->



THANK YOU