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# IBM AICTE PROJECT

## RESEARCH AGENT

**Presented By:**

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# OUTLINE

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

# PROBLEM STATEMENT

- **Problem:**
- Academics, students, and professionals face challenges in staying updated with the growing number of academic publications, technical articles, datasets, and evolving research trends.
- Manually reviewing, filtering, and analyzing information across multiple disciplines is time-consuming and inefficient.
- **Proposed Solution:**
- Develop an AI-powered Research Assistant equipped with Natural Language Processing (NLP) and Retrieval-Augmented Generation (RAG).
- Key functionalities of the tool:
  - Conduct efficient literature reviews.
  - Generate concise summaries of research papers and articles.
  - Identify gaps in existing research.
  - Recommend relevant papers, datasets, or potential collaborators.

# TECHNOLOGY USED

- **Technologies Used:**
- **IBM Cloud Lite Services:** Provides scalable and reliable cloud infrastructure for hosting and managing the AI assistant.
- **Natural Language Processing (NLP):** Enables the system to understand, analyze, and interpret human language for summarization and recommendations.
- **Retrieval-Augmented Generation (RAG):** Combines retrieval of relevant information with AI-generated insights to enhance accuracy and relevance.
- **IBM Granite Model:** A cutting-edge AI model by IBM, designed to power intelligent systems with advanced capabilities in understanding and generating text.

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## IBM CLOUD SERVICES USED

- **IBM Cloud Watsonx AI Studio:** Enables the creation and training of AI models tailored for research tasks.
- **IBM Cloud Watsonx AI Runtime:** Provides the runtime environment to deploy and manage AI models effectively.
- **IBM Cloud Agent Lab:** Facilitates the development and testing of intelligent agents.
- **IBM Granite Foundation Model:** A robust AI model designed to power advanced NLP capabilities for the agent.

# WOW FACTORS

- **Semantic Search:** Enables context-aware search across research papers, journals, and datasets.
- **Auto-Summarization:** Automatically generates concise summaries of selected research papers.
- **Citation and Reference Analysis:** Traces the influence and connections of research through citation mapping.
- **Personalized Recommendations:** Suggests relevant research papers based on the user's current topic or interest.
- **Trend Analysis:** Tracks the evolution of specific keywords or research domains over time.
- **Collaboration Mapping:** Identifies potential co-authors or institutions with similar research interests.

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## END USERS

- **Academic Researchers:** To streamline their research and enhance productivity.
- **Research Institutions and Universities:** To support faculty and students in conducting efficient research.
- **Industry R&D Teams:** To accelerate innovation and product development.
- **Educators:** To access and summarize the latest research for teaching purposes.

# RESULTS

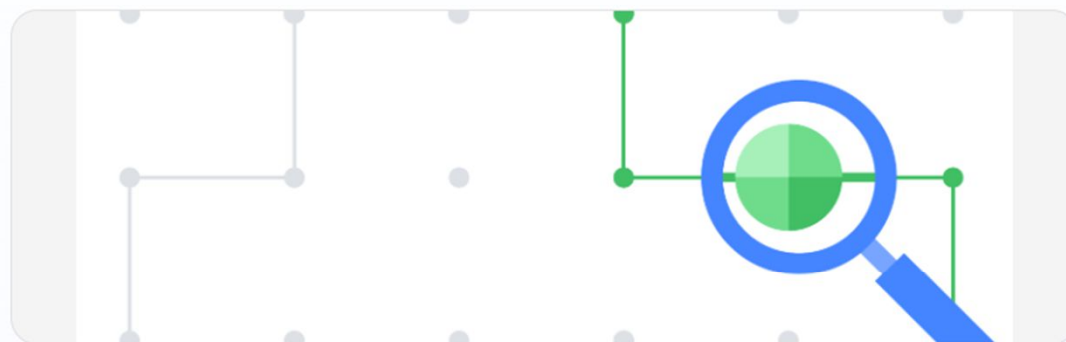
## Agent preview



Research Agent 02:54 PM

### Welcome to Research Agent

The agent can generate reports, suggest hypotheses, and even draft sections of research papers.



Type something...





# RESULTS

## Agent preview



You: 02:55 PM

Show me recent research on artificial intelligence.



Research Agent 02:55 PM

Here are some recent research articles and news on artificial intelligence:

1. **MIT News:** In a new study, researchers discover the root cause of a type of bias in LLMs, paving the way for more accurate and reliable AI systems. [Read more](#)
2. **arXiv:** Harnessing AI Agents to Advance Research on Refugee Child Mental Health. [Read more](#)
3. **Stanford HAI:** News on how artificial intelligence improves patient care and expands research capacity. [Read more](#)
4. **Journal of Artificial Intelligence Research:** Current Issue on machine learning, natural language, planning and scheduling, robotics and vision, and uncertainty in AI. [Read more](#)
5. **ScienceDaily:** A team of researchers has shown that even small-scale quantum computers can enhance machine learning performance. [Read more](#)
6. **McKinsey:** The latest McKinsey Global Survey on AI finds that organizations are beginning to take steps that drive bottom-line impact. [Read more](#)
7. **Apple Machine Learning Research:** Overview of the latest advancements in machine learning and artificial intelligence. [Read more](#)

Type something...



# RESULTS

## Agent preview



You: 02:56 PM

Help me write an introduction for a paper on electric vehicles.



Research Agent 02:56 PM

Here are some recent research articles and news on artificial intelligence:

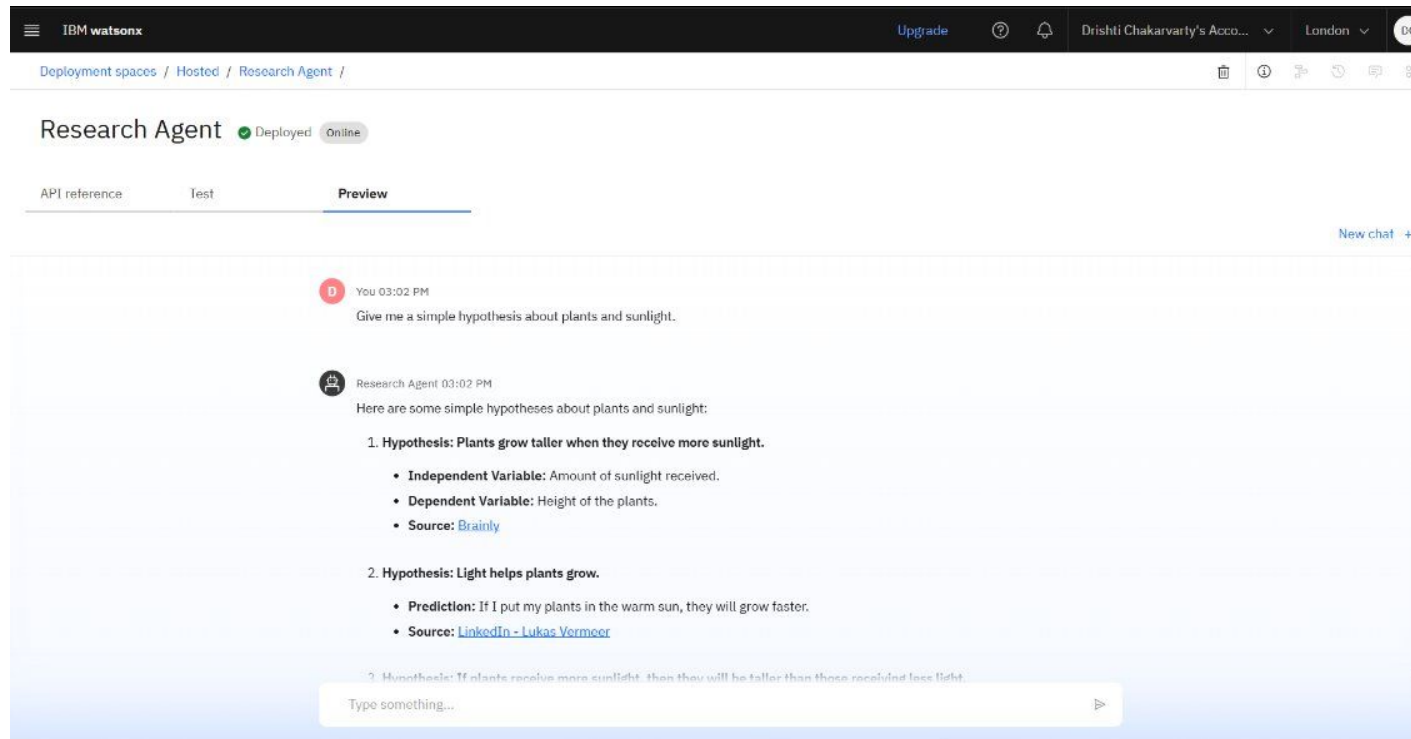
1. **MIT News:** In a new study, researchers discover the root cause of a type of bias in LLMs, paving the way for more accurate and reliable AI systems. [Read more](#)
2. **arXiv:** Harnessing AI Agents to Advance Research on Refugee Child Mental Health. [Read more](#)
3. **Stanford HAI:** News on how artificial intelligence improves patient care and expands research capacity. [Read more](#)
4. **Journal of Artificial Intelligence Research:** Current Issue on machine learning, natural language, planning and scheduling, robotics and vision, and uncertainty in AI. [Read more](#)
5. **ScienceDaily:** A team of researchers has shown that even small-scale quantum computers can enhance machine learning performance. [Read more](#)
6. **McKinsey:** The latest McKinsey Global Survey on AI finds that organizations are beginning to take steps that drive bottom-line impact. [Read more](#)
7. **Apple Machine Learning Research:** Overview of the latest advancements in machine learning and artificial intelligence. [Read more](#)

Type something...



# RESULTS

## Deployed AI Agent



The screenshot displays the IBM watsonx interface for a deployed AI agent named "Research Agent". The agent is shown as "Deployed" and "Online". The "Preview" tab is active, showing a chat history. The user asks: "Give me a simple hypothesis about plants and sunlight." The Research Agent responds with two hypotheses:

- Hypothesis: Plants grow taller when they receive more sunlight.**
  - Independent Variable: Amount of sunlight received.
  - Dependent Variable: Height of the plants.
  - Source: [Brainly](#)
- Hypothesis: Light helps plants grow.**
  - Prediction: If I put my plants in the warm sun, they will grow faster.
  - Source: [LinkedIn - Lukas Vermeer](#)

The chat history also shows a third hypothesis: "Hypothesis: If plants receive more sunlight, then they will be taller than those receiving less light." The input field at the bottom contains the text "Type something..." and a send button.

# BENEFITS

- **Time-Saving:** Automates repetitive tasks like citation management and data extraction.
- **Enhanced Research Output:** Generates reports, suggests hypotheses, and drafts sections of research papers.
- **Increased Efficiency:** Improves accuracy and innovation in both academic and industrial R&D.

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# CONCLUSION

- Research agents like this enhance efficiency, accuracy, and innovation, making them indispensable tools for modern research.
- By automating tedious tasks and providing actionable insights, the agent empowers users to focus on high-value activities.

## GITHUB LINK

- Make sure that there should be readme file
- [https://github.com/CodeCraftsman-6/AICTE\\_IBM\\_AI\\_CLOUD\\_RESEARCH\\_AGENT\\_PROJECT.git](https://github.com/CodeCraftsman-6/AICTE_IBM_AI_CLOUD_RESEARCH_AGENT_PROJECT.git)

# FUTURE SCOPE

- **Multilingual Research Support:** Expands accessibility for non-English researchers.
- **Voice-Activated Research Assistant:** Provides hands-free interaction for users.
- **Real-Time Collaboration Features:** Enables teams to work together seamlessly on research projects.
- **Research Gap and Novel Topic Identification:** Highlights unexplored areas and emerging trends.
- **Integration with Publishing Platforms:** Simplifies the process of preparing and submitting research papers.
- **AI-Assisted Paper Drafting:** Helps draft sections of research papers with minimal manual effort.

## IBM CERTIFICATIONS

# Getting Started with Artificial Intelligence

IBM **SkillsBuild**

- Screenshot/ credly certificate( getting started with AI)



IBM





**THANK YOU**