
CAPSTONE PROJECT

LIBRARY AI AGENT

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OUTLINE

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

PROBLEM STATEMENT

Library staff spend a significant amount of time on repetitive, manual tasks like inventory checks, shelving misplaced items, and answering routine questions about hours or book availability. This administrative burden detracts from their ability to provide high-quality, personalized service and curate community programs.

PROPOSED SOLUTION

Library staff spend a significant amount of time on repetitive, manual tasks like inventory checks, shelving misplaced items, and answering routine questions about hours or book availability. This administrative burden detracts from their ability to provide high-quality, personalized service and curate community programs.

SYSTEM APPROACH

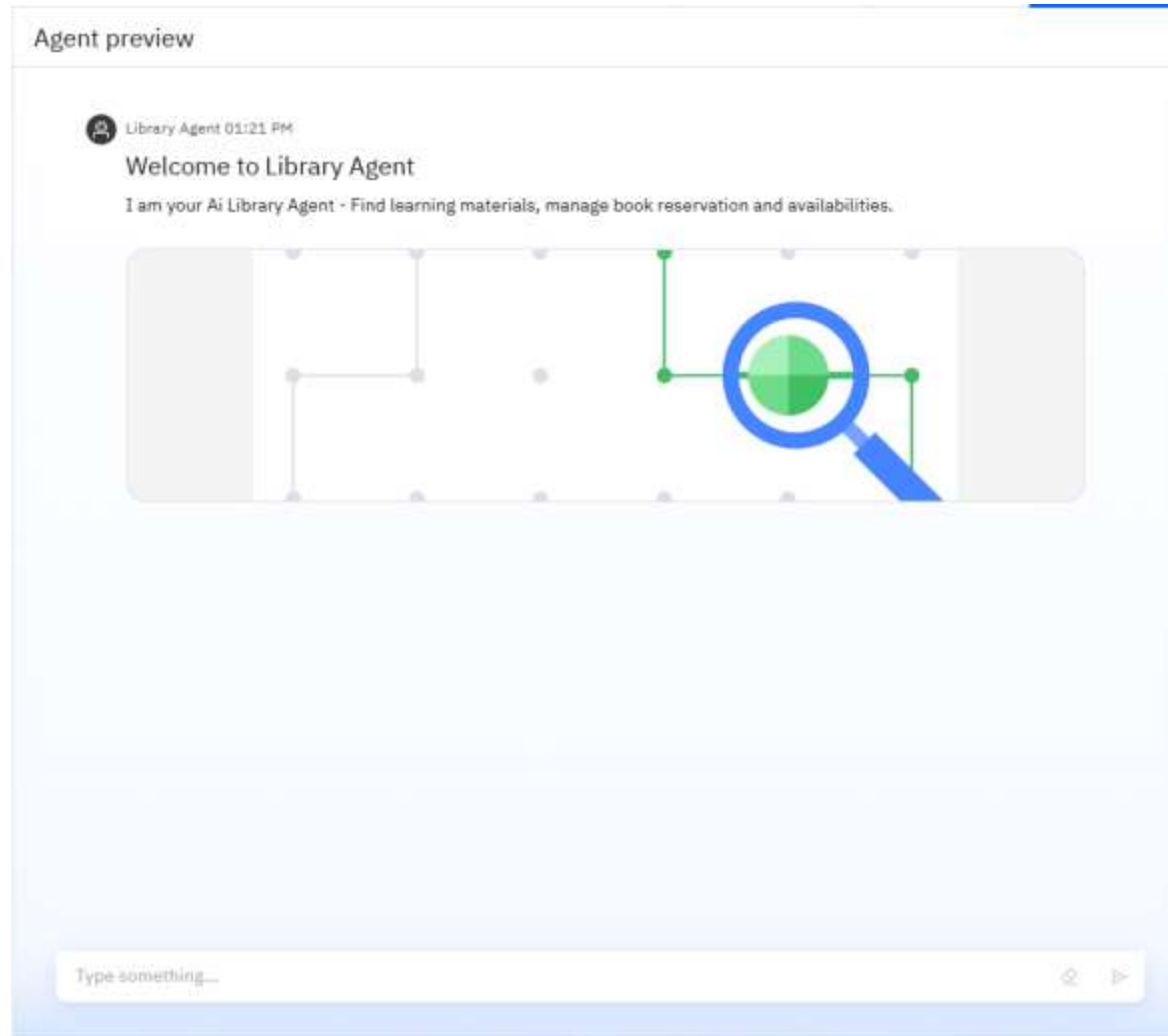
- **Technology Used:**

- IBM cloud lite services
- Natural Language Processing (NLP)
- IBM Granite model

- **Cloud Services used:**

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

RESULT



RESULT

Agent preview



You: 01:21 PM

What are some good books you can recommend



Library Agent 01:21 PM

I'd be happy to help with that! To provide the best recommendations, could you please tell me about your interests or the subject of your research? For example, are you looking for books on a specific topic, or do you prefer certain genres or authors?

► How did I get this answer?



You: 01:21 PM

thriller, action genre based books



Library Agent 01:21 PM

Great! Here are some highly-rated thriller and action books available in our library:

1. "The Martian" by Andy Weir - A gripping tale of survival and human ingenuity on Mars.
2. "Gone Girl" by Gillian Flynn - A psychological thriller about a wife's disappearance and the dark secrets within a marriage.
3. "Six Years" by Harlan Coben - A suspenseful story about a photographer who discovers a picture from six years in the future.
4. "The Da Vinci Code" by Dan Brown - A thrilling mystery combining art, history, and religion.
5. "The Bourne Identity" by Robert Ludlum - The first in a series about a man with amnesia who uncovers his past as a highly-trained assassin.

All of these books are currently available. Would you like help with reserving any of them or accessing them digitally?

► How did I get this answer?



Type something...



Agent preview

All of these books are currently available. Would you like help with reserving any of them or accessing them digitally?

► How did I get this answer?



You: 01:22 PM

what about self help



Library Agent 01:22 PM

Certainly! Here are some well-regarded self-help books in our collection:

1. "Atomic Habits" by James Clear - This book provides practical strategies for forming good habits, breaking bad ones, and mastering the tiny behaviors that lead to remarkable results.
2. "The Power of Now" by Eckhart Tolle - A guide to spiritual enlightenment that emphasizes the importance of living in the present moment.
3. "Daring Greatly" by Brené Brown - This book explores the concept of vulnerability and how embracing it can lead to a more fulfilling life.
4. "Mindset: The New Psychology of Success" by Carol S. Dweck - Dweck explains how our beliefs about our abilities can impact our success, and how adopting a 'growth mindset' can lead to personal and professional growth.
5. "The 7 Habits of Highly Effective People" by Stephen R. Covey - A time-tested guide to personal and professional effectiveness, based on the principle of fairness and reciprocity.

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► How did I get this answer?



RESULT

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:** Shows 'Framework' set to 'LangGraph' and 'Architecture' set to 'ReAct'.
- Instructions:** Contains a text box with the following text: "Core Behaviors & Functions: Understand and Clarify: When a student provides a query, use natural language processing (NLP) to understand their request. If the query is ambiguous, ask clarifying questions to narrow down their academic needs (e.g., 'Are you looking for an introductory text or a specialized journal article on that topic?')."
- Knowledge:** Includes a 'vector index' section with a 'Select or create vector index' dropdown and a 'Clear chat' button.
- Tools:** Features buttons for 'Add a tool' and 'Create custom tool'.
- Added tools (1):** Lists 'Google search' with the description 'Retrieve information from the internet with the Google search engine.'

Agent preview Panel:

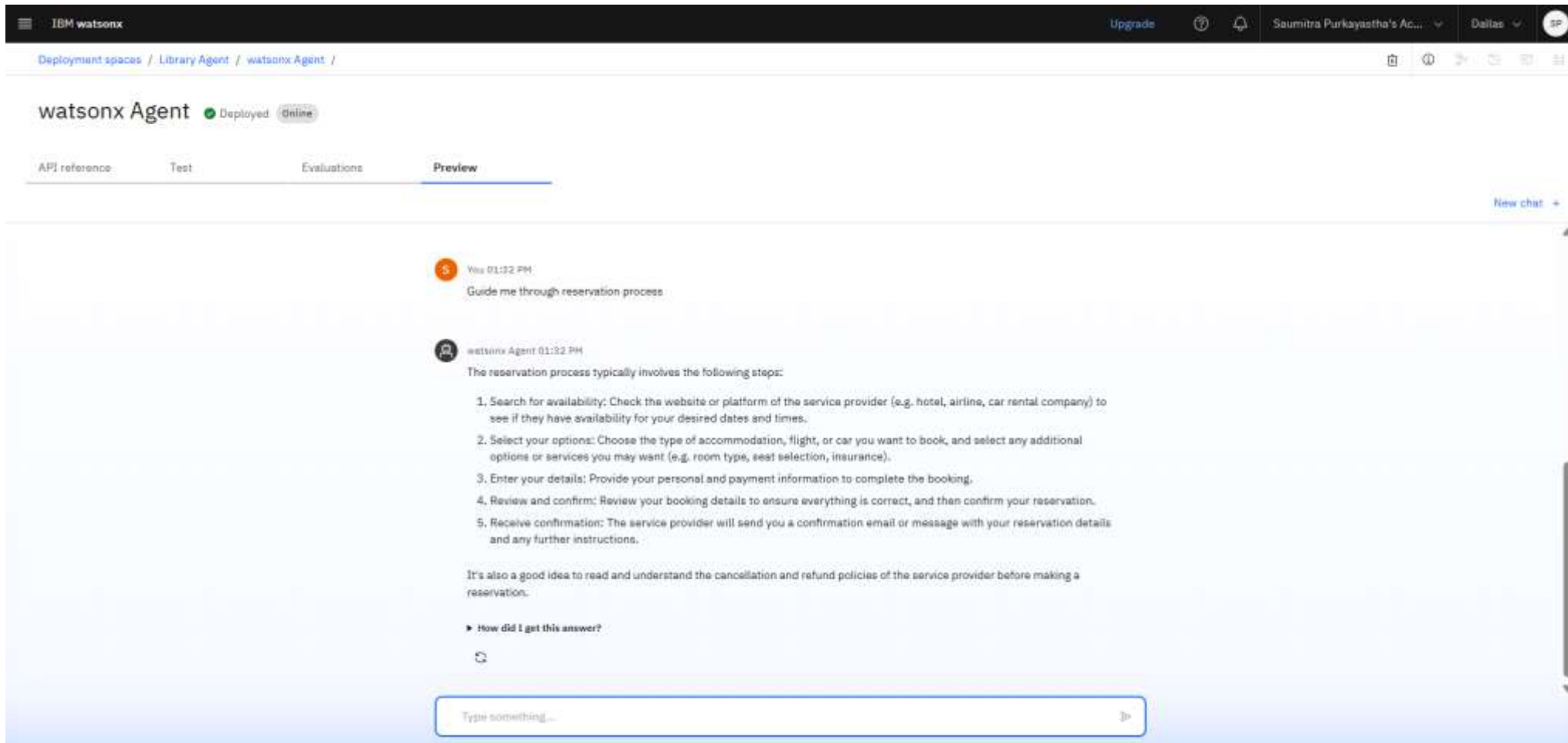
- User:** "You: 01:21 PM" - "What are some good books you can recommend."
- Library Agent:** "01:21 PM" - "I'd be happy to help with that! To provide the best recommendations, could you please tell me about your interests or the subject of your research? For example, are you looking for books on a specific topic, or do you prefer certain genres or authors?"
- User:** "You: 01:21 PM" - "thriller,action genre based books"
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The interface also includes a top navigation bar with 'IBM watsonx', 'Projects / Library Agent / Agent Lab', and buttons for 'Upgrade', 'Share feedback', 'Unkaved', 'New agent', and 'Deploy'.

RESULT

Deployed Agent



The screenshot displays the IBM watsonx Agent management console. At the top, a navigation bar includes the 'IBM watsonx' logo, an 'Upgrade' button, and user information for 'Saumitra Purkayastha's Account' in the 'Dallas' region. Below this, a breadcrumb trail shows the path: 'Deployment spaces / Library Agent / watsonx Agent /'. The main header identifies the 'watsonx Agent' as 'Deployed' and 'Online'. A horizontal menu contains tabs for 'API reference', 'Test', 'Evaluations', and 'Preview', with the 'Preview' tab currently selected. The preview area shows a chat interface with a 'New chat +' button in the top right. The chat history includes a user message from 'You' at 01:32 PM asking to be guided through the reservation process, and a response from the 'watsonx Agent' at the same time. The agent's response provides a five-step guide for the reservation process. At the bottom of the chat window is a text input field with the placeholder 'Type something...' and a send button.

IBM watsonx Upgrade Saumitra Purkayastha's Account Dallas SP

Deployment spaces / Library Agent / watsonx Agent /

watsonx Agent Deployed Online

API reference Test Evaluations **Preview**

New chat +

You 01:32 PM
Guide me through reservation process

watsonx Agent 01:32 PM
The reservation process typically involves the following steps:

1. Search for availability: Check the website or platform of the service provider (e.g. hotel, airline, car rental company) to see if they have availability for your desired dates and times.
2. Select your options: Choose the type of accommodation, flight, or car you want to book, and select any additional options or services you may want (e.g. room type, seat selection, insurance).
3. Enter your details: Provide your personal and payment information to complete the booking.
4. Review and confirm: Review your booking details to ensure everything is correct, and then confirm your reservation.
5. Receive confirmation: The service provider will send you a confirmation email or message with your reservation details and any further instructions.

It's also a good idea to read and understand the cancellation and refund policies of the service provider before making a reservation.

► How did I get this answer?

Type something...

RESULT

Deployed Agent

The screenshot displays the IBM Watsonx Agent interface. At the top, the header shows 'IBM watsonx' and navigation links for 'Deployment spaces', 'Library Agent', and 'watsonx Agent'. The agent's name 'watsonx Agent' is shown with a green 'Deployed' status and a blue 'Online' label. Below the agent name, there are tabs for 'API reference', 'Test', 'Evaluations', and 'Preview'. A 'New chat' button is visible on the right. The chat history shows a user asking 'Can you provide sites to read books?' and the agent responding with a list of 9 websites for reading books online. The agent's response is as follows:

You can find sites to read books on the following websites:

1. Open Library (openlibrary.org) - a digital library that offers over 3 million books for borrowing and reading.
2. Epic (getepic.com) - a digital library that provides access to over 40,000 kids' books and other reading materials.
3. Goodreads (goodreads.com) - a social networking site for book lovers that allows you to find and read books, as well as connect with other readers.
4. Project Gutenberg (gutenberg.org) - a digital library that offers over 60,000 free e-books, mostly classics.
5. ReadAnyBook (readanybook.com) - an online library that allows you to read books for free, with a collection of over 500,000 titles.
6. Bookshare (bookshare.org) - a digital library that provides access to books for people with reading barriers, such as dyslexia or blindness.
7. BookSub (booksub.com) - a website that offers deals on bestselling e-books, with discounts of up to 95% off.
8. Reach Out and Read (reachoutandread.org) - a non-profit organization that promotes early literacy and provides access to books for children.
9. Storyline Online (storylineonline.net) - a website that features actors reading children's books aloud, with the goal of inspiring a love of reading in children.

These websites offer a range of options for reading books online, from free e-books to subscription-based services, and can be a great resource for book lovers of all ages.

How did I get this answer?

Type something...

CONCLUSION

- **Smarter Resource Access:** It uses AI and natural language processing to move beyond simple searches, intelligently recommending highly relevant materials tailored to a student's specific academic needs and course syllabi.
- **Enhanced Student Experience:** The system transforms the library into an active, personalized partner in a student's research, ensuring they efficiently find and use the best resources available.
- **Future-Proofing Libraries:** This project helps libraries transition from being static resource repositories to dynamic, data-driven hubs that are fully integrated into the modern educational landscape.

FUTURE SCOPE

- **Integration with Library Accounts:** Allow the agent to perform actions on behalf of the user, such as checking their borrowing history, notifying them of due dates, and renewing books (with proper user authentication).
- **Community-Driven Curation:** Develop a feature where the agent can analyze what books are frequently cited in student papers (anonymously) and what resources are most often reserved. This data can be used to suggest "popular" or "highly cited" resources to other students and help librarians make data-driven purchasing decisions.
- **Interactive Research Guides:** The agent could create personalized research guides on demand. A student could ask, "How do I start a research paper on machine learning?" and the agent would generate a step-by-step guide with relevant resources, citation tools, and tutorials.
- **Syllabus Analysis & Proactive Alerts:** The agent could proactively analyze uploaded syllabi and send students alerts about upcoming readings and due dates for resources they will need to check out from the library.

REFERENCES

- IBM Skills Build Classes and Videos
- Geeks for Geeks
- IEEE Explore
- Science Direct

GITHUB LINK

- Github Link: <https://github.com/Saumitra-171/intern.git>

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Saumitra Purkayastha

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 20, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/70cfba34-6e4c-499c-bd85-82a1767e9e65>



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IBM **SkillsBuild**

Completion Certificate



This certificate is presented to
Saumitra Purkayastha

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