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# **CAPSTONE PROJECT**

## **AI AGENT FOR NBA ACCREDITATION PROCESS**

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## OUTLINE

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- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **System Workflow**
- **Deployment on IBM watsonx**
- **Result (Output Image)**
- **Conclusion**
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# PROBLEM STATEMENT

- An AI agent designed to assist faculty with NBA accreditation processes using RAG (Retrieval-Augmented Generation).
- It retrieves relevant NBA criteria, formats, and past documentation from internal and external sources. Faculty can query the agent for guidance on SAR preparation, CO-PO mapping, and documentation. The RAG model ensures up-to-date and context-aware responses, grounded in trusted data. It reduces manual effort, ensures consistency, and speeds up accreditation readiness. This intelligent assistant supports continuous improvement and compliance with NBA standards.

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# PROPOSED SOLUTION

The proposed system addresses the challenges faculty face during NBA accreditation by introducing a Retrieval-Augmented Generation (RAG)-based AI assistant, hosted on IBM Watsonx. The solution simplifies SAR preparation, CO-PO mapping, and compliance documentation by offering intelligent, real-time assistance through a user-friendly chat interface.

- **Document Collection & Indexing:**
  - Gather internal documents such as past SARs, CO-PO matrices, rubrics, and assessment reports.
  - Collect official NBA criteria and formatting guidelines from the NBA website.
  - Index all documents using a vector database or Watson Discovery for fast and accurate retrieval.
- **Data Preprocessing:**
  - Clean and structure unformatted documents (PDFs, DOCs).
  - Segment documents by criteria and sections (e.g., Criterion 1–10).
  - Convert content into embeddings for semantic search.
- **AI Model & RAG Architecture:**
  - Use LangGraph + ReAct for agent orchestration and logical flow.
  - Implement IBM Granite LLM for generating grounded, document-based answers.
  - Enable Retrieval-Augmented Generation (RAG) to combine relevant document chunks with generative response.
  - Agent provides responses with contextual references and suggested templates.
- **Deployment:**
  - Deploy on IBM Cloud Lite using scalable and serverless architecture.
  - Integrate IBM Object Storage, Granite APIs, and vector index backend.
- **Evaluation & Feedback Loop:**
  - Review AI responses with faculty validation.
  - Use feedback to refine prompts, update document index, and improve model accuracy.

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# SYSTEM DEVELOPMENT APPROACH

The system uses:

- - IBM Watsonx (LangGraph + ReAct)
- - IBM Granite LLM for responses
- - Vector Index of NBA documents
- - Retrieval-Augmented Generation pipeline
- - Web chat interface for faculty queries

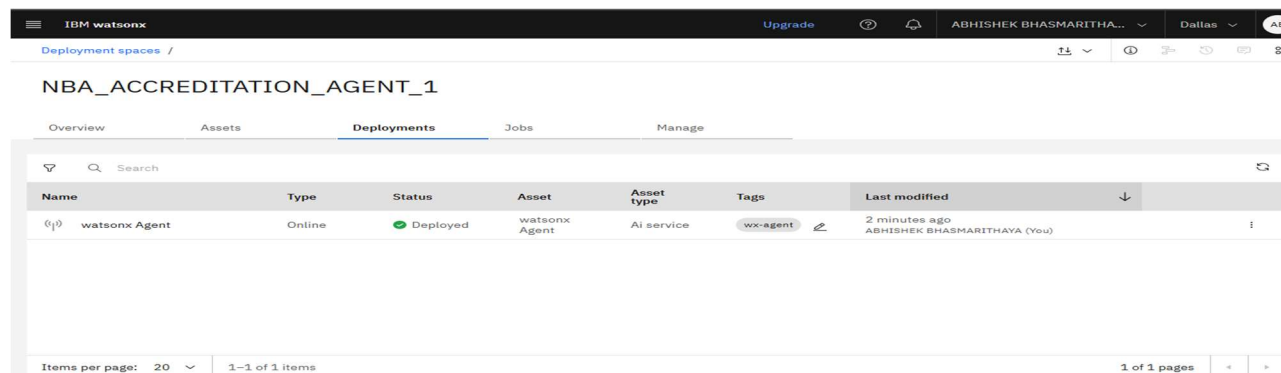
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# SYSTEM WORKFLOW

- Collect NBA criteria, past SARs, CO-PO documents
- Store documents in IBM Object Storage
- Index using Watson Discovery / custom vector database
- Use LangGraph + ReAct for orchestration
- Granite model for generating grounded responses

# DEPLOYMENT ON IBM WATSONX

- The agent is deployed using IBM Watsonx:
- - Model: mistral-large
- - Framework: LangGraph
- - Architecture: ReAct
- - Instructions and document vector index configured
- - Live chat interface provides document-based answers



The screenshot shows the IBM Watsonx Deployment Spaces interface. The top navigation bar includes the IBM Watsonx logo, an 'Upgrade' button, and user information for 'ABHISHEK BHASMARITHA...'. The main heading is 'NBA\_ACCREDITATION\_AGENT\_1'. Below this, there are tabs for 'Overview', 'Assets', 'Deployments', 'Jobs', and 'Manage'. The 'Deployments' tab is active, displaying a table with deployment details.

Name	Type	Status	Asset	Asset type	Tags	Last modified
Watsonx Agent	Online	Deployed	watsonx Agent	AI service	wx-agent	2 minutes ago ABHISHEK BHASMARITHAYA (You)

At the bottom, there is a pagination bar showing 'Items per page: 20' and '1-1 of 1 items'.

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# RESULT

- - Successfully deployed RAG-based assistant
- - Faculty queries answered with document-specific data
- - Reduced manual effort in SAR preparation
- - Screenshots show live interaction with agent



# INSTRUCTIONS GIVEN TO AGENT AI

Agent Lab (beta) — Docs | IBM x Agent Lab — NBA\_ACCREDITA x +

datapatform.cloud.ibm.com/wx/agents?context=wx&project\_id=02d9812d-dd7d-4090-908d-4250deb67d16

IBM watsonx Upgrade ? ABHISHEK BHASMARITHA... Dallas AB

Projects / NBA\_ACCREDITATION\_AGENT / Agent Lab Share feedback Unsaved New agent + Deploy

### Advanced configuration

**Agent instructions** Common instructions

Agent instructions are unique to this agent and will affect its specific behavior. [Reset to default](#)

You are an AI agent designed to assist faculty with NBA accreditation processes using RAG you want to retrieves relevant NBA criteria, formats, and past documentation from internal and external sources. Faculty can query the agent for guidance on SAR preparation, CO-PO mapping, and documentation. The RAG model ensures up-to-date and context-aware responses, grounded in trusted data. It reduces manual effort, ensures consistency, and speeds up accreditation readiness. you should be a intelligent assistant supports continuous improvement and compliance with NBA standards.

Cancel Apply

Search

10:51 PM 03-08-2025

# PROMPTS/QUESTIONS AND OUTPUTS

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 'ABHISHEK BHASMARITHA...', and location settings for 'Dallas'. The main header shows the project path: 'Projects / NBA\_ACCREDITATION\_AGENT / Agent Lab'. Below this, there are buttons for 'Share feedback', 'Unsaved', 'New agent +', and 'Deploy'.

The interface is divided into two main sections: 'Build' and 'Agent preview'.

**Build Section:**

- Model:** mistral-large
- Added tools (5):**
  - Google search:** Retrieve information from the internet with the Google search engine.
  - DuckDuckGo search:** Retrieve information from the internet with the DuckDuckGo search engine.
  - Wikipedia search:** Retrieve information from Wikipedia articles.
  - Document search - Sample\_SAR\_ECE+:** Search documents with vector indexes.
  - Webcrawler:** Retrieve information from a website.

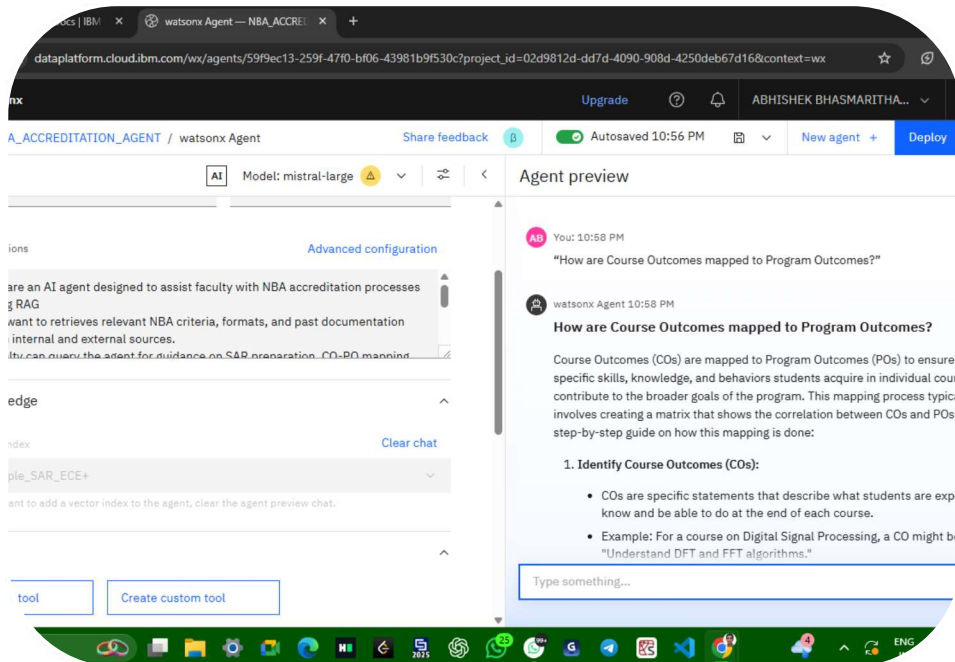
**Agent preview Section:**

The agent's response to the prompt 'what are the stages of nba accreditation process' is displayed. The response states: 'The NBA accreditation process involves several stages to ensure that educational programs meet the required standards. Here are the key stages:'

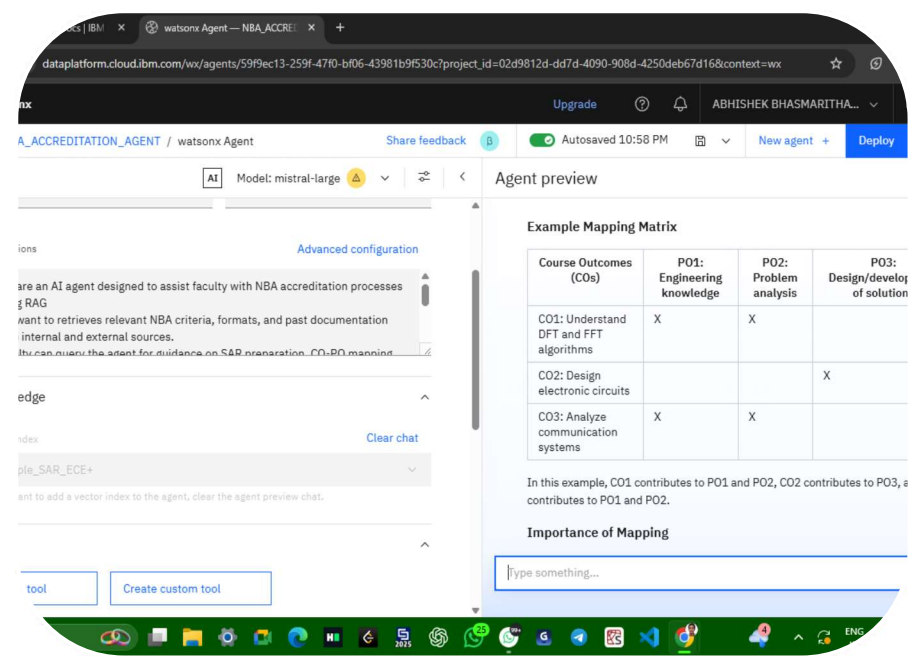
- 1. Pre-Assessment Stage:**
  - Application for Accreditation:** Registered institutions can apply online for the accreditation of their programs by the NBA. This involves logging into the eNBA portal and submitting the necessary documents.
- 2. Self-Assessment Report (SAR) Preparation:**
  - Institutions prepare a comprehensive Self-Assessment Report (SAR) that outlines their programs, facilities, faculty, and other relevant information. This report is crucial for the evaluation process.

At the bottom of the preview, there is a text input field with the placeholder 'Type something...' and a send button.

# PROMPTS/QUESTIONS AND OUTPUTS



Question 2:How course outcomes mapped to program outcomes



output

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# CONCLUSION

The AI assistant helps faculty by simplifying and accelerating NBA documentation. It provides accurate, reliable guidance from institutional data using IBM Watsonx, RAG architecture, and Granite LLMs. It promotes readiness, standardization, and quality compliance.

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## FUTURE SCOPE

- Add NAAC and ABET support
- Integrate voice queries and ERP systems
- Provide real-time documentation completion analytics
- Expand to support multi-department and multi-institute use

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# REFERENCES

- Rajkumar, Sreepadapu & Polasa, Swathi. (2021). An Overview of Application for N.B.A Accreditation to Diploma Level Polytechnic Institutions in India and Advantages. IARJSET. 8. 10.17148/IARJSET.2021.8916.
- Panda, Meethun. (2025). Agentic RAG Redefining Retrieval-Augmented Generation for Adaptive Intelligence.

## IBM CERTIFICATIONS



## IBM CERTIFICATIONS

In recognition of the commitment to achieve  
professional excellence



**ABHISHEK B**

Has successfully satisfied the requirements for:

**Journey to Cloud: Envisioning Your Solution**



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

Verify: <https://www.credly.com/badges/7f0e0970-f090-4cf0-9a27-7212a68da775>





## IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

**ABHISHEK B**

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

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**THANK YOU**