CAPSTONE PROJECT

An AI agent designed to assist faculty with NBA accreditation processes (RAG Based)

Presented By:

Hafsa Y

NSS College Of Engineering,Palakkad

Electronics And Communication

edunet
foundation

OUTLINE

- **Problem Statement** (Should not include solution)
- **Proposed System/Solution**
- **System Development Approach** (Technology Used)
- **Algorithm & Deployment**
- **Result (Output Image)**
- **Conclusion**
- **Future Scope**
- **References**

edunet
foundation

Problem Statement

- Faculty often struggle with the repetitive, document-heavy NBA accreditation process.
- Tasks like SAR preparation, CO-PO mapping, and compliance tracking demand time and precision.

Challenge:

- Create an AI agent that assists faculty with NBA accreditation using RAG — retrieving accurate information from guidelines, formats, and past documents to answer queries effectively.

Proposed Solution

Develop a RAG-based AI agent capable of:

- Answering faculty queries related to NBA standards

- Retrieving NBA guidelines, templates, formats from trusted sources

- Assisting with:

    - SAR (Self-Assessment Report) drafting

    - CO-PO mapping strategies

    - Documentation processes

    - NBA terminology clarification

Benefits:

- Context-aware, reliable responses

- Reduced manual effort

- Improved documentation quality and consistency

- Faster NBA readiness

edunet
foundation

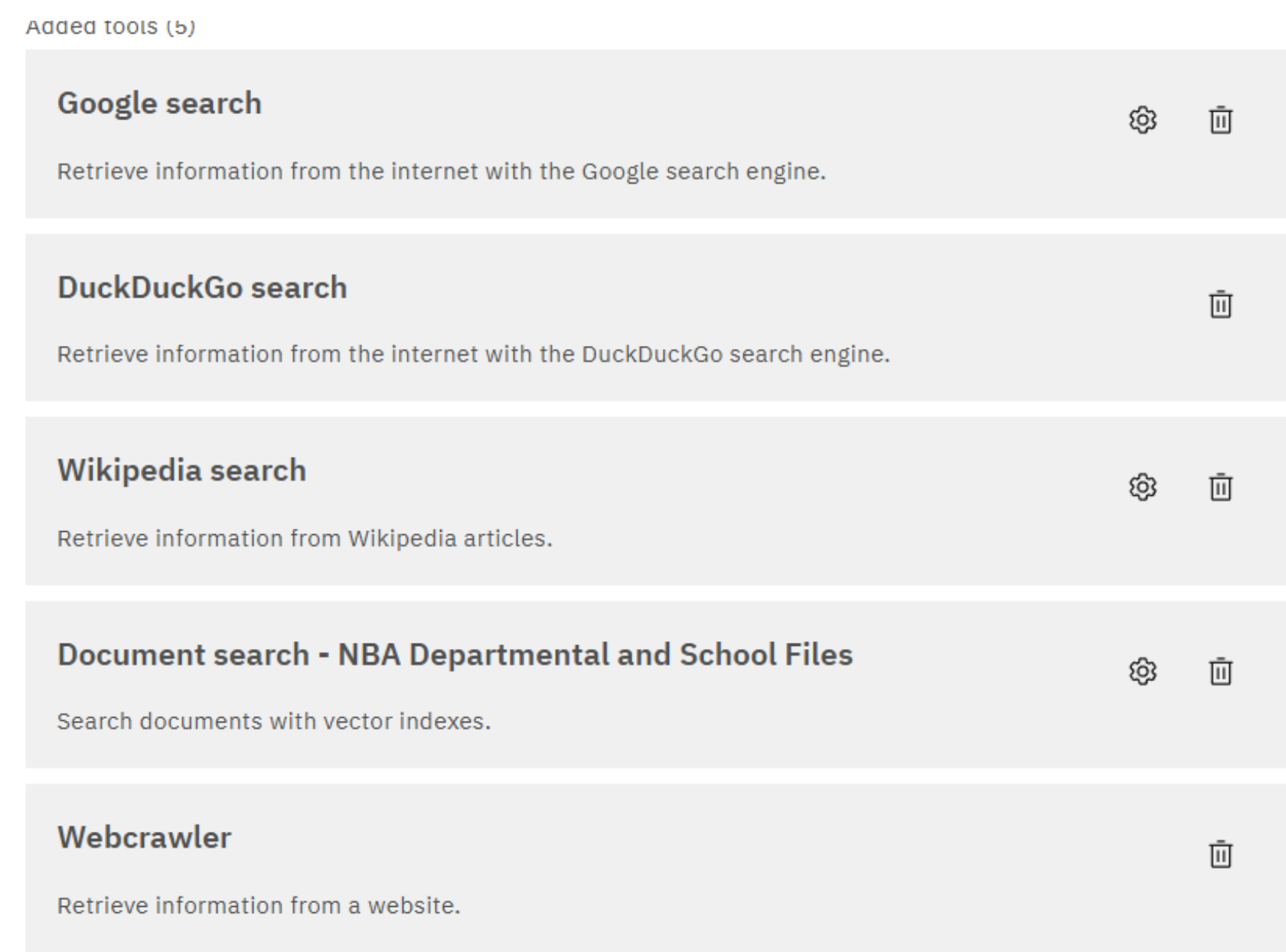# System Approach

- **Technology Stack:**
    - IBM Cloud Lite Services
    - IBM Granite foundation models
    - Vector store (for document embeddings)
    - RAG (Retrieval-Augmented Generation) pipeline
    - LangChain (optional) or IBM watsonx tools

- **Data Sources:**
    - NBA official criteria PDFs
    - SAR formats and guidelines
    - Internal sample reports
    - Previous NBA evaluations

Foundation Model:

- Model Name: granite-3-3-8b-instruct
- Type: Instruction-tuned decoder-only LLM
- Provider: IBM
- Integrated via: IBM watsonx.ai → Agent or Prompt Lab

- This screenshot shows the added tools for your RAG-based AI agent — including web and document retrieval utilities like:

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 - NBA Departmental and School Files

Search documents with vector indexes.

Webcrawler

Retrieve information from a website.

- Document Vectorization – Uploading SAR Files for Retrieval

Ground gen AI with vectorized documents

Add documents to vectorize and create a vector index in memory. Otherwise, select your vector database and specify index details.

Vector stores

- **In memory**
- watsonx.data Milvus
- **Es** Elasticsearch

Add files

Drop data files or browse to upload

Add PPTX, DOCX, PDF, or TXT files or select from project.

Add up to 300 MB with PPTX files, 50 MB of PDF files, 50 MB of DOCX files, or 5 MB with TXT and other files.

| Browse | Select from project |

Sample_SAR_ECE.docx
37.4KB

Define details

Name

Sample_SAR_ECE

Description (optional)

What's the purpose of this vector index?

Advanced settings ⌄

Cancel   Create

Algorithm & Deployment

RAG Workflow:

1. Document Ingestion: Embed PDF, DOCX, and web sources
2. Retrieval: Use similarity search from vector DB
3. Granite Model Querying: Provide context-aware answers grounded in retrieved chunks
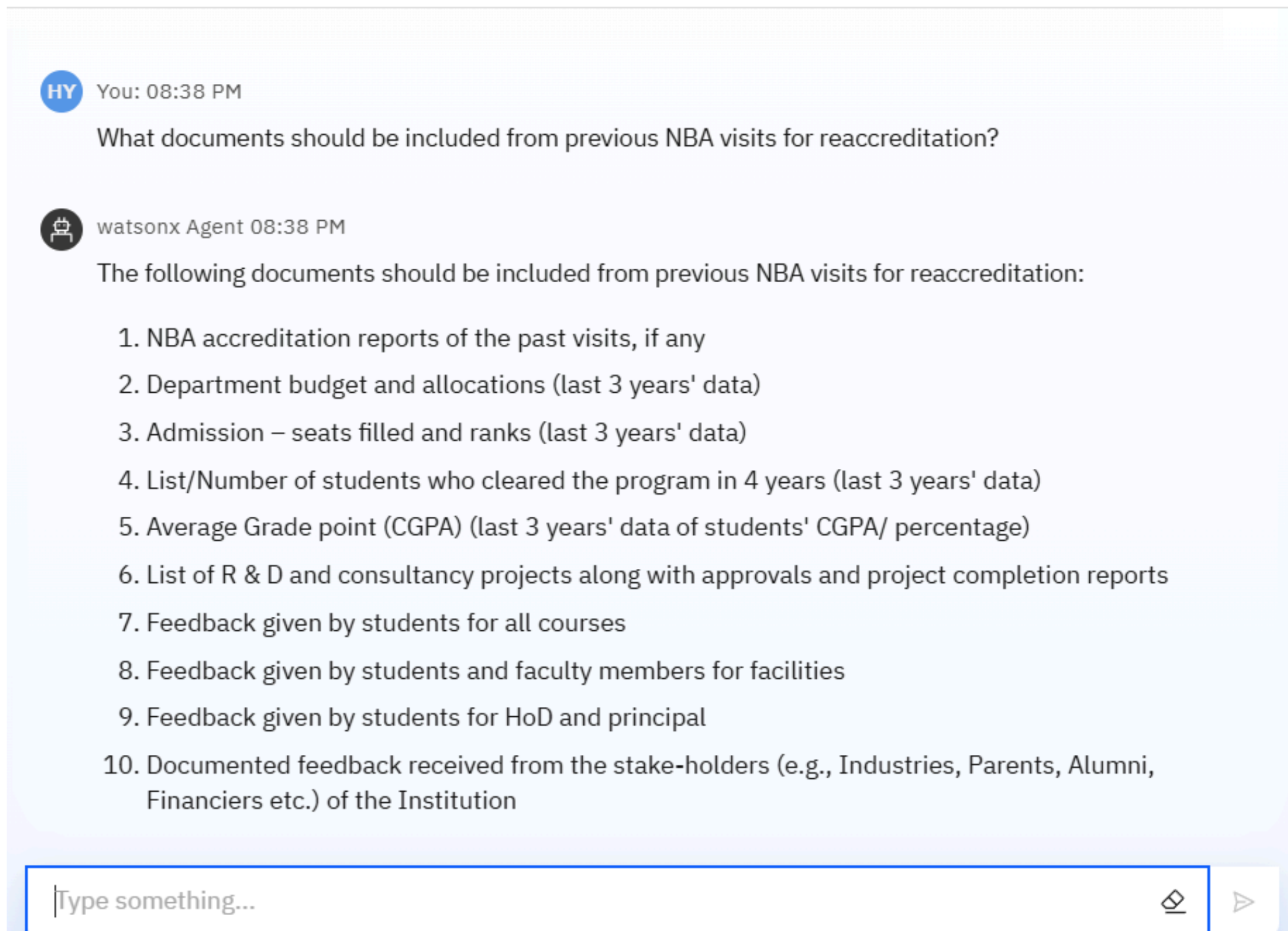4. Post-Processing: Format output for faculty use (e.g., SAR suggestions)

Deployment:

- Built within IBM watsonx.ai
- Accessible via Web UI / Agent
- Secure document access, private vector DB

edunet
foundation

Result

The AI agent, powered by the granite-3-3-8b-instruct model and integrated with a RAG pipeline, was queried about NBA reaccreditation document requirements. The result below showcases its context-aware, document-grounded response.

Agent preview

HY You: 08:38 PM

What documents should be included from previous NBA visits for reaccreditation?

watsonx Agent 08:38 PM

The following documents should be included from previous NBA visits for reaccreditation:

1. NBA accreditation reports of the past visits, if any
2. Department budget and allocations (last 3 years' data)
3. Admission – seats filled and ranks (last 3 years' data)
4. List/Number of students who cleared the program in 4 years (last 3 years' data)
5. Average Grade point (CGPA) (last 3 years' data of students' CGPA/ percentage)
6. List of R & D and consultancy projects along with approvals and project completion reports
7. Feedback given by students for all courses
8. Feedback given by students and faculty members for facilities
9. Feedback given by students for HoD and principal
10. Documented feedback received from the stake-holders (e.g., Industries, Parents, Alumni, Financiers etc.) of the Institution

Type something...

edunet
foundation

Share feedback β

Autosaved 9:12 PM

New agent +

Deploy

Build

AI Model: granite-3-3-8b-instruct ⌄

Setup ⌄

Configuration ⌃

Framework

LangGraph ⌄

Architecture

ReAct ⌄

Instructions

Advanced configuration

You are an AI Assistant trained to help faculty members with the NBA (National Board of Accreditation) accreditation process. Your responses must be based on official NBA documentation and previously uploaded SAR samples.

Your responsibilities:

Knowledge ⌄

Tools ⌃

Add a tool

Create custom tool

Agent preview

ⓘ **Deployment has started**
Your AI service deployment has started.

View status

Timestamp 9:04:08 PM

HY You: 09:13 PM

How is student outcome attainment measured as per N

watsonx Agent 09:13 PM

According to the NBA documentation, student outcome attainment is measured through the Program Outcomes (PO) and the Professional Outcomes (PSO).

Program Outcomes (PO) are the broad skills and knowledge that all students in a program are expected to acquire. These are typically assessed by common methods such as internships, capstone projects, standardized tests, or other forms of assessment.

Professional Outcomes (PSO) are more specific outcomes that prepare graduates for entry into the profession or for advanced study. These are often measured through employment rates, salaries, further education, and professional licensure or certification rates.

The NBA requires institutions to demonstrate that their graduates have achieved these outcomes at rates comparable to or exceeding those of graduates from similar programs. This is typically done through the Self-Study Report (SAR), where institutions provide evidence of student learning outcomes, graduate performance in the workplace, and other relevant data.

For detailed information, please refer to the NBA Criteria Document, specifically Criteria 6: Student

Type something...

Conclusion

This RAG-based AI assistant simplifies the NBA accreditation process by:

- Providing reliable, document-grounded guidance

- Enhancing faculty productivity and confidence

- Promoting documentation consistency and compliance

The system helps institutions achieve and maintain NBA standards effectively.

Future scope

This RAG-based AI assistant simplifies the NBA accreditation process by:
- Providing reliable, document-grounded guidance
- Enhancing faculty productivity and confidence
- Promoting documentation consistency and compliance

The system helps institutions achieve and maintain NBA standards effectively.

edunet
foundation

References

-IBM Watsonx.ai Documentation

- IBM Granite Model Info

- Open Source RAG Architecture (LangChain, Haystack)

- ChatGPT Conversation Support.

IBM Certifications

IBM Certifications

IBM **SkillsBuild**   Completion Certificate

This certificate is presented to

Hafsa Y

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