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# IBM AICTE PROJECT

## AI AGENT FOR DIGITAL FINANCIAL LITERACY

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# OUTLINE

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# PROBLEM STATEMENT

- Many individuals, especially from rural or less digitally aware communities, face challenges in understanding digital financial tools such as UPI, online banking, loan procedures, or scam prevention. Lack of awareness leads to financial mismanagement, fraud risks, and exclusion from government schemes

# PROPOSED SOLUTION

## Data Collection:

- Collect verified financial literacy content from RBI, NPCI, bank FAQs, and government portals.
- Ingest via scraping/APIs and store in IBM Cloud Object Storage (Lite) with metadata.

## Data Preprocessing:

- Clean, deduplicate, translate, and chunk documents into 200–800 token segments.
- Generate embeddings using IBM Granite embeddings via watsonx.ai and index in a vector DB.

## Machine Learning Algorithm:

- Use a lightweight intent classifier for query categorization and entity extraction.
- Apply Granite LLM with Retrieval-Augmented Generation (RAG) for accurate, sourced answers.

## Deployment:

- Deploy backend API and Granite model integration on IBM Code Engine (Lite) with a simple web UI.

## Result:

- Deliver  $\geq 80\%$  helpful, multilingual responses for digital finance education and scam awareness.
- Improve user confidence and reduce reliance on manual support channels.

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# SYSTEM APPROACH

- IBM cloud lite services
- IBM Watsonx.ai Studio
- IBM Granite Foundation Model (LLM) ■
- Natural Language Processing (NLP)
- Vector Index (Watsonx.ai)
- Retrieval Augmented Generation (RAG)

# ALGORITHM & DEPLOYMENT

- Connect to watsonx.ai on IBM Cloud and select the Granite foundation model.
- Ingest banking, UPI, and loan documents into the system. Preprocess and chunk documents into small, searchable sections.
- Create embeddings for each chunk using Granite embedding models.
- Store embeddings in a vector database (Milvus via watsonx.data).
- Receive user query from watsonx Assistant.
- Convert query to embeddings and retrieve top-matching chunks from vector DB.
- Build a prompt combining retrieved chunks with system instructions.
- Use Granite LLM to generate a grounded, safe, and cited answer.
- Send response back to watsonx Assistant and log interaction for monitoring.

# WOW FACTORS

- This AI agent aims to empower users with accurate, accessible, and personalized financial knowledge.
- It will reduce misinformation, help users make better money decisions, and increase trust in digital financial systems.
- The solution is especially impactful for underserved communities and first-time digital users.

## Unique features:

- Retrieval-based answers from trusted sources like RBI and NPCI
- Natural Language Processing (NLP) for understanding diverse user queries
- Document-based responses using a Vector Index (RAG implementation)
- Safe handling of off-topic or unrelated questions
- Designed for multilingual interaction to reach regional users
- Covers essential topics like UPI, online scams, loans, budgeting, and saving

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# END USERS

- General Public
- First-time Digital Users
- Elderly Citizens
- Students and Young Adults
- NGOs and Government Outreach Programs
- Self-Help Groups / Women's Collectives
- Educators / Institutions
- Microfinance Beneficiaries



# RESULT

The screenshot displays the IBM watsonx Agent web interface. The browser address bar shows the URL: `dataplatform.cloud.ibm.com/wx/agents/409154b1-49af-49fd-ab9e-f74c86f90488?project_id=4d014a59-b45a-46f8-8a54-29ba84048385&context=wx`. The interface is divided into two main panels: 'Build' on the left and 'Agent preview' on the right.

**Build Panel:**

- Model:** granite-3-3-8b-instruct
- 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?"  
1. Build Trust and Understand the Client
- Knowledge:** (Empty section)
- Tools:** (Empty section with buttons: Add a tool, Create custom tool)
- Added tools (4):** (Empty list)

**Agent preview Panel:**

- Message 1 (User):** Hi, I am watsonx.ai agent. How can I help you today?  
How did I get this answer?
- Message 2 (User):** You: 11:23 AM  
I need 1 month budget plan
- Message 3 (Agent):** watsonx Agent 11:23 AM  
Sure, I can help you create a basic budget plan using the 50-30-20 rule, which suggests allocating your income as follows:
  - 50% for Needs (housing, utilities, groceries, transportation, etc.)
  - 30% for Wants (dining out, entertainment, hobbies, etc.)
  - 20% for Savings and Debt RepaymentTo create a more personalized plan, I would need to know your monthly income and a list of your regular expenses. Could you provide that information?
- Message 4 (Agent):** Also, I recommend tracking your expenses to ensure you're staying within these categories. There are many budgeting apps available that can help with this.
- Message 5 (Agent):** For short-term savings, consider building an emergency fund that covers 3-6 months of your living expenses. For longer-term goals, you might want to look into suitable savings accounts or fixed deposits.

The interface includes a top navigation bar with 'IBM watsonx', 'Upgrade', and user account information. The bottom of the screen shows a Windows taskbar with various application icons and system status (32°C Cloudy, 11:23).

# CONCLUSION

- The Digital Financial Literacy AI Agent leverages the power of IBM Watsonx.ai and Retrieval-Augmented Generation (RAG) to deliver accessible, accurate, and context aware financial guidance.
- By addressing real-world concerns like UPI safety, loan awareness, and scam prevention, the assistant empowers users to make informed financial decisions.
- With multilingual support and document-backed answers, it ensures inclusivity, trust, and reliability.
- This solution has the potential to bridge the digital divide and promote financial well being across diverse communities.

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# 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

- Getting Started with Artificial Intelligence



# IBM CERTIFICATIONS

- Journey to Cloud

In recognition of the commitment to achieve professional excellence



Jayapriya V

Has successfully satisfied the requirements for:

Journey to Cloud: Envisioning Your Solution



Issued on: Jul 19, 2025  
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Verify: <https://www.credly.com/badges/09bd6794-83c0-4bea-82aa-a0d31ae51226>



# IBM CERTIFICATIONS

- RAG Lab





**THANK YOU**