
CAPSTONE PROJECT

DIGITAL FINANCIAL LITERACY AI AGENT

Presented By:

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OUTLINE

- Problem Statement
- Proposed System/Solution
- System Development Approach
- Algorithm & Deployment
- Result (Output Image)
- Conclusion
- Future Scope
- References

PROBLEM STATEMENT

Many individuals face significant challenges in navigating the rapidly evolving digital financial landscape, including understanding how to use UPI, perform secure digital payments, manage loans, and budget effectively. The lack of accessible, clear, and trustworthy financial information often leaves users vulnerable to scams, fraud, and poor financial decisions. Although official resources and guidelines exist across various government portals and banking websites, these materials are frequently scattered, complex, and not user-friendly—especially for those from diverse linguistic and educational backgrounds. This gap highlights the urgent need for an intelligent, interactive solution that can simplify and personalize digital financial education, making it easily accessible to people from all walks of life and helping them build confidence while protecting them from common risks.

PROPOSED SOLUTION

- Proposed System/Solution – AI Agent for Digital Financial Literacy
- Conversational AI Agent:
 - Deploy an intelligent chatbot that interacts with users to answer questions on digital finance topics, such as UPI, online payments, digital banking, loans, budgeting, and fraud awareness.
 - The agent understands queries in plain language and supports multilingual interactions (English and regional Indian languages).
- Retrieval-Augmented Generation (RAG) Pipeline:
 - Upon receiving a user query, the backend performs semantic search in a curated knowledge base built from official government, banking, and educational sources (RBI, NPCI, NCFE, Ministry of Finance).
 - Retrieves the most relevant information or FAQ sections and supplies this context to an advanced language model for answer synthesis.
- IBM Granite/Watsonx LLM Integration:
 - The agent uses IBM Granite/Watsonx LLM to generate clear, personalized, and context-aware responses.
 - Provides step-by-step explanations, examples, and actionable advice, tailored to the user's language preference and level of understanding.
 - Delivers automated translation or adapts output for regional fluency.

PROPOSED SOLUTION - CONTD

- Proactive Safety & Empowerment Features:
 - The agent offers users safety tips, scam alerts, and best practices when discussing sensitive topics like digital payments, online lending, and account security.
 - Recommends additional learning resources, quizzes, or interactive modules to reinforce financial literacy.
- User Interaction & Accessibility:
 - User interface is a mobile-friendly, intuitive web app/chatbot that does not require technical expertise.
 - Accepts typed input and displays output in an easy-to-read, visually clear format with links to trustworthy sources.
- Deployment & Scalability:
 - Solution is securely deployed on IBM Cloud Lite for high availability and scalability.
 - Modular architecture enables easy integration of new features, regional languages, or additional financial topics as needed.

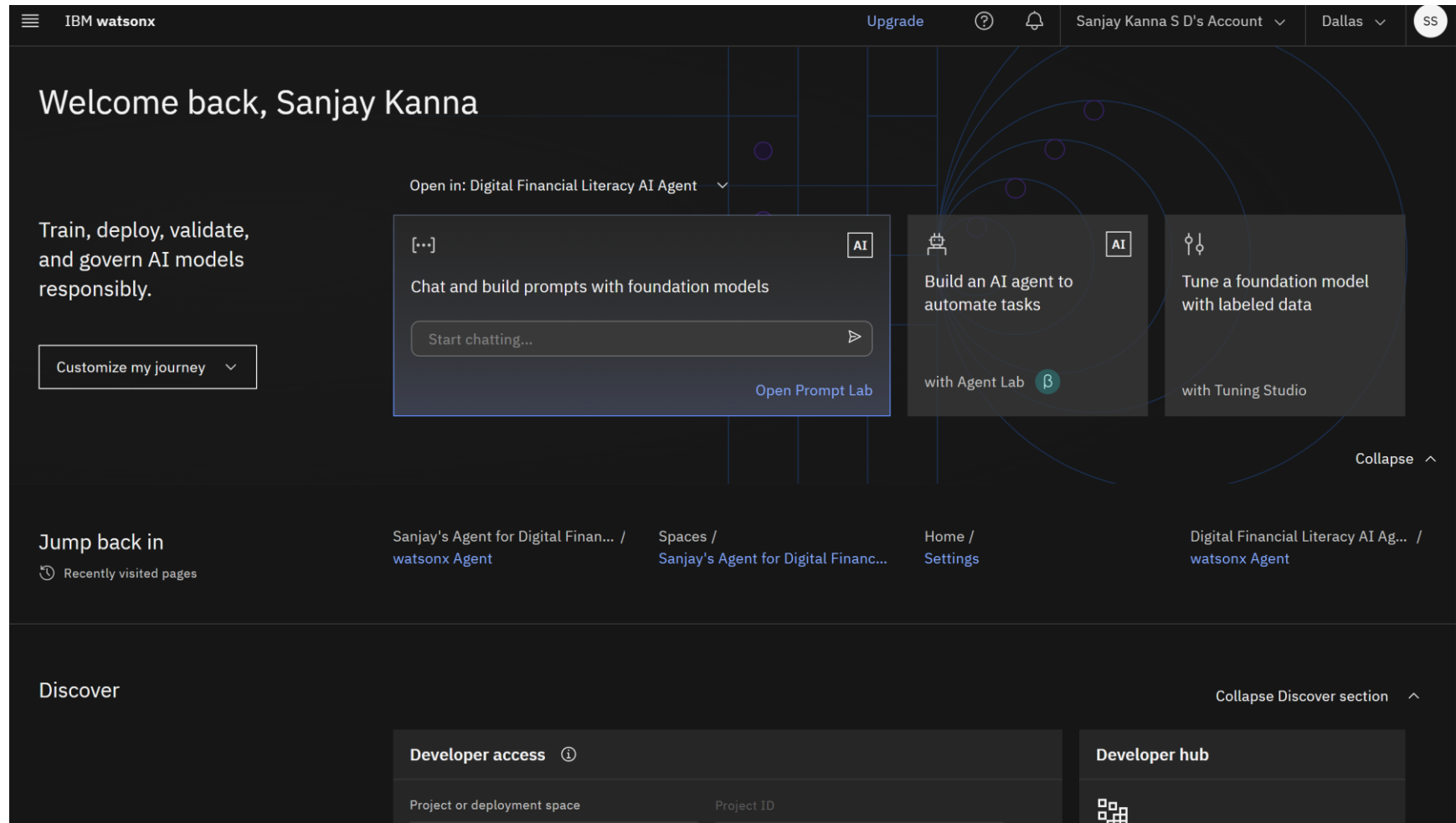
SYSTEM APPROACH

- IBM Cloud Lite for scalable, secure cloud deployment.
- IBM Granite LLM for advanced language generation, multi-language support, and adaptive, user-friendly responses.
- Knowledge base created from official documentation (PDFs, FAQs, guides) sourced from RBI, NPCI, government, and leading financial education sites.
- Python backend using RAG architecture: retrieves most relevant guides, then uses Granite to generate personalized answers.
- Simple web-based chatbot interface for easy user interaction and demo.

ALGORITHM & DEPLOYMENT

- **Algorithm Selection:**
The system uses a Retrieval-Augmented Generation (RAG) approach with IBM Granite/Watsonx LLM, combining semantic retrieval of official financial documents with powerful language generation to provide clear, relevant, and personalized answers. This method handles diverse user queries effectively.
- **Data Input:**
The agent leverages a curated knowledge base of RBI, NPCI, Ministry of Finance, and NCFE documents, along with the user's question and language preference. Periodic updates add recent financial guidelines and scam alerts.
- **Training Process:**
Pre-trained IBM Granite/Watsonx models are fine-tuned as needed for finance-related conversational tasks. The knowledge base is embedded using sentence transformers for efficient semantic search. Prompt engineering and user feedback help refine the agent's clarity and accuracy.
- **Response Generation:**
Upon receiving a query, the system retrieves relevant context, combines it with the user input, and generates stepwise, jargon-free responses with safety tips and resource links. Interaction logs and feedback enable ongoing improvements.
- **Deployment:**
The solution is deployed on IBM Cloud Lite, with a containerized, scalable web app accessible via desktop and mobile. Security measures ensure user data privacy and system reliability.

HOMEPAGE OF IBM WATSONX PAGE AFTER LOGGING IN TO IBM CLOUD, AND BUILDING AN AI AGENT



MY PROJECTS & ASSETS IN MY PROJECT

Projects

Digital Financial Literacy AI Agent

SD

7 h ago

IBM watsonx

Upgrade

Sanjay Kanna S D's Account

Dallas

SS

Projects / Digital Financial Literacy AI Agent

Launch IDE

Overview

Assets

Deployments

Jobs

Manage

Find assets

Import assets

New asset

4 assets

All assets

Asset types

Data access

1

Data

2


Agents


1

All assets

	Name	Last modified	
<input type="checkbox"/>	<div><div>watsonx Agent</div><div>Agent</div></div>	6 hours ago Modified by you	<div></div>
<input type="checkbox"/>	<div><div>Knowledge DataBase test</div><div>Vector index</div></div>	7 hours ago Modified by you	<div></div>
<input type="checkbox"/>	<div><div>CoreInvestment08052025.pdf</div><div>PDF</div></div>	7 hours ago Modified by you	<div></div>
<input type="checkbox"/>	<div><div>ALLNBFC23042025_merged.pdf</div><div>PDF</div></div>	7 hours ago Modified by you	<div></div>


SETUP, CONFIGURATION AND KNOWLEDGE

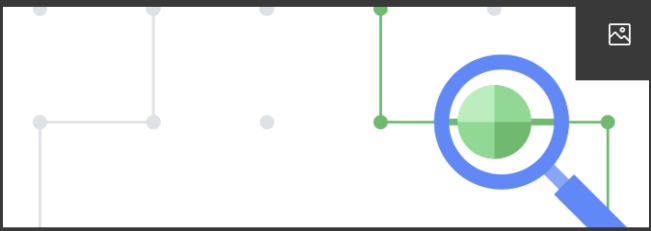
Build AI Model: granite-3-3-8b-instruct 


Setup 


Name
watsonx Agent


Description 78/100
Hello and welcome to your friendly Digital Financial Literacy Agent. Ask away!


Icon


Placeholder image



Setup 


Configuration 

Framework
LangGraph 

Architecture
ReAct 

Instructions [Advanced configuration](#)
You are a friendly and knowledgeable digital assistant designed to educate and assist users in understanding digital finance topics such as UPI, online payments, digital banking, personal budgeting, loans, credit scores, and fraud prevention. Your goal is to provide clear, accurate, and jargon-free answers using official guidelines and trusted sources from institutions like RBI, NPCI, NCFE, and the

Knowledge 

Vector index
Knowledge DataBase test 

A vector index searches documents for relevant information to ground the model. Upload the files to index or select an existing index.

CONFIGURATION OF THE AGENT

Advanced configuration

Agent instructions

Common instructions

Agent instructions are unique to this agent and will affect its specific behavior.

Reset to default



You are a friendly and knowledgeable digital assistant designed to educate and assist users in understanding digital finance topics such as UPI, online payments, digital banking, personal budgeting, loans, credit scores, and fraud prevention. Your goal is to provide clear, accurate, and jargon-free answers using official guidelines and trusted sources from institutions like RBI, NPCI, NCFE, and the Indian Ministry of Finance.

Always:

- Answer in simple, jargon-free language suitable for a first-time user.
- Provide step-by-step guidance if procedural.
- Highlight at least one tip or warning about common scams or mistakes relevant to the topic.
- Reference official RBI, NPCI, or NCFE guidelines wherever possible.
- If the question is about payments, UPI, cards, or loans, clearly mention security practices and red flags.
- Use the user's preferred language (translate/adapt as needed).
- If the user asks for more details or examples, provide simple scenarios or analogies from the retrieved documents.
- If uncertain about any answer, suggest users refer to official sources and provide a trustworthy link from the above.

Your responses should be compassionate, inclusive, and tailored to the user's context and knowledge level, making digital financial literacy accessible to everyone.

TOOLS CONFIG WHICH AGENT CAN USE, AND VECTOR INDEX DATABASE

Tools

Add a tool

Create custom tool

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 - Knowledge DataBase test

Search documents with vector indexes.

Webcrawler

Retrieve information from a website.

Vector index details

Vector store

In memory

Embeddings model

sentence-transformers/all-minilm-l6-v2

Vector index ID

5a60e588-5666-416a-aa83-bf1885f2acd8

Settings

Text chunk size:

2000

Text chunk overlap:

200

Split PDF:

On

Data included in vector index

Search data

Name	Size	
CoreInvestment08052025.pdf	232.4KB	

DEPLOYMENT SPACES

Deployment spaces /

Online deployments						
1 space						
<div><div></div><div>Find deployments</div></div>						
Name	Asset type	Status	Space	Copies	Last updated	Created
watsonx Agent	AI service	<div></div> Deployed	Sanjay's Agent for Digital Fin...	1	Aug 3, 2025, 6:56 PM	Aug 3, 2025, 6:56 PM

API REFERENCE AND ENDPOINTS

The screenshot displays the IBM watsonx Agent interface. At the top, the navigation bar includes the IBM watsonx logo, an 'Upgrade' button, a help icon, a notification bell, and user account information for 'Sanjay Kanna S D's Account' in the 'Dallas' region. The breadcrumb trail indicates the path: 'Deployment spaces / Sanjay's Agent for Digital Financial Literacy / watsonx Agent /'. The main content area is titled 'watsonx Agent' with a green 'Deployed' status and an 'Online' button. Below this, there are tabs for 'API reference' (selected), 'Test', 'Evaluations', and 'Preview'. The 'API reference' tab shows 'Endpoints for inferencing' with a help icon. It lists two types of endpoints: 'Private endpoint' and 'Public endpoint', each with two example URLs. To the right of these URLs is a 'Bearer <token>' field with an 'IAM' button. Below the endpoints, there is a link to 'Learn more about the 2021-05-01 version query parameter'. The 'Code snippets' section at the bottom has tabs for 'cURL' (selected), 'Java', 'JavaScript', 'Python', and 'Scala'. A note states: '# NOTE: you must set \$API_KEY below using information retrieved from your IBM Cloud account (https://datapatform.cloud.i...'. On the right side, a sidebar titled 'About this deployment' provides details: Name (watsonx Agent), Description (Hello and welcome to your friendly Digital Financial Literacy Agent. Ask away!), Deployment Details (Deployment ID: dc0f6670-984a-43..., Serving name: No serving name., Software specification: runtime-24.1-py3.11, Hardware specification: Extra extra small: 1 CPU and 2 GB RAM, Copies: 1), Tags (wx-agent), Associated asset (watsonx Agent, e48ad031-96f5-4239-aa87-7fc98124df28), and Last modified.

IBM watsonx Upgrade ? ⓘ Sanjay Kanna S D's Account Dallas

Deployment spaces / Sanjay's Agent for Digital Financial Literacy / watsonx Agent /

watsonx Agent ✓ Deployed Online

API reference Test Evaluations Preview

Endpoints for inferencing ⓘ

Private endpoint

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/dc0f6670-984a-4301-9fdf-21068d5a5b6d`

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/dc0f6670-984a-4301-9fdf-21068d5a5b6d`

Public endpoint

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/dc0f6670-984a-4301-9fdf-21068d5a5b6d`

`https://us-south.ml.cloud.ibm.com/ml/v4/deployments/dc0f6670-984a-4301-9fdf-21068d5a5b6d`

Learn more about the 2021-05-01 version query parameter

Code snippets

cURL Java JavaScript Python Scala

NOTE: you must set \$API_KEY below using information retrieved from your IBM Cloud account (https://datapatform.cloud.i

Bearer <token> ⓘ

IAM

About this deployment ×

Name

watsonx Agent

Description

Hello and welcome to your friendly Digital Financial Literacy Agent. Ask away!

Deployment Details

Deployment ID: dc0f6670-984a-43...

Serving name:

No serving name.

Software specification:

runtime-24.1-py3.11

Hardware specification:

Extra extra small: 1 CPU and 2 GB RAM

Copies:

1

Tags

wx-agent






Associated asset

watsonx Agent

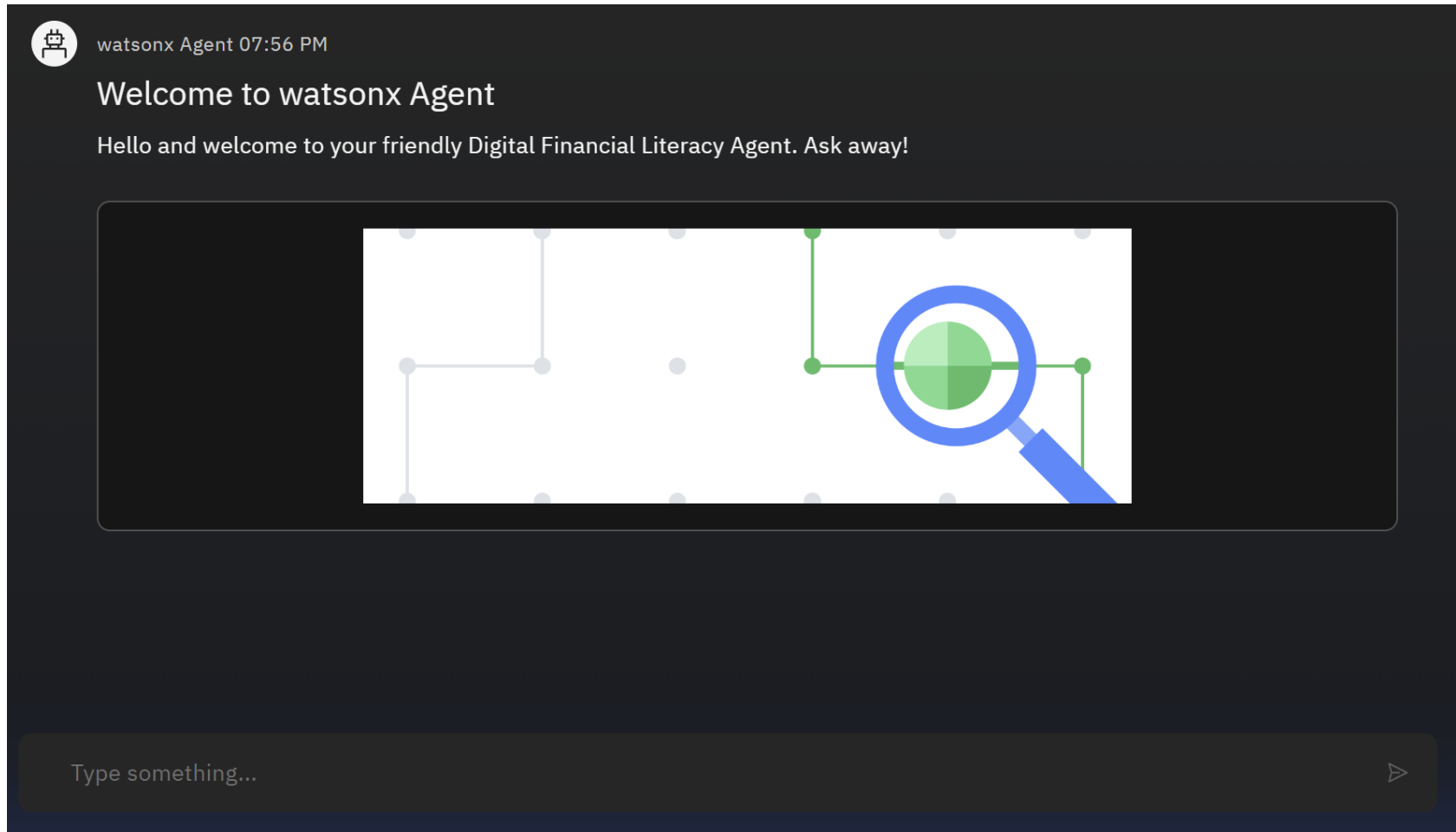
e48ad031-96f5-4239-aa87-7fc98124df28

Last modified

RESOURCE LISTS

^ Storage (1)						
	Cloud Object Storage-xe	Default	Global	Cloud Object Storage	✓ Active	cpdaas
v Converged infrastructure (0)						
v Enterprise applications (0)						
^ AI / Machine Learning (3)						
	WatsonStudio	Default	Dallas (us-south)	watsonx.ai Studio	✓ Active	cpdaas
	watsonx.ai Runtime-gf	Default	Dallas (us-south)	watsonx.ai Runtime	✓ Active	cpdaas
	watsonx.governance	Default	Dallas (us-south)	watsonx.governance	✓ Active	cpdaas
v Analytics (1+)						
v Blockchain (0)						
^ Databases (1)						
	watsonx.data	Default	Dallas (us-south)	watsonx.data	✓ Active	cpdaas

RESULT





You 08:04 PM

How do I use UPI safely?



watsonx Agent 08:04 PM

Using UPI (Unified Payments Interface) safely involves several steps to protect your financial information:

1. **Use a Strong PIN:** Always set a unique and strong PIN for UPI transactions. Avoid using easily guessable PINs like birthdays or sequences like 1234.
2. **Enable Two-Factor Authentication (2FA):** This adds an extra layer of security. When 2FA is enabled, you'll need to approve transactions via an OTP (One Time Password) sent to your registered mobile number or email.
3. **Regularly Update Your Apps:** Keep your UPI apps updated to the latest version. Developers often release updates that include security patches to protect against new threats.
4. **Beware of Phishing:** Be cautious of suspicious links or requests asking for your UPI ID, virtual payment address, or bank account details. Legitimate organizations will never ask for sensitive information via text or email.
5. **Monitor Transactions:** Regularly check your bank statements for any unauthorized transactions. Report any discrepancies to your bank immediately.
6. **Use Secure Networks:** Avoid conducting UPI transactions over public Wi-Fi networks as they can be less secure. Use a trusted network or a VPN (Virtual Private Network) for added security.
7. **Limit Sharing:** Only share your UPI ID or virtual payment address with trusted contacts. Do not share it publicly or with unknown individuals.

Remember, the Reserve Bank of India (RBI) advises users to not share their UPI PIN, one-time password (OTP), or full bank account details with anyone.

For more detailed information, you can refer to the official NPCI (National Payments Corporation of India) guidelines or the RBI's website.



You 06:59 PM

What is a Core Investment Company (CIC)?



watsonx Agent 06:59 PM

A Core Investment Company (CIC) is a type of investment company defined by the Investment Company Act of 1940 in the United States. However, as you haven't specified a particular jurisdiction, I'll provide information based on general investment principles.

In simple terms, a CIC is a company that primarily invests in other companies rather than in bonds, real estate, or commodities. These companies are often mutual funds or exchange-traded funds (ETFs) that aim to provide diversified investment opportunities to individual investors.

In India, there isn't a direct equivalent term for CIC. However, mutual funds and ETFs serve a similar purpose, pooling money from many investors to buy a diversified portfolio of stocks, bonds, or other securities.

Tip: Always research thoroughly before investing in any mutual fund or ETF. Look at the fund's historical performance, the fees it charges, and the specific securities it holds.

For more detailed information, you can refer to the Securities and Exchange Commission (SEC) guidelines on Investment Companies in the U.S. or consult with a financial advisor familiar with Indian investment products.

[{"arguments": {"query": "Core Investment Company definition"}, {"name": "Wikipedia"}]

► How did I get this answer?



CONCLUSION

- The AI agent simplifies complex digital finance topics, making them easy to understand for diverse users.
- Provides personalized, accurate guidance on digital payments, loans, budgeting, and scam prevention.
- Supports multiple languages to ensure inclusivity and broaden accessibility.
- Enhances user security by proactively sharing safety tips and fraud warnings.
- Deployed on IBM Cloud for scalability, reliability, and secure access.
- Promotes financial inclusion and digital empowerment by bridging knowledge gaps.
- Continuously improves through user feedback and knowledge base updates to maintain accuracy.

FUTURE SCOPE

- Expand knowledge base to cover more regional languages and new financial products.
- Integrate voice interaction for even greater accessibility.
- Add user progress tracking, quizzes, and adaptive learning modules for sustained financial literacy growth.
- Real-time updates from government APIs on new schemes, fraud alerts, and regulatory changes.

REFERENCES

- RBI Financial Literacy Portal – <https://www.rbi.org.in/financialeducation/>
- NPCI UPI Safe Payment Tips – <https://wbpay.in/en/upi-fraud-protection-npcis-new-guidelines-to-keep-your-money-safe/>
- Ministry of Finance – <https://financialservices.gov.in/beta/en>
- NCFE Financial Education – <https://ncfe.org.in/>

GITHUB REPOSITORY LINK

- <https://github.com/daredevil-sk/Digital-Financial-Literacy-Agent-SK>

IBM CERTIFICATIONS

In recognition of the commitment to achieve
professional excellence



Sanjay Kanna S D

Has successfully satisfied the requirements for:

Getting Started with Artificial Intelligence



Issued on: Jul 15, 2025
Issued by: IBM SkillsBuild

Verify: <https://www.credly.com/badges/6a47d156-5593-49f2-837d-120b07212fc9>



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Journey to Cloud: Envisioning Your Solution



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IBM CERTIFICATIONS

IBM **SkillsBuild**

Completion Certificate



This certificate is presented to

Sanjay Kanna S D

for the completion of

**Lab: Retrieval Augmented Generation with
LangChain**

(ALM-COURSE_3824998)

According to the Adobe Learning Manager system of record

Completion date: 25 Jul 2025 (GMT)

Learning hours: 20 mins



THANK YOU