Agentic AI Application Primer 101

Basic Vocabulary

LLM (Large Language Models)
OpenAI (ChatGPT), Anthropic (Claude), Google (Gemini), Llama (OpenSource – Local LLM), Grok (X), Copilot (Microsoft),

→ Think of them as **translators and reasoning engines**

- Convert language → structured data (numbers, vectors)
- Convert data → language (answers, summaries, insights)
- Most people see chat, but the real power is API access to the LLMs

Vector Databases – RAG (Retrieval Augmented Generation) is an AI framework that improves LLM accuracy by retrieving data from external, trusted sources before generating a response.
pgvector (PostgreSQL), Pinecone, Weaviate, Chroma.

Pgvector is an open-source extension for PostgreSQL that enables the storage, indexing, and similarity searching of vector embeddings (numerical representations of data) directly within the database. It allows developers to perform semantic searches—finding data based on meaning rather than keywords—using standard SQL queries.

→ The Key is RAG, meaning the LLM does not access the general LLMs data set, but a curated Dataset, and the LLM is used to interact with it.

Agentic Applications (AI Agents)
→ The next evolution beyond interactive LLM prompting

"Agentic" describes a person or system capable of independent action, decision-making, and goal-pursuit without needing constant, step-by-step guidance. Derived from "agency," it refers to being self-directing and proactive rather than reactive.

In AI (Agentic AI): Agentic describes AI systems that act as "doers" or "digital employees." They use Large Language Models (LLMs) to reason through complex, multi-step tasks, connect to external tools (APIs, databases), and make decisions independently.

AI Agents = LLM + Tools + Memory + Workflow
→ The LLM is the **decision engine**, not the system
→ The system is everything around it

a **working definition**: An Agentic AI Application is a system that can:

1. Interpret a user goal

2. Retrieve relevant data
3. Use tools or functions
4. Execute multi-step workflows
5. Return structured, actionable results

Platform Architecture and Tools

1. LLM Gateway

→ Central access point to models

Examples: ChatGPT (OpenAI), Claude (Anthropic), Gemini (Google), Grok (SpaceX), Co-Pilot (Microsoft)

2. Tool Registry

→ What the agent can *do*. Interactions with other tools and APIs.

3. Retrieval Layer

→ How the agent gets data

- SQL queries (structured)
- Vector search (semantic), PostgreSQL
- Hybrid (combination of both)

4. Orchestrator (Agent Runtime)

→ Manages workflows and decisions

Examples: n8n, LangChain, LangGraph, custom logic

5. Memory / State Store

→ What the system remembers

6. Observability / Evaluation

→ Logging, testing, improving

Potential Agentic Applications for Philately

Collector-Facing

- Stamp Identifier (ID, grading clues, expertization signals)
- Auction Scout (find want-list items across platforms)
- Valuation Engine (price history, provenance, census)

Knowledge & Research

- Philatelic Knowledgebase (books, articles, exhibits)
- Census and Provenance discovery and linking
- Exhibit building assistants

Education

- Kids learning tools
- Collector training
- Dealer / auction house onboarding

Trade & Market Tools

- Dealer/Auction describers (catalog writing)
- Market analytics (trends, rarity signals)

Why would these be better as Agentic Applications?

- LLMs can do a better job of delivering data
- Too much data
- Data can be designed to self update.

Case Study: Philately.Live (Agentic AI in Practice)

Philately.Live may look like a reference website, but it is an **early Agentic AI application for philately introduced in the fall of 2023**. **Why it qualifies as an Agentic Application:**

- **LLM Layer**
  Built and updated using an LLM to scrape 1000s of websites, summarize, categorize and store in both a structured and vector database.
- **Retrieval Layer**
  - structured content – traditional keyword searching
  - vector database – used by the ChatBot to answer unstructured questions.
- **Memory / Knowledge Store**
  - Trained on 2154 organizations and 1113 resources.
  - Articles (e.g., Exportas, Auction Tips)
  - PDFs and Word documents
  - Google Docs (provenance, research, etc.)
- **Tools**
  - Chatbot
  - Embedded custom extracts on other websites.
- **Workflow**
  User asks → system retrieves → LLM interprets → response generated

What makes it important:

- Released September 2023 — early mover in AI for philately
- Demonstrates **RAG (Retrieval-Augmented Generation)** in a real domain
- Shows how **unstructured philatelic knowledge can become queryable**

Example queries it can handle

- "Tell me about the IYS Hoard"
- "What are 10 insider tips for bidding at auction?"
- "What are difficult Exportas on cover?"

Key Insight:
Philately.live was not designed as a full data repository, think of it as a card catalog that drives users to the hosted content. But it is a prototype and example of a foundation for a full agent repository of global philatelic content.

Why an Agentic AI Roundtable Matters – The Reason for the Group

1. Knowledge Transfer

- Capture decades of expertise before it is lost
- Make expert knowledge accessible to new and experienced collectors

2. Access to Curated Information

- Move beyond scattered content
- Build **trusted, domain-specific AI systems**
- Reduce misinformation from generic AI

3. Grow the Hobby

- Make philately more interactive and engaging
- Attract younger and tech-oriented audiences

4. Create Sustainable Models

- Monetize data (catalogs, auction results, research)
- Enable paid APIs and agent access
- Support authors, experts, and institutions

Challenges We Need to Solve

1. Adoption

- Many collectors are not yet using AI tools and are suspicious based on early experiences or hearsay.
- Need simple, practical use cases (not hype)

2. Attribution & Compensation

- How are contributors credited and paid?

3. Metering & Usage

- How do we charge for access?
- API usage, subscriptions, per-query pricing

4. Data Quality

- Philately is nuanced
- Bad data → bad conclusions
- Need curated, trusted datasets

Key Issue:

AI is only as good as the **data + structure behind it. We need our own curated RAG based Philately AIs.**

Goals for the Agentic AI Roundtable

1. Lead the Conversation

- Define how AI should be used responsibly in the hobby while developing useful applications.

2. Build Real Applications

- Move beyond discussion → working examples
    - Auction Scouting – APIs to StampAuctionNetwork
    - Identification Tools
    - Society Based Tools

3. Move toward a global Philately.AI Vision

- **A global, curated AI knowledge system for philately**
    - Literature, books, journals, articles
    - Auction data
    - Exhibits

4. Encourage Innovation

- Enable developers, collectors, and institutions
- Provide frameworks and shared tools

5. Set Standards

- Data formats
- Attribution
- API access
- Monetization models

6. Host an Online Conference

- Focused on Agentic Applications in Philately
- Showcase working tools
- Bring together collectors, developers, and institutions