



Slide 1: Title Slide

Agentic RAG Chatbot

For Multi-Format Document QA Using **Model Context Protocol (MCP)**

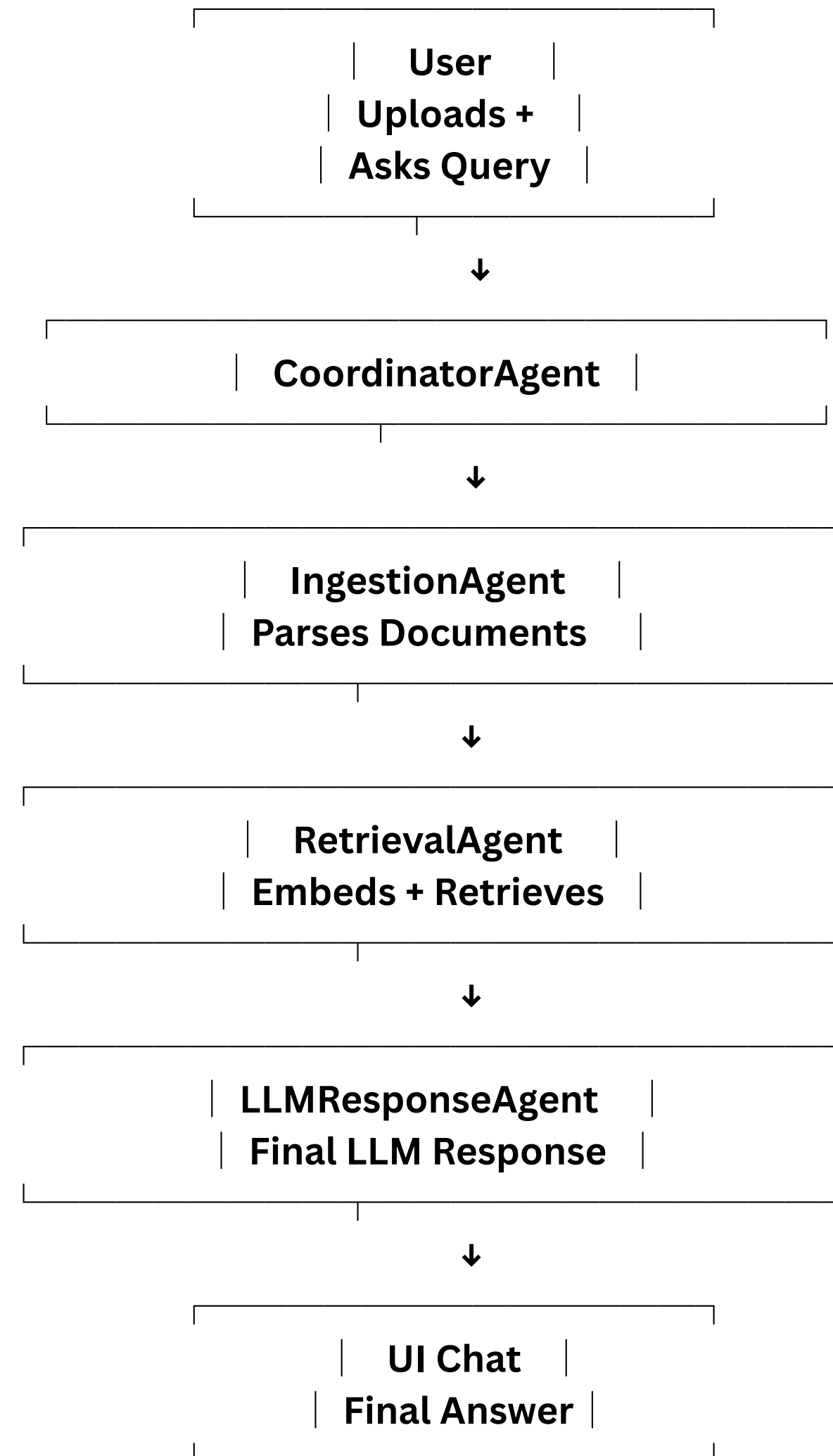
- ◆ A **Retrieval-Augmented Generation (RAG)**-based chatbot powered by modular agents
 - ◆ Supports answering questions from **PDF, DOCX, PPTX, TXT, CSV** files

Submitted by:
Kritika Aggarwal

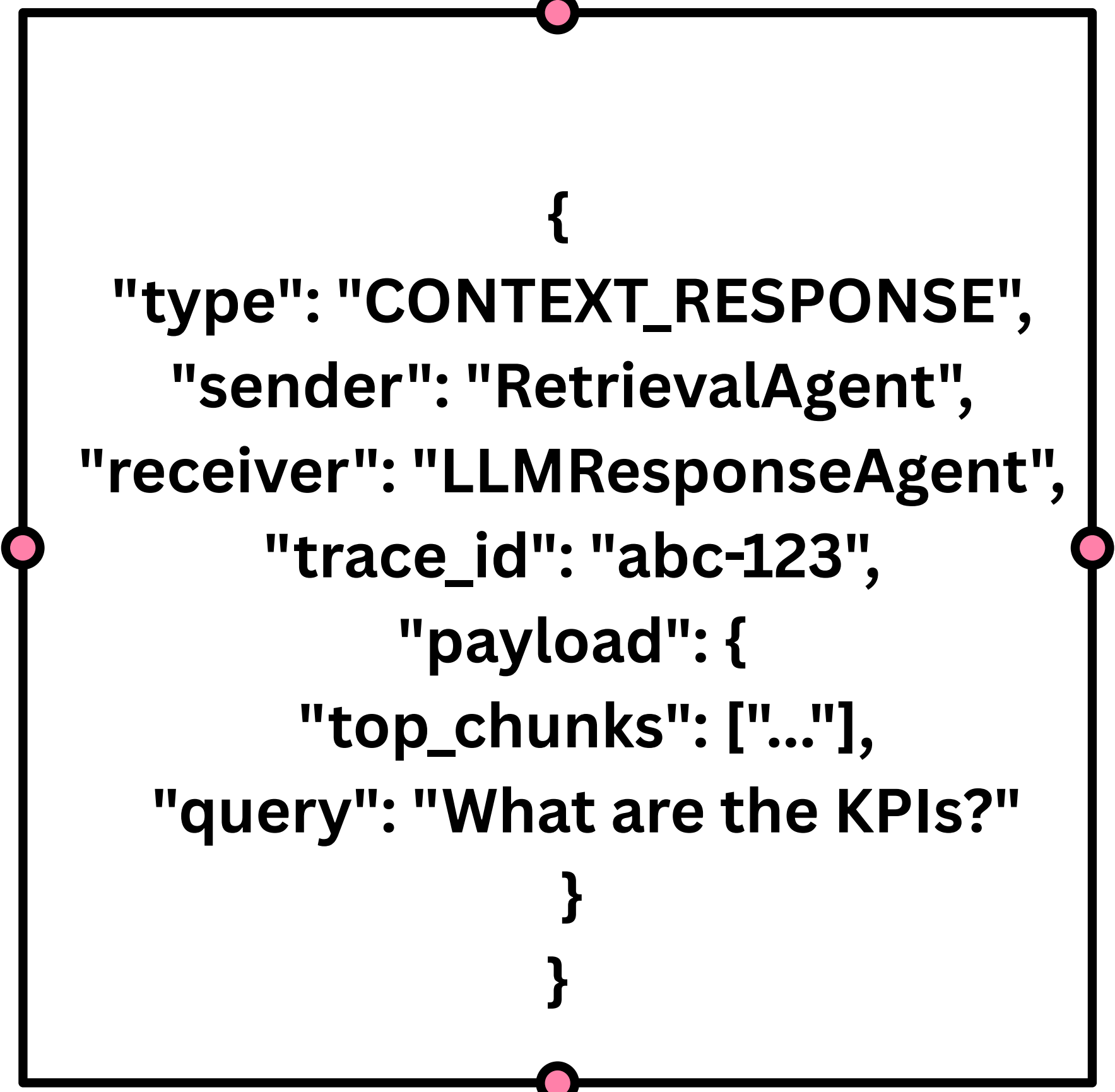
,”

⚙️ Slide 2: Agent-Based Architecture with MCP

System Overview with MCP Messaging








✓ Agents communicate using structured MCP (Model Context Protocol) objects like:



```
{  
  "type": "CONTEXT_RESPONSE",  
  "sender": "RetrievalAgent",  
  "receiver": "LLMResponseAgent",  
  "trace_id": "abc-123",  
  "payload": {  
    "top_chunks": ["..."],  
    "query": "What are the KPIs?"  
  }  
}
```

Slide 3: System Flow Diagram

End-to-End Flow:

-  User uploads multi-format documents (PDF, DOCX, CSV, PPTX, etc)
 -  IngestionAgent parses content into readable chunks
 -  RetrievalAgent generates embeddings + finds top relevant context
 -  LLMResponseAgent formats the query and calls the LLM
 -  Final answer with source context shown in UI
- All message passing is done via MCP with structured traceable messages.

Slide 4: Tech Stack Used

Component	Technology/Tool
UI Framework	Streamlit
LLM (Local/Cloud)	OpenAI / HuggingFace
Embeddings	Sentence Transformers (all-MiniLM)
Vector DB	FAISS / Chroma
File Parsing	PyMuPDF, python-docx, python-pptx, pandas
Agent Framework	Python Modules
Message Protocol	MCP (in-memory JSON objects)
Supported Formats	PDF, DOCX, PPTX, CSV, TXT



Slide 5: Challenges Faced & Future Scope



Challenges Faced:

- Parsing and cleaning diverse file types (especially PPTX)
- Designing clean chunking logic for large documents
- Ensuring relevant semantic retrieval with minimal noise
- MCP integration across agents while maintaining traceability
- UI responsiveness and multi-turn chat session handling



Future Scope:

- Upgrade MCP from in-memory to message queues (e.g., Kafka / Redis pub-sub)
- Add user authentication and chat history
- Improve chunk ranking using Rerankers or hybrid search
- Extend to LangGraph or LangChain Agents
- Deploy on cloud platforms like Hugging Face Spaces or GCP