LangChain: Chat with Your Data

AI ALPHABETIZATION PROJECT

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INTRODUCTION
to LangChain

What is LangChain?

A framework for building applications powered by **large language models (LLMs)**, designed to process and interact with your data dynamically.

Key Features:

- Seamlessly connects LLMs with **your specific data**.
- Supports **retrieval-augmented generation** for advanced data insights.
- Integrates tools, APIs, and memory for customized solutions.

Why LangChain?

- Simplifies complex workflows.
- Optimizes decision-making with real-time insights.
- Enhances efficiency in **industries like manufacturing**.

Source:(https://www.langchain.com/)
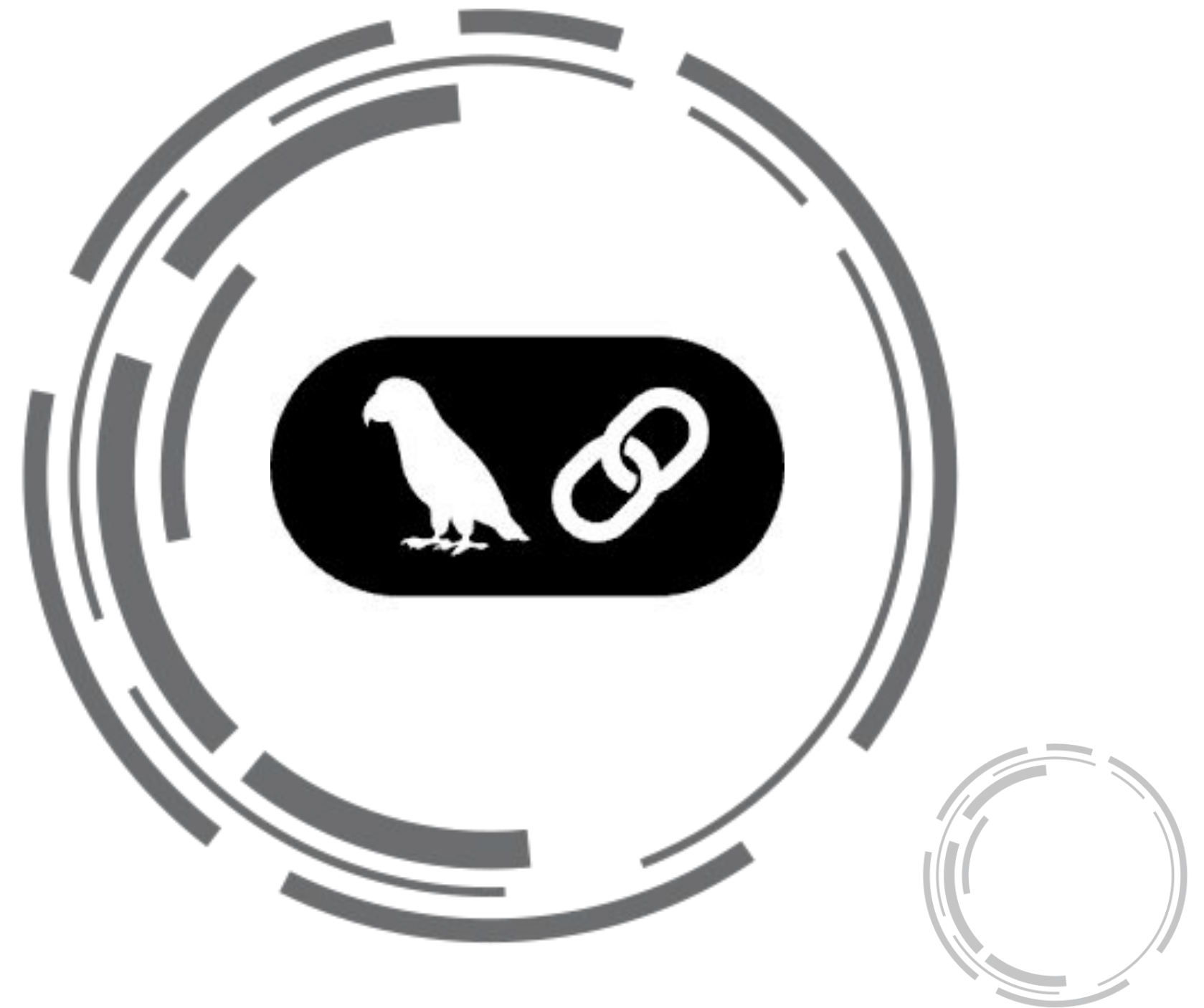
Overview of LangChain

Document Loading:
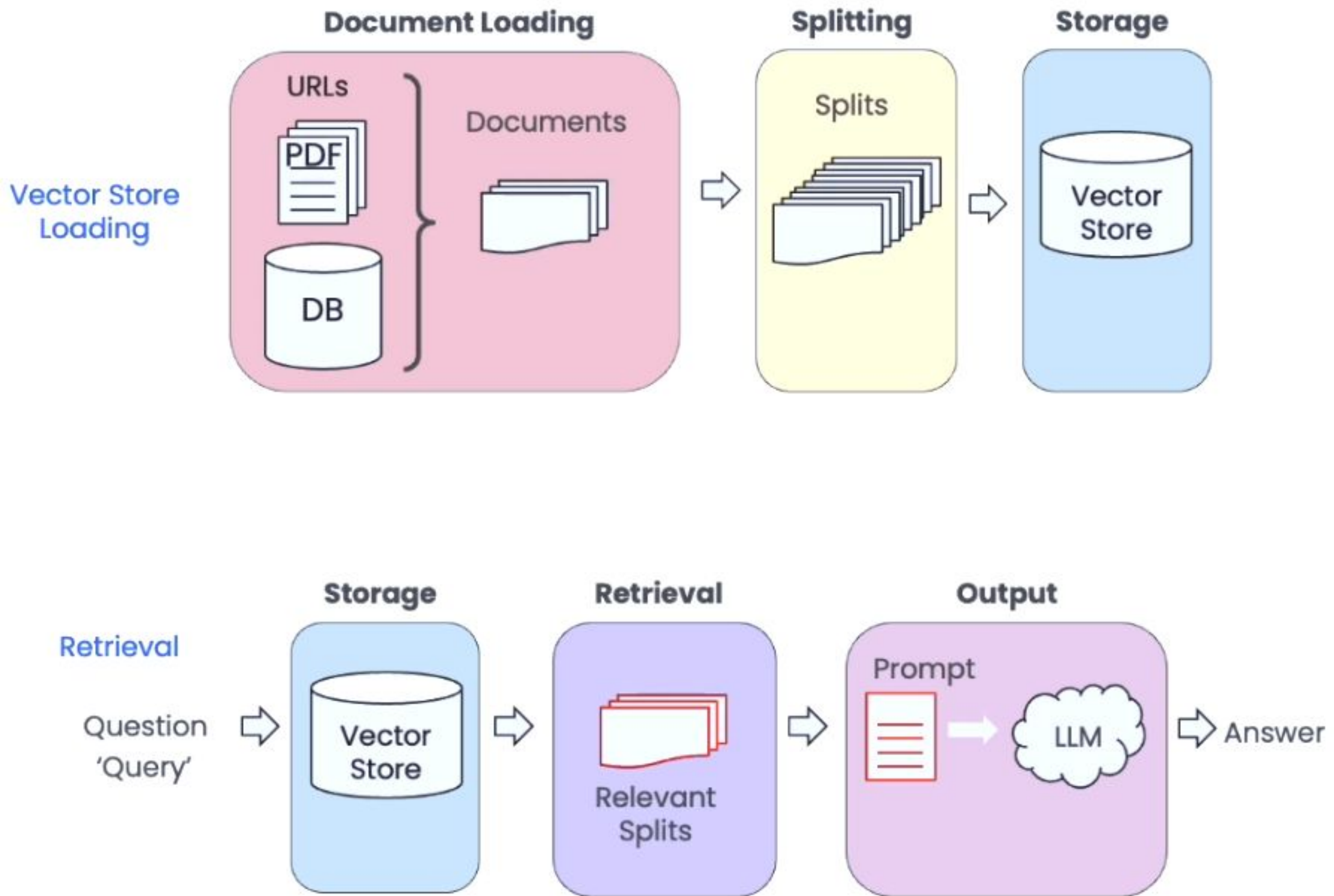Import data from various sources for seamless processing.
Document Splitting:
Break large documents into smaller chunks for easier handling.
Vectorstores & Embeddings:

- Convert text into numerical vectors (embeddings).
- Store these embeddings in databases for fast retrieval.

Source:(https://learn.deeplearning.ai/courses/langchain-chat-with-your-data/)

Vector Store Loading

Document Loading

URLs

PDF

DB

Documents

Splitting

Splits

Storage

Vector Store

Retrieval

Question 'Query'

Storage

Vector Store

Retrieval

Relevant Splits

Output

Prompt

LLM

Answer

Source:

Key Functionalities

ConversationalRetrievalChain

Chat History + Question

Store

Relevant splits

map-reduce

System: Prompt | Human: Question

LLM

Answer

You can add additional Retriever and compression features as needed
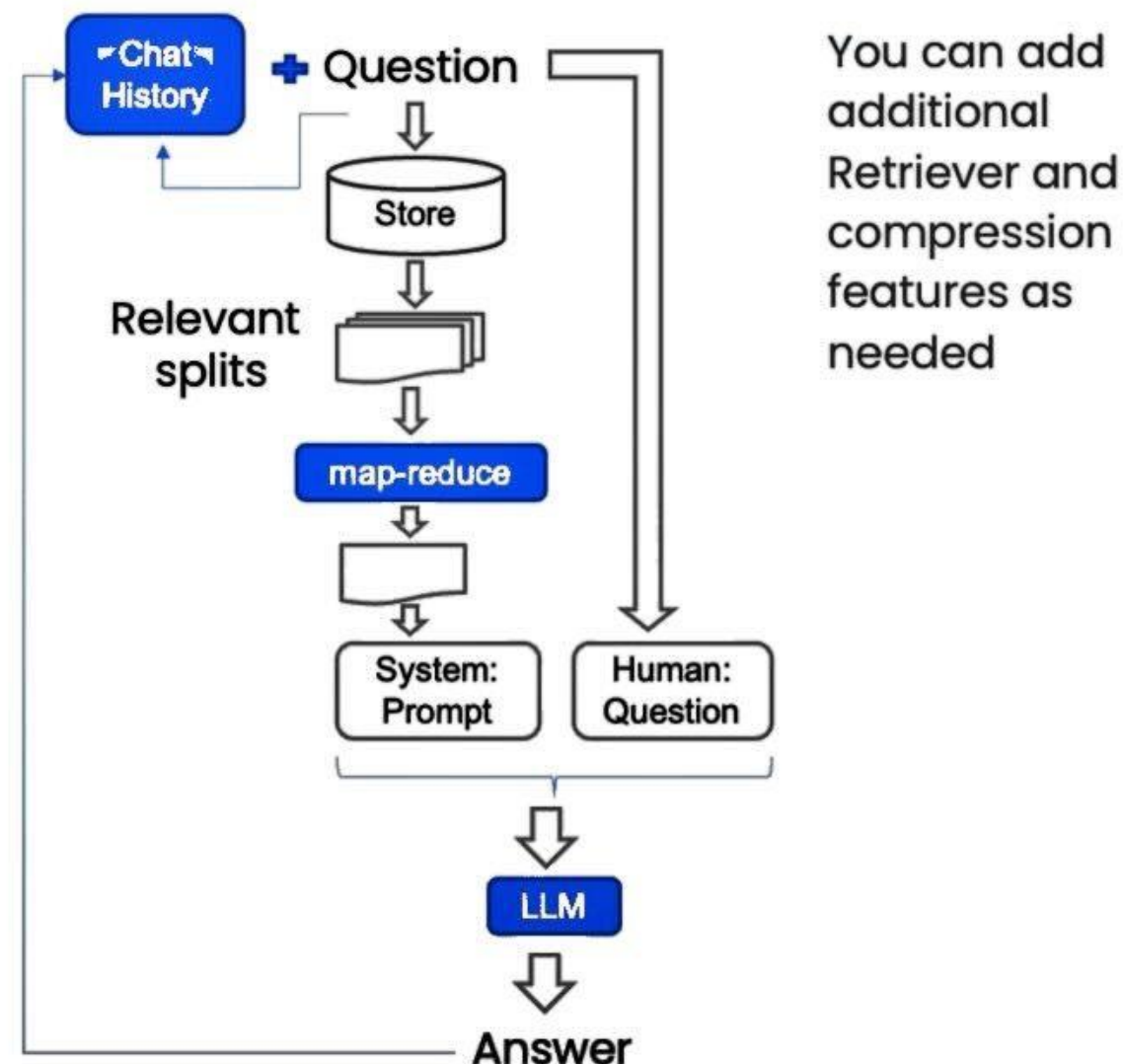
Data Retrieval & Interaction

- **Data Retrieval:**
  Locate and extract relevant information efficiently from vectorstores.
- **Questioning & Answering:**
  Enable users to ask questions and receive accurate, data-driven answers.

Chatbot Creation

- Build an interactive chatbot that:
  - Engages users in conversations.
  - Provides insights derived from your data.

Source:(https://learn.deeplearning.ai/courses/langchain-chat-with-your-data/)

Practical Example – OCI Product Chatbot Using LangChain

Objective:

- Build a chatbot to answer questions about OCI's product catalogues efficiently.

How It Works:

1. **Data Input:** Uploaded OCI product catalogues in PDF format.
2. **Processing:**
   - Splitting documents into smaller chunks for better analysis.
   - Generating embeddings (numerical text representations).
3. **Storage:** Organized data in a vector database for fast retrieval.
4. **Interaction:** User queries are matched to the database, and the chatbot provides instant answers.

REAL WORLD
APPLICATIONS

1. **CUSTOMER SUPPORT AND SERVICE**

   EXAMPLE: https://www.podium.com/ls/

2. **LEGAL ASSISTANCE**

   EXAMPLE: https://casetext.com/

3. **HEALTHCARE APPLICATIONS**

   EXAMPLE: https://www.healthtap.com/

4. **FINANCIAL ANALYSIS AND INVESTMENT**

   EXAMPLE: https://www.bloomberg.com/middleeast

5. **HR AND RECRUITMENT**

   EXAMPLE:
   https://5ly.co/case-studies/hr-automation-tool/?utm_source=chatgpt.com

How to apply the AI tool in a manufacturing industry (OCI)

1 DOCUMENT LOADING FOR TECHNICAL KNOWLEDGE MANAGEMENT
- TECHNICAL DOCUMENTS :
  - QUALITY CONTROL PROTOCOLS
  - SAFETY GUIDELINES
  - INSPECTION REPORTS

2 DOCUMENT SPLITTING

3 EMBEDDINGS

How to apply the AI tool in a manufacturing industry (OCI)

4 — RETRIEVAL FOR REAL TIME DECISION MAKING
-RETRIEVE TEST PARAMETER DURING PRODUCTION

5. — INTERACTIVE CHATBOTS FOR EMPLOYEE SUPPORT

6. — QUALITY CONTROL

CONCLUSION

To conclude, LangChain transforms data interaction with AI-driven efficiency. This enhances efficiency, accelerates decision-making, and optimizes resource utilization. With ongoing updates, LangChain can scale to meet OCI's needs, keeping us competitive in the manufacturing industry.

THANK YOU!

Thank you for exploring the potential of AI technology with us!