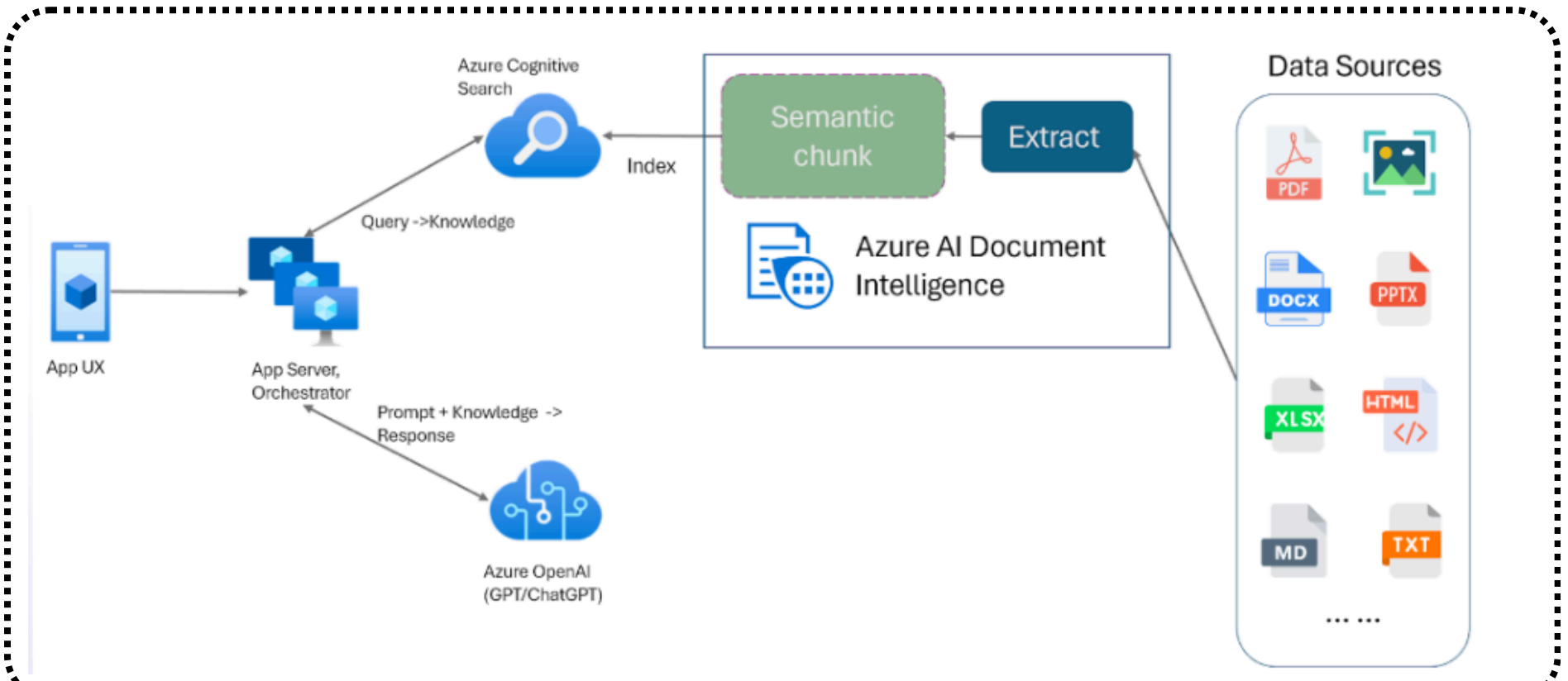
Analytics Vidhya

A Guide to Multimodal RAG

Relational AI Graph (RAG)



Anatomy of RAG Components

1. Data Ingestion
Different data formats and system of records

2. Chunking
What is the best chunking strategy suits?

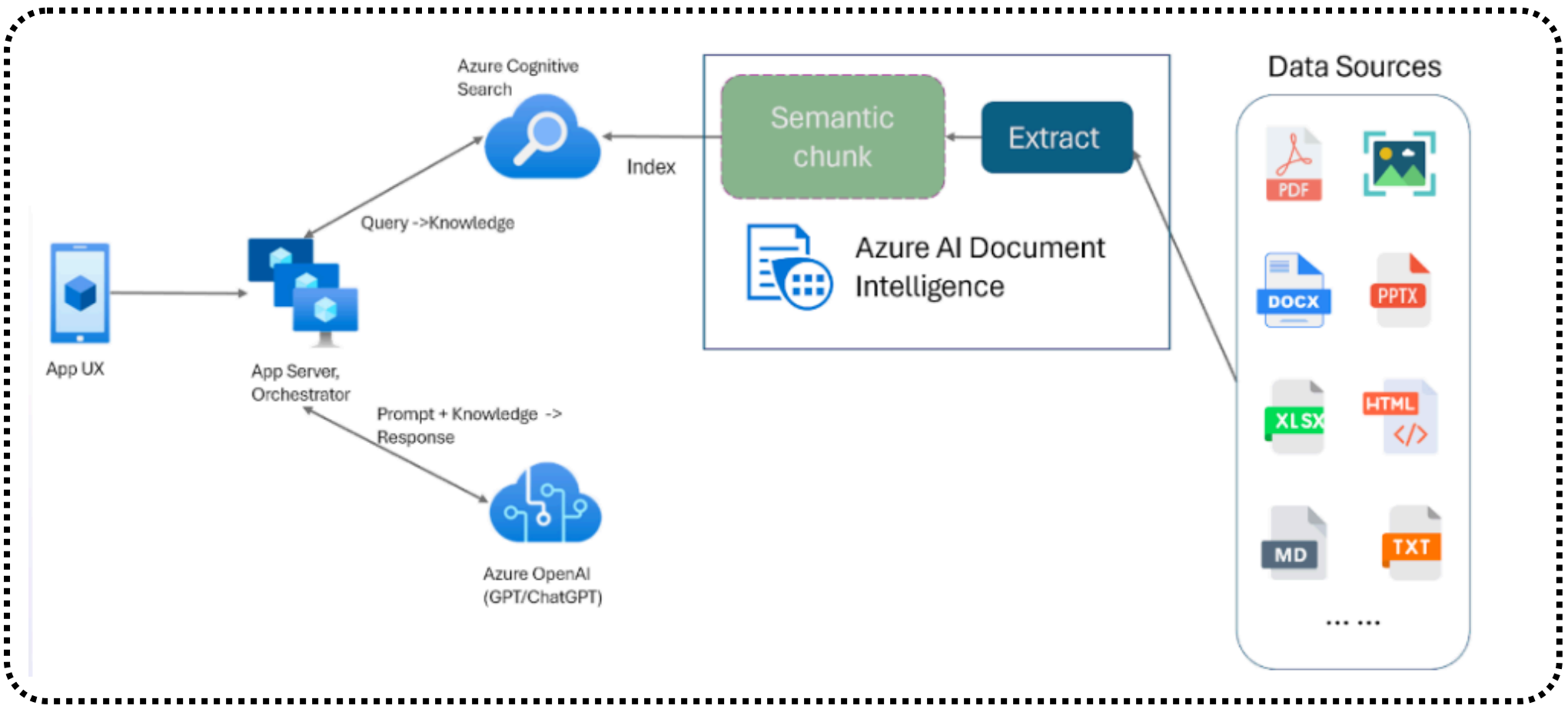
3. Indexing
Shall I use Vectors, Semantic or traditional approach?

4. Prompting
Tools, techniques and strategies of prompting

5. User Interface
How to surface data?

What is Relational AI Graph (RAG)?

- Relational AI Graphs (RAG) is a framework for mapping, storing, and analyzing relationships between data entities in a graph format.
- It operates on the principle that information is interconnected, not isolated. This graph-based approach outlines complex relationships, enabling more sophisticated analyses than traditional data architectures.



- In a regular RAG, data is stored in two main components they are **nodes** or **entities** and the second is **edges** or **relationship** between entities.

- For example, the node can correspond to a client, while the edge – to a purchase made by that customer, if it is used in a customer service application.

- This graph can capture different entities and relations between them, and help businesses to make further analysis on customers' behavior, trends, or even outliers.

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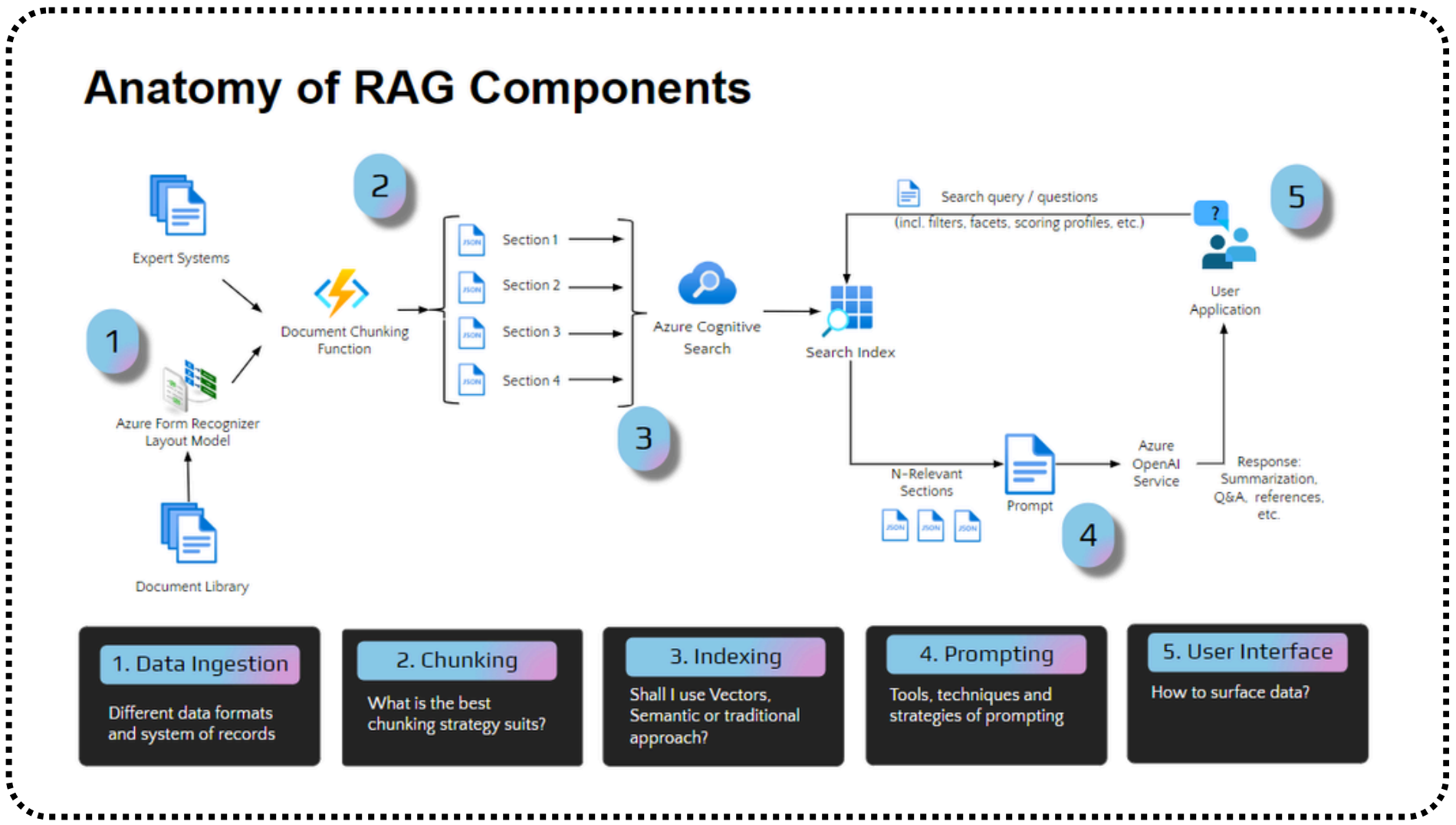

- **Expert Systems**: Azure Form Recognizer, Layout Model, Document Library.
- **Data Ingestion**: Handling various data formats.
- **Chunking**: Best strategies for data chunking.
- **Indexing**: Search queries, filters, facets, scoring.
- **Prompting**: Vector, semantic, or traditional approaches.
- **User Interface**: Designing data presentation.
- **Integration**: Azure Cognitive Search and OpenAI Service.

What is Multimodality?

- Exploring Relational AI Graphs and present day AI systems, multimodal means the capacity of the system to handle the information of different types or ‘modalities’ and amalgamate them within a single recurrent cycle.

- Every modality corresponds to a specific type of data, for example, the textual, images, audio or any structured set with relevant data for constructing the graph, allowing for analysis of the data’s mutual dependencies.

- Multimodality extends the traditional approach of dealing with one form of data by allowing AI systems to handle diverse sources of information and extract deeper insights. In RAG systems, multimodality is particularly valuable because it enhances the system’s ability to recognize entities, understand relationships, and extract knowledge from various data formats, contributing to a more accurate and detailed knowledge graph.

Understanding Multimodal RAG

- Multimodal RAG Systems enhances traditional RAG by integrating various data types, such as text, images, and structured data.
- This approach provides a more holistic view of knowledge extraction and relationship mapping. It allows for more powerful insights and decision-making. By using multimodality, RAG systems can process and correlate diverse information sources, making analyses more adaptable and comprehensive.