



# Microsoft Federal Developer Summit

## Building AI Solutions

Joe Madaus | Azure Open AI “From Zero To Hero”  
| 13 November, 2024



# AGENDA

- Intro – Ideation --> How To Effectively Go From The AI Buzz To Real Outcomes
- Use Case 1 – Lets Chat With Search
- Use Case 2 – GraphRAG
- Questions?



# Intro: We Are Moving Fast



Highlights:

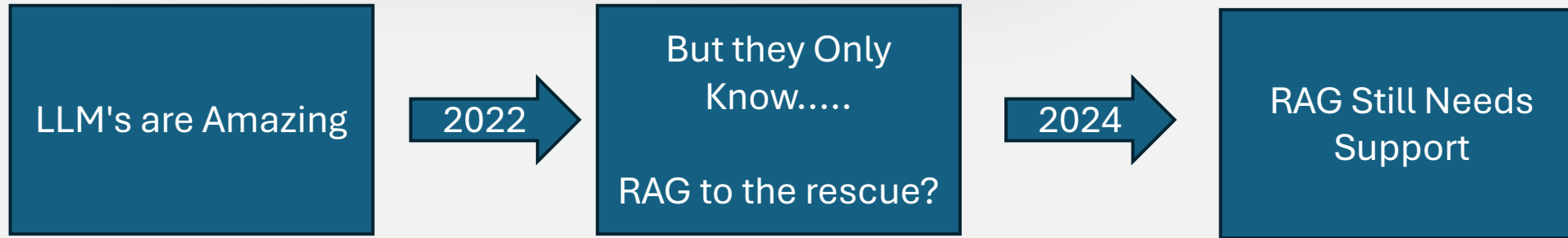
2017 - 2020 : Each Major Jump, quickly absorbed as humans expand on the capabilities. (The "BERT"s)

2020: But what was it about LLM's?

Today: Like Everything Else, LLM's are not only improving but also the supporting architecture.



# Intro: We Are Moving Fast



Highlights:

2020: LLM's Are Amazing!! YEAAA we have AGI! Then people discovered "wait they only know what they know up to a point". Develop/Code/iterations

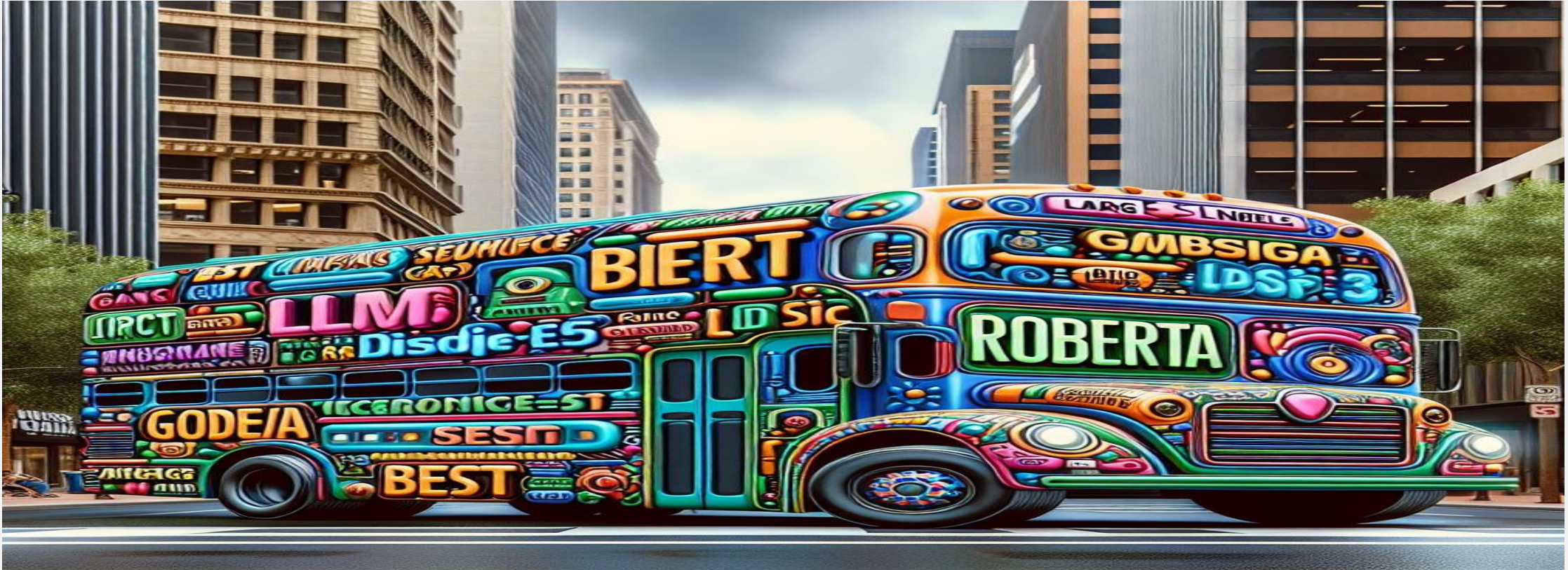
2021-2022: RAG To The Rescue! YEEAAAA We have AGI!! . Ruh Roh – Vector DB, cosine similarity awesome but what about x? Why is this thing lying to me??

2023 – 2024 : We want more insights!! What about things we don't know – KG's!!





# AI Is Here To Stay



The AI Bus Has Arrived



# Dev and PjM, CFO, CIO, CEO Thoughts



LLM's Are Everywhere



How Can I Keep Up In This Market?

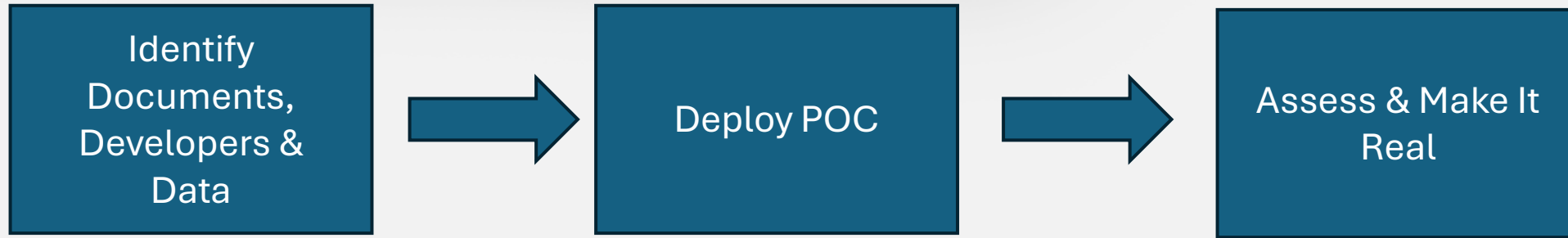


Ideation To POC's Rapidly





# Use Case 1: How Can I Use This?



| Inputs           | Technical Lift | Outputs           |
|------------------|----------------|-------------------|
| Answer The 5 W's | Data Stewards  | POC Goals Defined |
| Gather The Team  | Developers     | Business Decision |

# Use Case 1: Lets Chat with Search!

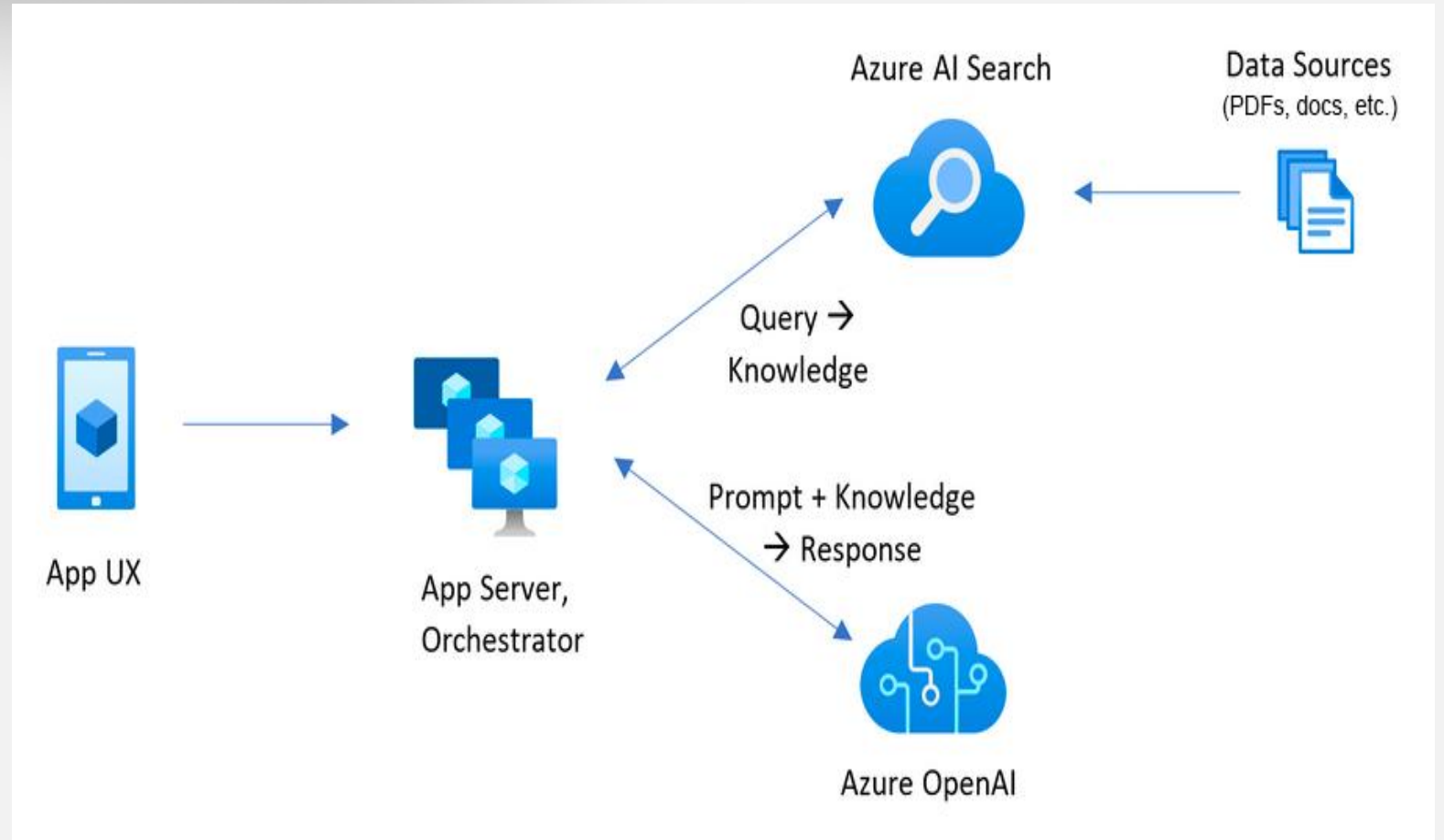
**Outcome:** Web Chat with Q & A Capabilities on internal documents

**Level:** Easy To Moderate

**Tooling:** Dev Tools via Docker, or a dev system. Azure Account, AOAI instance, Azure AI Search, Python knowledge

**Time To Deploy:** Very Short

**Cost:** Minimal, depending on Document intake





# Use Case 1: Demo Time

Demo on Application You Can Deploy!

Deployment Time: 30 Minutes

Value: Priceless!

Link: [Azure-Samples/azure-search-openai-demo: A sample app for the Retrieval-Augmented Generation pattern running in Azure, using Azure AI Search for retrieval and Azure OpenAI large language models to power ChatGPT-style and Q&A experiences.](#)

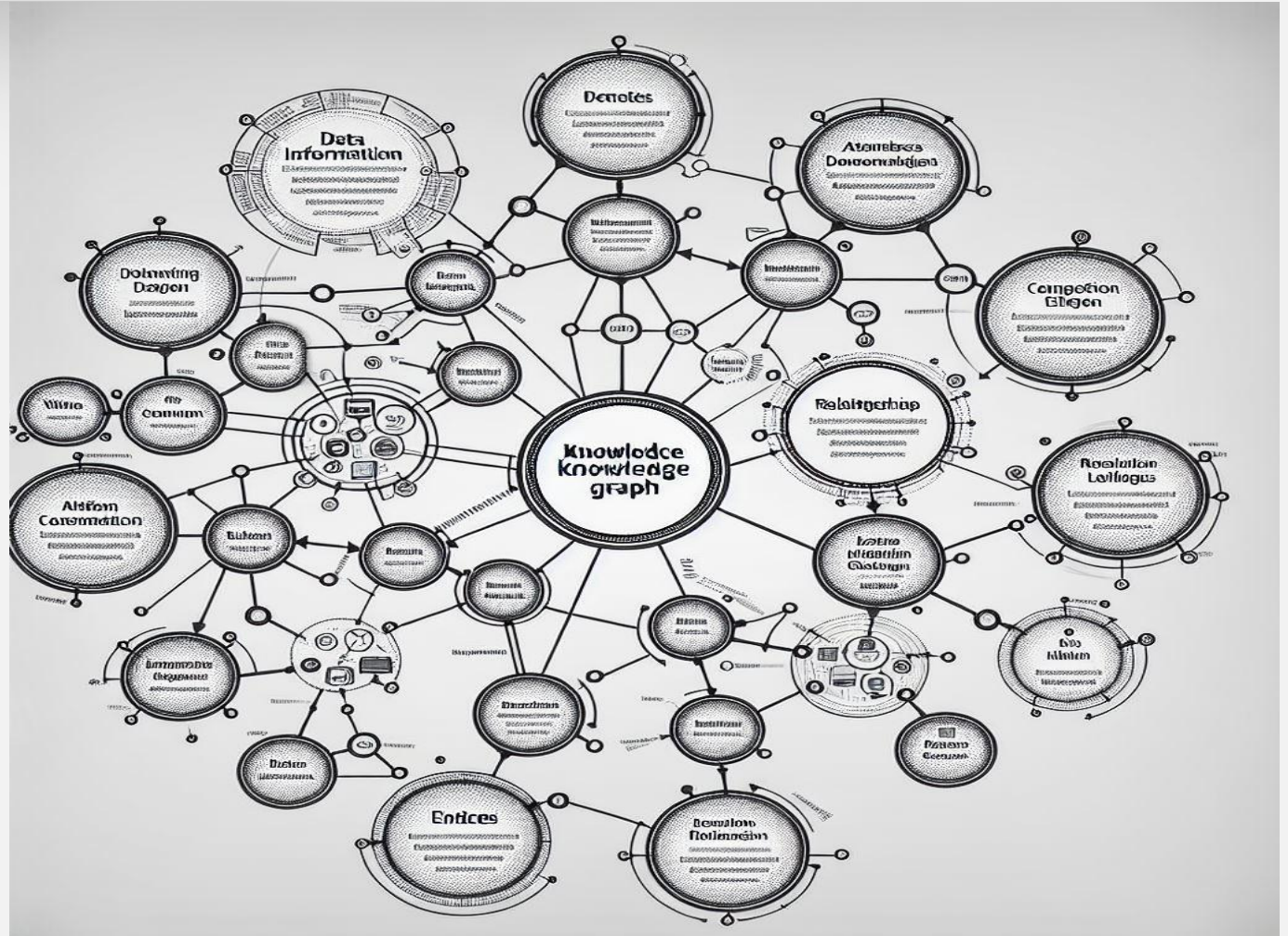


## Use Case 2: Visualize Data Relationships

## Outcome: GraphRAG Implementation supporting insights into your own Data Estate

Level: Moderate to Difficult.

Tooling: Dev Tools via Docker, or a dev system.  
Azure Account, AOAI instance, Azure AI  
Search, Python knowledge, Patience 😊

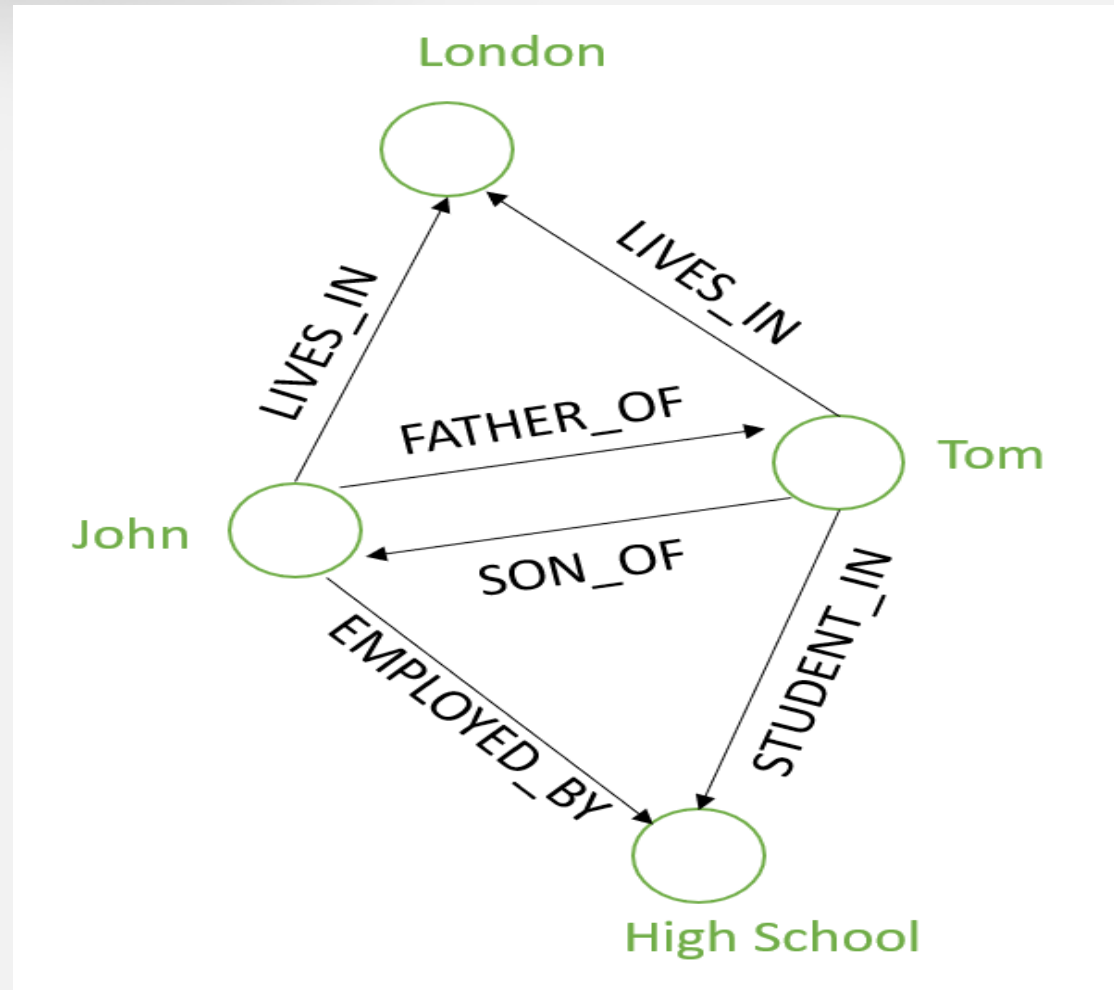


# High Level Graph Example

2 Things To Highlight Here:

**NODES:** The Things/Entities/People/Objects that live in your Data

**RELATIONSHIP:** How They Are Connected



# Use Case 2: GraphRAG Underpinnings

- The LLM processes the entire private dataset, creating references to all **entities and relationships** within the source data, which are then used to create an LLM-generated knowledge graph.
- This graph is then used to create a **bottom-up clustering** that **organizes the data hierarchically** into semantic clusters. This partitioning allows for **pre-summarization of semantic concepts and themes**, which aids in **holistic understanding** of the dataset.
- At query time, **both of these structures** are used to provide materials for the LLM context window when answering a question

**Easily Explained:** GraphRAG relies on storing the Knowledge Base into Graph Databases (Azure Search, Neo4j, chromaDB, Weviate, PGSQL vector). This makes the retrieval phase more efficient. Finding Possibly unseen relationships in your data. So no, "Search is not dead" by any means --> Semantically Speaking.

[GraphRAG: Unlocking LLM discovery on narrative private data - Microsoft Research](#)  
[2404.16130] [From Local to Global: A Graph RAG Approach to Query-Focused Summarization](#)



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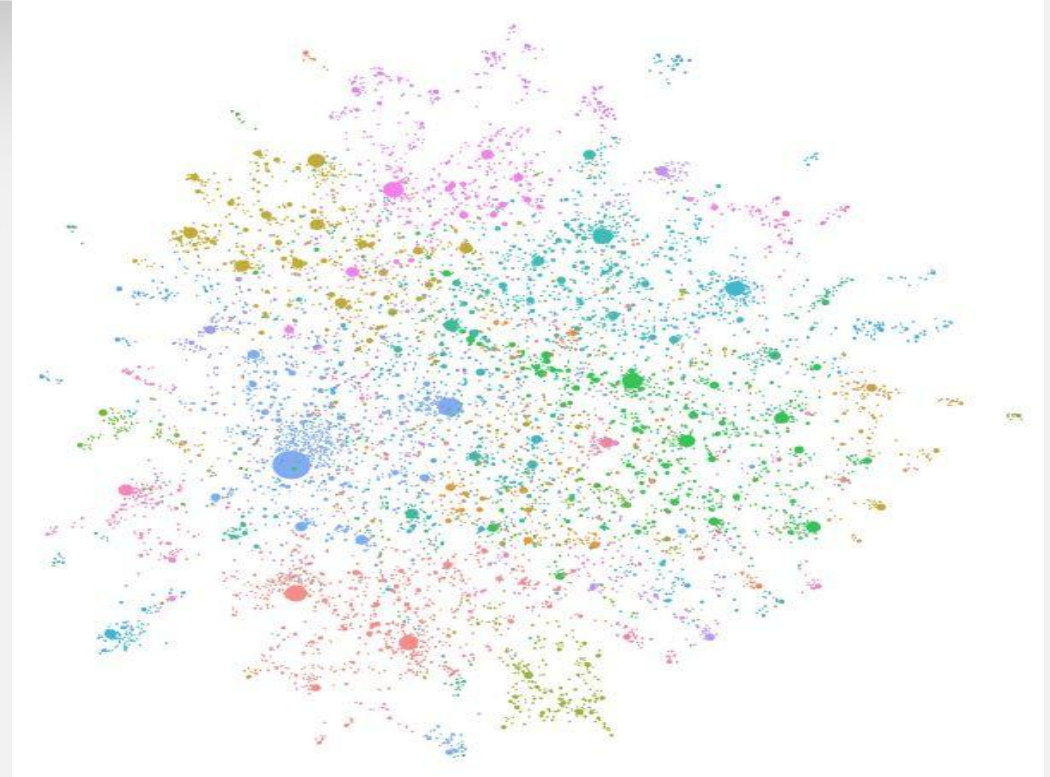
# Use Case 2: What Makes GraphRAG Amazing?

Who Can/Should Participate?

- Everyone: From the CIO To Security To Governance

What Is The Outcome?

- A much more **Human Digestible** and **Human Consumable Representation** of your **Data Estate**.
- Supports **Data& Cyber Security, Data Governance, Data Engineering, Data Processing and Accounting, Insights** You Never Knew Were There



[GraphRAG: Unlocking LLM discovery on narrative private data - Microsoft Research](#)  
[\[2404.16130\] From Local to Global: A Graph RAG Approach to Query-Focused Summarization](#)



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# Use Case 2: What Makes GraphRAG Amazing?

The BIG Question: Why?

- *Data IS The **GOLD** Your **Competitors And Adversaries WANT**. Identity is the means to get it.*
- We Should **Think About Data in Graphs, Not Lists** in Windows Explorer Or the output of a script which produced a csv file to be analyzed in excel. ☹️



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# Use Case 2: Demo Time

~10 Minute Demo on Application You Can Deploy!





# Feedback

Do you want us to follow up after the event? Do you have feedback?



<https://aka.ms/summit/feedback>



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# THANK YOU!

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