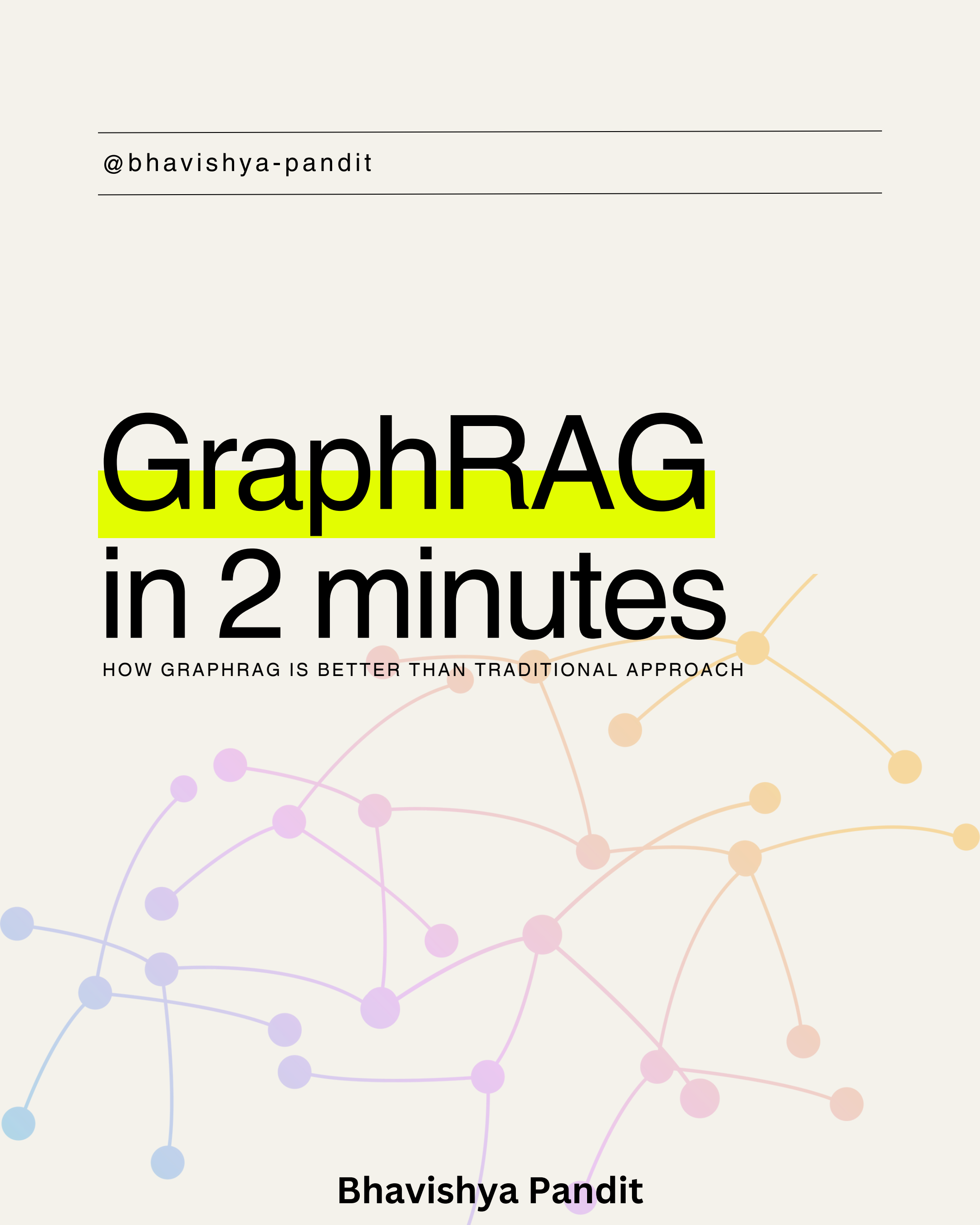
@bhavishya-pandit

# GraphRAG in 2 minutes

HOW GRAPHRAG IS BETTER THAN TRADITIONAL APPROACH

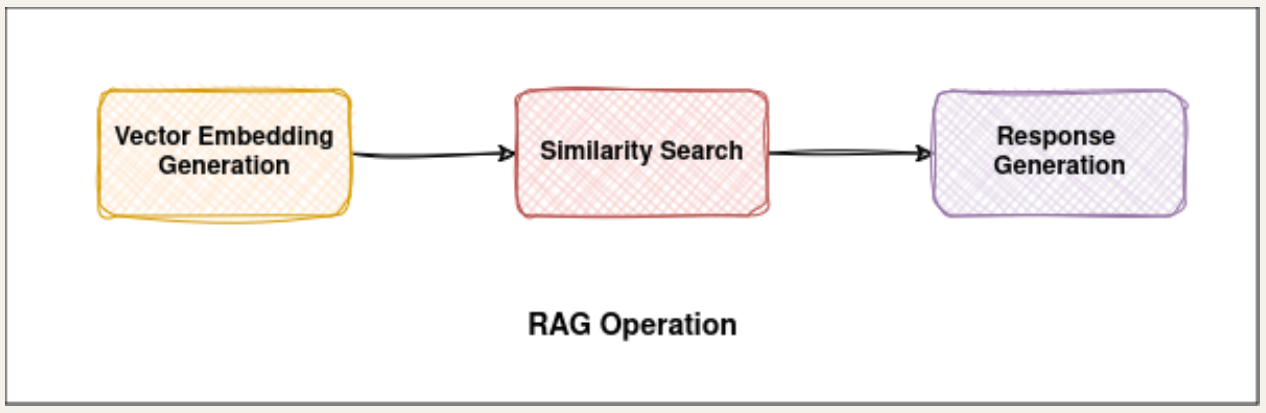


**Bhavishya Pandit**

# Introduction

RAG is the natural language querying approach for enhancing existing LLMs with external knowledge.
Traditional RAG works in broadly three steps:

1. In the first step we process the documents and convert them into vectors.
2. The user query is embedded and through similarity search we find the context.
3. In the last step LLM generates response based on the context and the query.




This approach is widely used but there are some limitations to it:

- The first is Limited Contextual Understanding, as it can sometimes miss the nuances in data due to its reliance on retrieved documents alone.
- Scalability Issues: As the data grows, the retrieval process can become less efficient.
- Complexity: Integrating external knowledge sources can become complex and cumbersome.

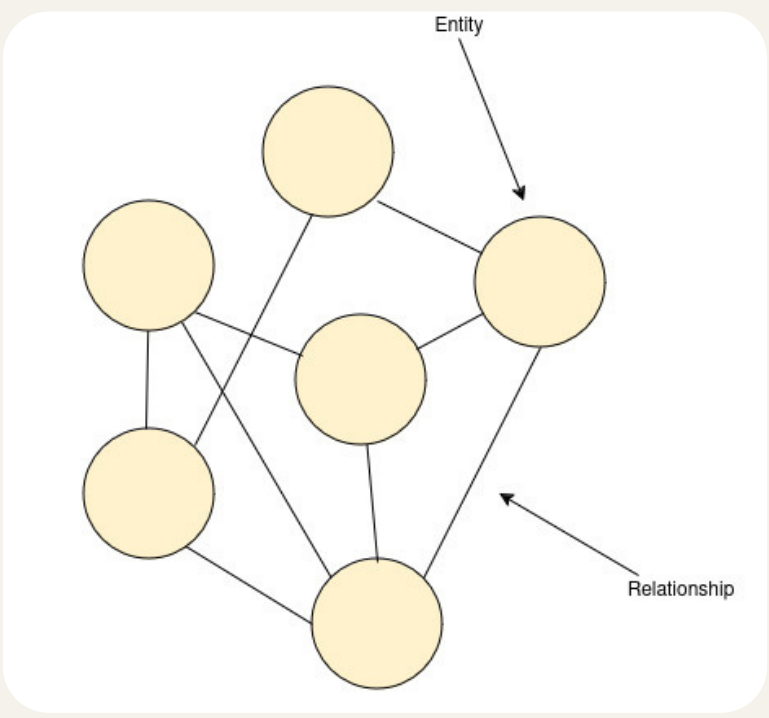
So Microsoft engineered an approach to address these issues known as GraphRAG. Lets understand how it works -

# GraphRAG

Just like RAG, GraphRAG has two phases Indexing phase and query phase.We can divide the entire process into three steps:

**1.Knowledge Graph Generation:** In the first step the text chunks are parallelly processed to extract entities and relationship among these entities and this information is used to create the knowledge graph.

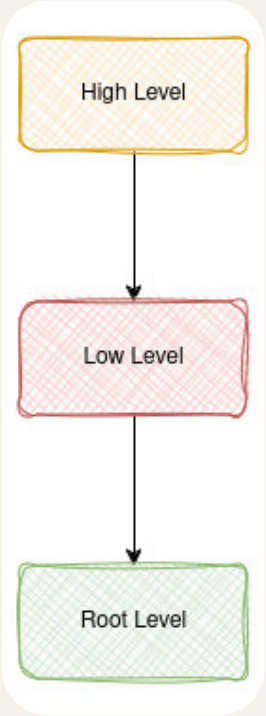
Using the knowledge graph it defines the communities of entities and their summaries which help in identifying the context more accurately.




A knowledge graph represents a network of real-world entities and illustrates relationship between them.

**2.Generating Hierarchical Community Summaries:** The Knowledge Graph is then used to create communities. The paper suggests three community levels(Root Level, Low Level, High Level). The level of community determines the depth of information. Then the communities are summarized to have a holistic overview of the private dataset.

Levels of Communities based on depth of information




**3.Querying:** During the querying phase, the model analyses the request and determines the community level based on the level of details needed. Once the level is determined we generate the response using the respective summary and combine the responses if multiple communities are involved giving the final answer.

Graph RAG has many advantages over traditional RAG like:

1. Reduced Hallucinations
2. Better Explainability
3. Improved Accuracy

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