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Solution Overview

GraphRAG (Graph Retrieval-Augmented Generation) is a cloud-native framework designed for deep semantic understanding of unstructured text. It constructs knowledge graphs from raw documents and leverages Azure OpenAI for multi-hop, context-rich answers. Fully integrated with Azure services, GraphRAG ensures scalability, security, and observability for enterprise-grade environments.

Problem Statement

Organizations store critical policy documents—such as leave rules, codes of conduct, conflict resolution, privacy policies, and workplace trust frameworks—as lengthy PDFs or Word files. Extracting accurate, contextual answers is challenging due to:

- Questions spanning multiple document sections

- Ambiguous or nested terms
- Frequent policy updates

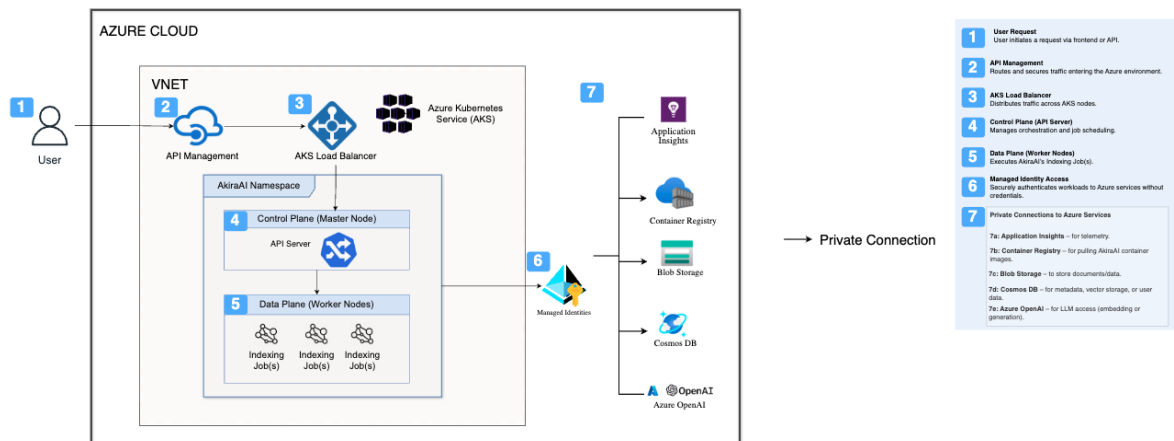
Traditional search methods struggle to handle this complexity effectively.

Solution Detail

GraphRAG transforms static documents into dynamic knowledge systems through:

- **Graph Construction:** Maps entities (e.g., leave types, approval hierarchies, trust indicators) into a structured graph.
- **Community Clustering:** Groups related concepts (e.g., policies under “Workplace Trust” or “Attendance”).
- **Hybrid Retrieval:** Combines local (section-specific) and global (theme-wide) understanding.
- **Azure-Native Deployment:** Ensures scalability, security, and observability within enterprise IT environments.

Technical Architecture



All services interact securely via VNET and Private Endpoints.

Key Components

- **Compute:** Azure Kubernetes Service (AKS) for scalable processing
- **Storage:** Azure Blob Storage for document storage
- **Graph/Vector DB:** Azure Cosmos DB for structured data
- **Embedding/LLM:** Azure OpenAI for embeddings and reasoning

- **Authentication:** Azure Managed Identity for secure access
- **Monitoring:** Azure Monitor and Application Insights for observability
- **DevOps:** Azure Container Registry for container management
- **Networking:** Azure Private Endpoints and VNET for secure connectivity

Integration Points

GraphRAG integrates seamlessly with:

- Azure OpenAI for language model capabilities
- Azure Cosmos DB for graph and vector storage
- Azure Blob Storage for raw document storage
- Azure Monitor for performance and usage tracking

Use Cases

- Employee self-service for policy queries
- HR team support for compliance and onboarding
- Legal teams analyzing policy alignment
- Cultural alignment through trust and ethics exploration

Customer Pain Points Addressed

- Slow and error-prone manual policy searches
- Misinterpretation of complex policy documents
- High HR workload for repetitive queries
- Inconsistent answers across distributed teams

Industry-Specific Applications

- **Human Resources:** Streamlined policy navigation
- **Legal:** Compliance and audit support
- **Education:** Policy and guideline dissemination
- **Healthcare:** Regulatory document management

Sample Customer Journey

1. Employee queries “Can I take unpaid leave during probation?”
2. GraphRAG routes query via API Gateway to Cosmos DB

- 3. System retrieves relevant policy clause from Blob Storage
- 4. Azure OpenAI generates a concise, accurate response
- 5. Employee receives answer in under 2 seconds

Technical Requirements

- Azure subscription with access to AKS, Cosmos DB, and OpenAI
- Minimum 100 GB Blob Storage
- VNET and Private Endpoints configured
- Azure Monitor for logging and diagnostics

Security Architecture

- **Authentication:** Azure Managed Identity for secure access
- **Networking:** Private Endpoints and VNET for isolated communication
- **Data Protection:** Encryption at rest and in transit
- **Auditing:** Azure Monitor for compliance tracking

Performance Considerations

- **Latency:** Local queries < 2 seconds, global summaries 5–7 seconds
- **Scalability:** AKS auto-scaling for high query volumes
- **Cost Optimization:** 30–40% savings via hybrid pruning

Tools and Azure Services Used

Layer	Technology
Compute	Azure Kubernetes Service (AKS)
Storage	Azure Blob Storage
Graph/Vector DB	Azure Cosmos DB
Embedding/LLM	Azure OpenAI
Authentication	Azure Managed Identity
Monitoring	Azure Monitor & Application Insights
DevOps	Azure Container Registry
Networking	Azure Private Endpoints + VNET

Users of Agent

- Employees seeking policy clarification
- HR professionals managing compliance
- Legal teams auditing policy adherence
- IT administrators overseeing deployment

Dependencies

- Azure OpenAI API availability
- Cosmos DB graph API compatibility
- Blob Storage for document ingestion
- AKS cluster with sufficient compute resources

Key Benefits and Differentiators

- Fast, accurate policy query resolution
- Reduced HR workload through self-service
- Prevention of policy misinterpretation
- Scalable and secure Azure-native deployment
- 94% retrieval accuracy (verified by HR SMEs)

Value Proposition

GraphRAG delivers a smart, scalable, and secure solution for transforming static policy documents into dynamic, queryable knowledge systems, enhancing employee experience and operational efficiency.

Conclusion

By leveraging graph intelligence, hybrid retrieval, and Azure OpenAI, GraphRAG on Azure provides a robust foundation for policy exploration, compliance support, and cultural onboarding. It empowers organizations to unlock the full potential of their unstructured data with precision and efficiency.