



ontotext

THE GRAPHDB COMPANY

KNOWLEDGE GRAPHS,
SEMANTIC METADATA AND
LLMS AT WORK FOR
MARKETING CONTENT

Krasimira Bozhanova, Teodora Petkova

SEMANTiCS 2023

21.09.2023

- Who are we?
- Why aim towards Knowledge-Graph Powered Marketing?
- What is the Ontotext Knowledge Graph?
- How to integrate LLMs with KGs and Semantic Metadata for more efficient knowledge exploration?

Ontotext at a Glance

- **Products**

- **GraphDB** - the best knowledge graph database
- **Ontotext Refine** - enrich KGs from structured data
- **Ontotext Metadata Studio** - enrich KGs from unstructured data

- **Services**

We build solutions around:

- Crafting and evolving knowledge graphs, interlinking open and proprietary data
- Applying text mining to enrich knowledge graphs and gain insights

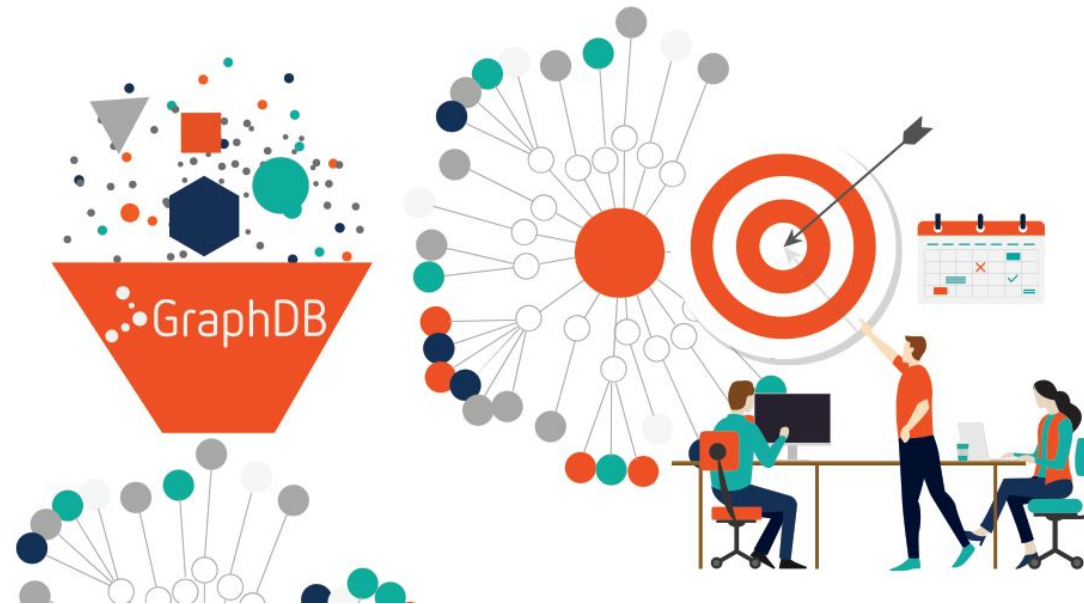




Paradigm shift you say?

Shifting One Paradigm At a Time

Knowledge-graph powered marketing communication



Shifting One Paradigm At a Time

500 059 Triples | 6 taxonomies | 3 ontologies | 1273 documents | 32 500 annotations



The Benefits of Knowledge Graph-Powered Marketing

1. **CONTENT MANAGEMENT**: We find, navigate, use and reuse content efficiently
2. **SEO**: We publish semantically annotated content for better visibility in search at a lower cost
3. **KNOWLEDGE MANAGEMENT platform**: We work to create structured content for products, services, technologies, events, people and projects.

All this to serve both internal and external audiences.



And just like that...

We set ourselves in the position to talk to our content (help LLMs help us :)



*Help me **turn my content into organized knowledge** and make it **easily accessible** and **understandable** to users*

❖ Knowledge Representation

*Help me **turn my content into organized knowledge** and make it **easily accessible** and **understandable** to users*

*Help me **turn my content into organized knowledge** and make it **easily accessible** and **understandable** to users*

❖ Knowledge Representation

- Ability to define domain vocabulary
- Tag content with semantic metadata
- Breakdown and store knowledge

Ontotext Knowledge Graph



*Help me **turn my content into organized knowledge** and make it **easily accessible** and **understandable** to users*

❖ Knowledge Representation

- Ability to define domain vocabulary
- Tag content with semantic metadata
- Breakdown and store knowledge

❖ Knowledge Exploration

*Help me **turn my content into organized knowledge** and make it **easily accessible** and **understandable** to users*

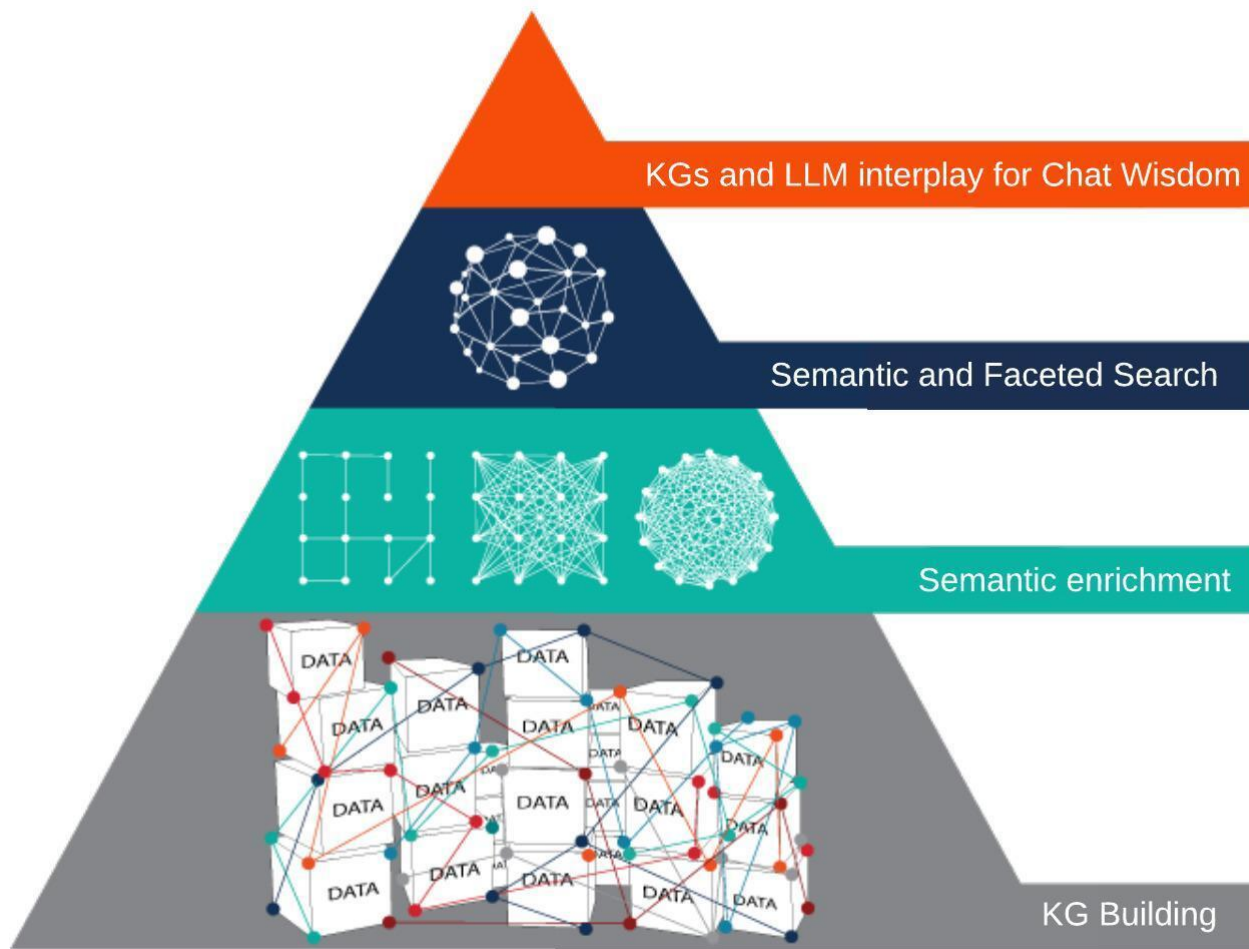
❖ Knowledge Representation

- Ability to define domain vocabulary
- Tag content with semantic metadata
- Breakdown and store knowledge

❖ Knowledge Exploration

- Precision search combining FTS with graph query
- State-of-the-art LLM chat
- User intent at the center of information exploration

Task Breakdown



Search

Filters

Clear All

> Resource Type

> Industry

> Topic

> Product

> Application Area

> Audience

> Capability

> Publication Date

> Author

Marketing Resources

Chat

Analytics

Ask Ontotext Chat

Question: *

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

Plain ChatGPT Answer

Ontotext Knowledge Graph Answer

The link between SEMANTiCS and Wittgenstein is that both involve the concept of knowledge graphs. In the context of SEMANTiCS, knowledge graphs are used to represent and integrate information from various sources, such as technical documentation and content. This aligns with Wittgenstein's early thinking about the world consisting of statements and sentences, where the whole world can be seen as a knowledge graph. The reference to Wittgenstein's philosophy emphasizes the idea that knowledge graphs can provide a comprehensive representation of information and enable better understanding and connectivity between different concepts and datasets.

Search

Filters

Clear All

- > Resource Type
- > Industry
- > Topic
- > Product
- > Application Area
- > Audience
- > Capability
- > Publication Date
- > Author

Marketing Resources

Chat

Analytics

Found 652 matches

Next-Gen Graph Technology: A CDO Matters Podcast with Ontotext's CMO Doug Kimball



BLOG POST

SEPTEMBER 08, 2023

DOUG KIMBALL

CDO Matters' Malcolm Hawker talks with Doug Kimball about knowledge graphs, enterprise data challenges, ChatGPT, data fabric, and more

The Importance of the Semantic Knowledge Graph



Ontotext's GraphDB Solution Now Available in the AWS Marketplace



NEWS ARTICLE

SEPTEMBER 06, 2023

Ontotext announces that its core product, GraphDB, is now available in the AWS Marketplace to support cloud data migration

Data Integration Patterns in Knowledge Graph Building with GraphDB



Search

Filters

Clear All

- > Resource Type
- > Industry
- > Topic
- > Product
- > Application Area
- > Audience
- > Capability
- > Publication Date
- > Author

Marketing Resources

Chat

Analytics

Ask Ontotext Chat

Question: *

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

Search

Filters

Clear All

- > Resource Type
- > Industry
- > Topic
- > Product
- > Application Area
- > Audience
- > Capability
- > Publication Date
- > Author

Marketing Resources

Chat

Analytics

Ask Ontotext Chat

Question: *

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

Search

Filters

Clear All

- > Resource Type
- > Industry
- > Topic
- > Product
- > Application Area
- > Audience
- > Capability
- > Publication Date
- > Author

Marketing Resources

Chat

Analytics

Ask Ontotext Chat

Question: *

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

Industry: Manufacturing

Search

Enter search term here

Filters

[Clear All](#)

> Resource Type

▼ Industry 1

Search for Industry



- ▼ Industry 508
 - Infrastructure 108
 - Manufacturing 52
 - Energy 37
 - Automotive 11
 - Aerospace 8
- ▶ Media and Publishing 410

> Topic

> Product

Marketing Resources

Chat

Analytics

Ask Ontotext Chat

Question: *

Type anything you would like to ask and press enter

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

- > Resource Type
- > Industry 1
- > Topic
- > Product
- > Application Area
- > Audience
- > Capability
- ▼ Publication Date

Min. Range: 2021-11-18 Max. Range: 2023-05-26

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

Industry: Manufacturing Publication Date: 2021 - 2023

Search

Enter search term here

Filters Clear All

- > Resource Type
- > Industry 1
- > Topic
- > Product
- > Application Area
- > Audience
- > Capability
- > Publication Date 2021 - 2023
- > Author

Marketing Resources

Chat

Analytics

Ask Ontotext Chat

Question: *

What are the main benefits of the adoption of the Ontotext technologies in the manufacturing industry?

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

Plain ChatGPT Answer

Ontotext Knowledge Graph Answer

Please wait...

Industry: Manufacturing x

Publication Date: 2021 - 2023 x

Search

Enter search term here

Filters Clear All

- > Resource Type
- > Industry 1 x
- > Topic
- > Product
- > Application Area
- > Audience
- > Capability
- > Publication Date 2021 - 2023 x
- > Author

Marketing Resources

Chat

Analytics

Ask Ontotext Chat

Question: *

What are the main benefits of the adoption of the Ontotext technologies in the manufacturing industry? ✓

Note: The results from the search aren't deterministic, because Ontotext Chat uses ChatGPT. The latter doesn't always return the same answer.

Note: It may take some time for the result to show up. Ontotext Chat depends on ChatGPT performance.

Plain ChatGPT Answer Ontotext Knowledge Graph Answer

⚙ Please wait...

Plain ChatGPT Answer

As an AI, I don't have personal knowledge but based on available information, the adoption of Ontotext technologies in the manufacturing industry can offer several benefits:

1. **Enhanced Data Management:** Ontotext's semantic technology allows for better data integration, management, and analysis. This can help manufacturing companies to better understand and utilize their data.
2. **Improved Decision Making:** By providing a more comprehensive view of data, Ontotext can support better decision-making processes, helping to improve efficiency and productivity.
3. **Cost Reduction:** By improving data management and decision-making, Ontotext can help to reduce costs in the manufacturing process.
4. **Innovation:** Ontotext's technology can support innovation by enabling more effective use of data, which can lead to the development of new products and processes.
5. **Risk Management:** By providing a more comprehensive view of data, Ontotext can help companies to better identify and manage risks.
6. **Compliance:** Ontotext's technology can help manufacturing companies to comply with regulatory requirements by providing a more effective way to manage and analyze data.

Ontotext Knowledge Graph Answer

The main benefits of adopting Ontotext technologies, particularly the RDF database for knowledge graphs, GraphDB, in the manufacturing industry include:

1. **Improved Asset Management:** Knowledge graphs provide insights into the performance of different systems and processes, significantly improving asset management.
2. **Enhanced Equipment Maintenance:** The technology helps in better equipment maintenance by providing detailed insights and predictive analysis.
3. **Optimized Factory Floor Management:** Knowledge graphs can optimize factory floor management by analyzing and improving various processes.
4. **Increased Industrial Safety:** The technology can also enhance industrial safety by identifying potential risks and suggesting preventive measures.
5. **Improved Operations:** Many leading auto part makers, car manufacturers, and computer manufacturers use Ontotext's GraphDB to improve their operations.
6. **Digital Transformation:** The technology supports the adoption of Industry 4.0 and other technologies for the digital transformation of manufacturing systems.
7. **Seamless Data Integration:** Ontotext's technology enables seamless data integration, unification, analysis, and sharing across various systems.
8. **Support for Self-Driving Cars:** Knowledge graphs can support the development of self-driving cars by modeling and optimizing the interactions between various computers.
9. **Creation of Digital Twins:** The technology can enable the creation of digital twins, which make sense of the collected data from various sensors in different systems, spanning the entire vehicle lifecycle.
10. **Efficient and Stable Performance:** GraphDB provides predictable performance across a wide range of workloads, ensuring great efficiency and stability.

10. Efficient and Stable Performance: GraphDB provides predictable performance across a wide range of workloads, ensuring great efficiency and stability.

11. Significant Cut Down of Time and Resources: The technology significantly reduces the time and resources required for modeling and managing changes to the model.

12. Improved Positioning: Providing an easier and quicker way to implement systems improves the positioning of the manufacturers.

13. User-Friendly: Ontotext's technology is designed to be user-friendly, making it easier for engineers and IT people to develop their applications.

Explore further the following main topics:

1. Knowledge Graph: How does Ontotext's GraphDB use knowledge graphs to improve asset management and equipment maintenance in the manufacturing industry?

2. Manufacturing: Can you provide more examples of how Ontotext's technologies have been used to optimize factory floor management and improve operations in the manufacturing industry?

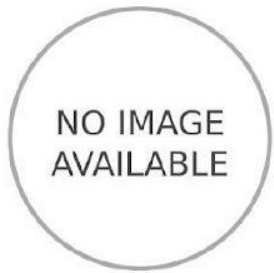
3. Data Representation: How does Ontotext's technology enable seamless data integration and representation across various systems in the manufacturing industry?

4. Industry: How does the adoption of Ontotext's technologies support the digital transformation and adoption of Industry 4.0 in the manufacturing sector?

5. Connected Inventory: How can Ontotext's technologies, like the creation of digital twins, improve connected inventory management in the manufacturing industry?

Learn the Basics:

Knowledge Graph Applications

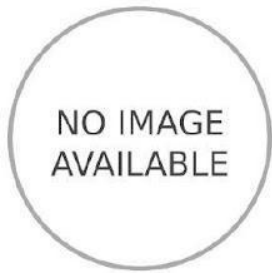


FUNDAMENTAL

AUGUST 29, 2022

We can help you provide consistent unified access to data across different systems by using knowledge graphs

Building Automation Systems



FUNDAMENTAL

AUGUST 18, 2022

Show transparency, foster collaboration and innovation, and empower public trust with Linked Open Data. See more here.

Success Stories:

Ontotext GraphDB Powers Two of the Top Ten Building Automation Systems Manufacturers



CASE STUDY

AUGUST 18, 2022

Two of the leading BAS manufacturers selected Ontotext GraphDB as the best choice to take advantage of the Brick schema

Ontotext Helps A Global Cleaning Products Manufacturer Identify Complex Relationships in the Surfactants Domain



CASE STUDY

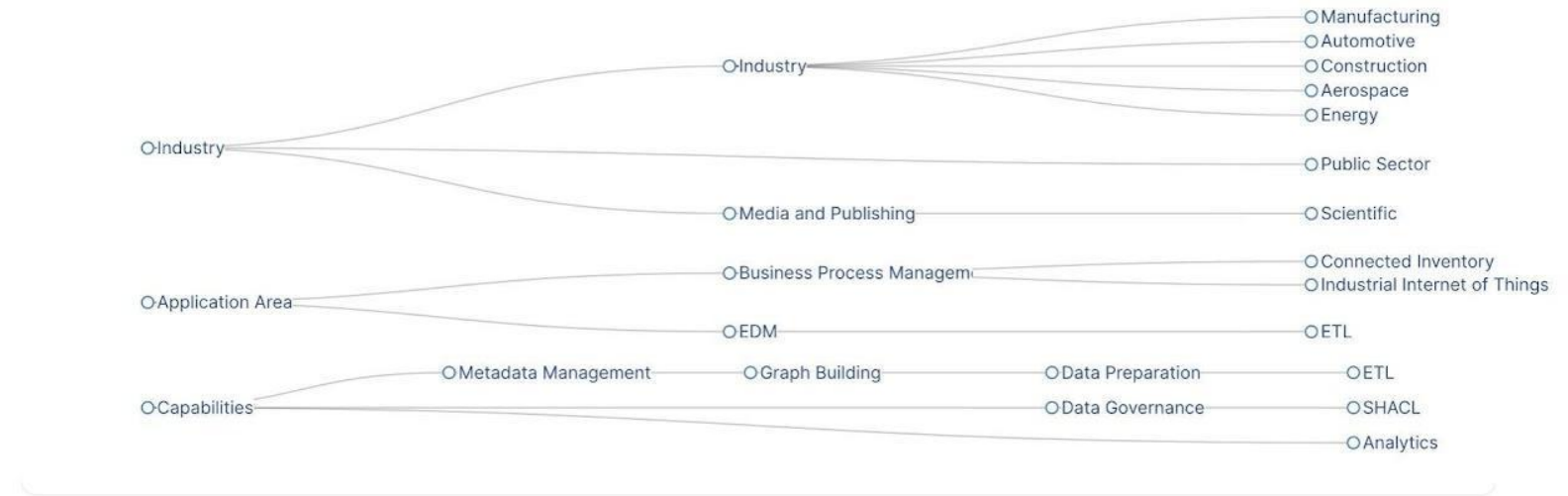
NOVEMBER 05, 2020

Ontotext enabled a global manufacturer of home care and household cleaning products to conduct smarter research on surfactants and skin interactions.

- 10. Efficient and Stable Performance: GraphDB provides predictable performance across a wide range of workloads, ensuring great efficiency and stability.
- 11. Significant Cut Down of Time and Resources: The technology significantly reduces the time and resources required for modeling and managing changes to the model.
- 12. Improved Positioning: Providing an easier and quicker way to implement systems improves the positioning of the manufacturers.
- 13. User-Friendly: Ontotext's technology is designed to be user-friendly, making it easier for engineers and IT people to develop their applications.

Explore further the following main topics: >

Related Topics Graph:



▼ Click to collapse

Bridging the Gap Between Industries: The Power of Knowledge Graphs - Part I



BLOG POST **APRIL 07, 2023** **NIKOLAY KRUSTEV**

➤ Chunks

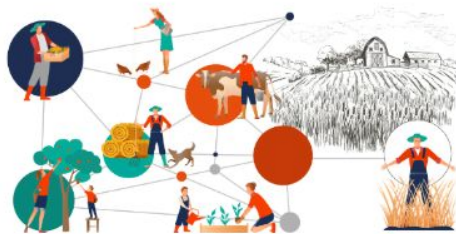
KGF22: Knowledge Graphs and The Not So Quiet Cognitive Revolution



BLOG POST **OCTOBER 07, 2022** **TEODORA PETKOVA**

➤ Chunks

It Takes A Village To Raise An Enterprise Knowledge Graph



BLOG POST **AUGUST 05, 2022** **TEODORA PETKOVA**

➤ Chunks

Ontotext GraphDB Powers Two of the Top Ten Building Automation Systems Manufacturers



CASE STUDY **AUGUST 18, 2022**

➤ Chunks

The Synergy between LLMs and KGs

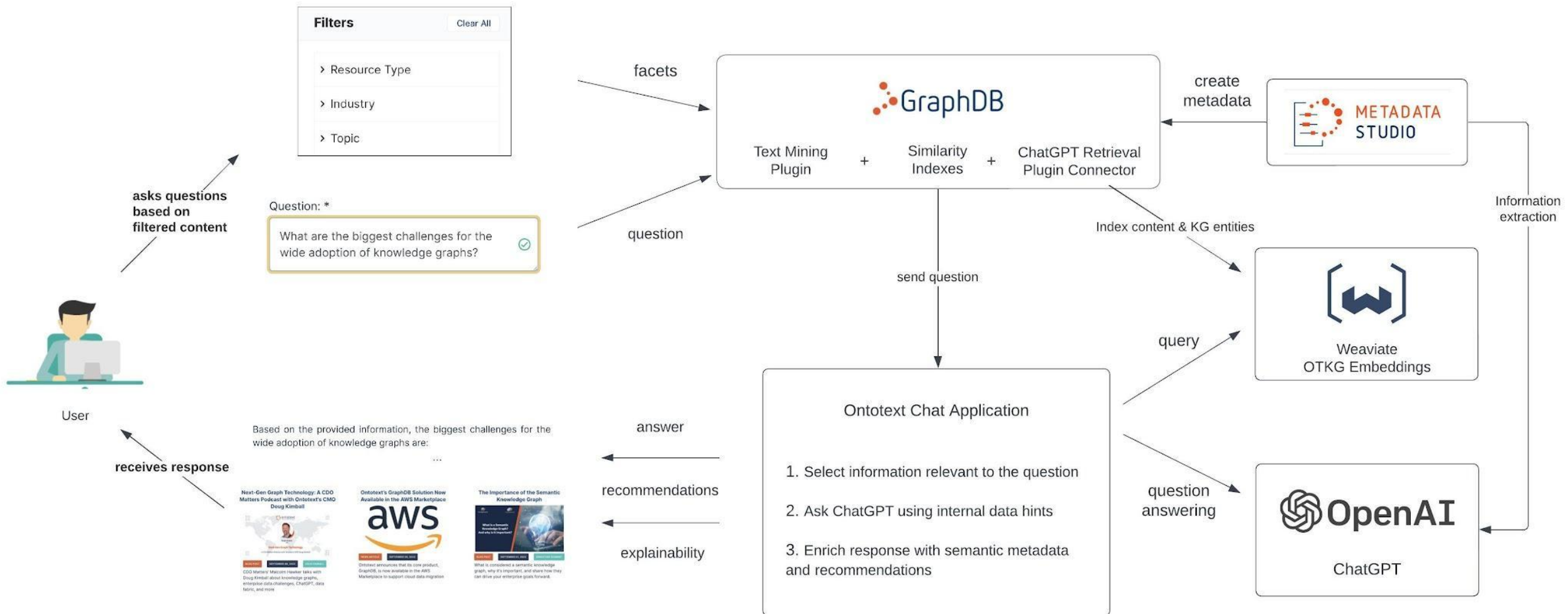
Problem

- ❖ LLMs are limited to public knowledge
- ❖ Lack of trustworthiness:
Hallucinations & unreliability
- ❖ LLMs are Black-Box Models:
No traceability, no explainability

Solution

- ❖ Enhance LLM with your own structured and unstructured data
- ❖ Provide the LLM with reliable grounding context
- ❖ Provide traceability for the sources of the generated answer

Making the Paradigm Shift Happen



Problem

- ❖ Handle large text
 - Lost context after splitting into chunks
 - Noise in original text
- ❖ “The NASA problem”
 - Challenges to match user question to content embeddings
- ❖ Query limitations
 - Difficulty answering questions that require broader view over the data

Solution

- ❖ Reference resolution
- ❖ Targeted information retrieval
- ❖ Query expansion
- ❖ Content enrichment
- ❖ Vector embeddings of KG entities
- ❖ NLQ along the way...

- **LLMs and KGs** can be integrated successfully for **real-world applications**
- **Knowledge graphs** combined with **semantic metadata** enhance **LLMs** for better content discovery, understanding and question-answering.
- Innovative approaches **elevate the value** of the marketing content we produce and unlock the potential for **powerful knowledge-driven insights**.



Thank you
for your time!

teodora.petkova@ontotext.com
krasimira.bozhanova@ontotext.com

www.ontotext.com