

Data Science Nürnberg #11

November 9, 2023



NÜRNBERG DATA SCIENCE



April 2022

October 2023



Thanks to our Hosts



inovex

WhatsApp Group

- Announcements for all events
- Discussion channels for specific topics

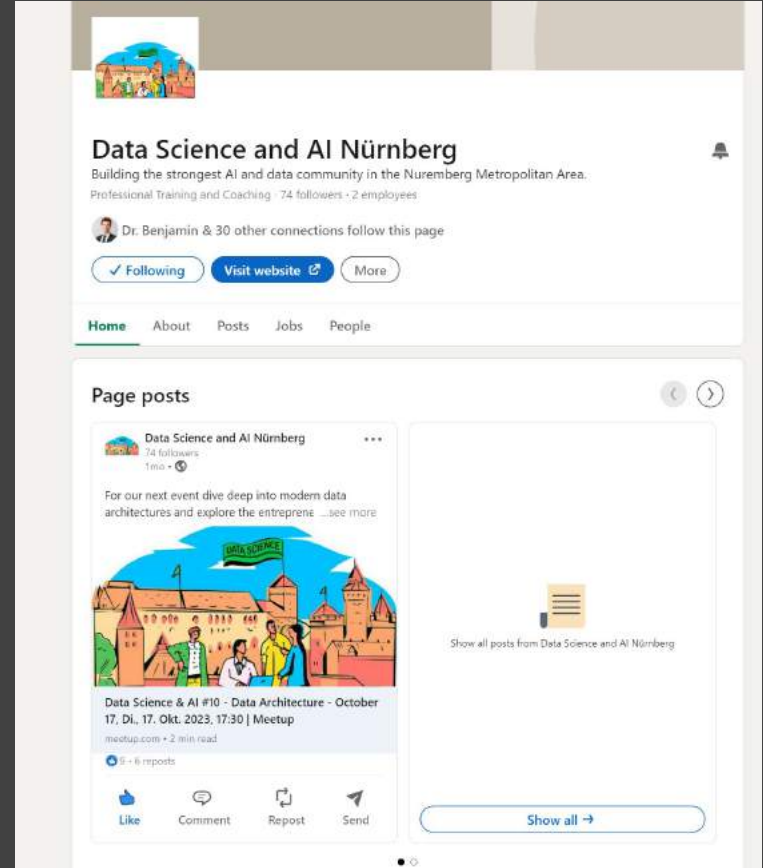
How?

- Open WhatsApp
- Click Camera Icon and scan QR code.




LinkedIn Page

<https://www.linkedin.com/company/data-science-ai-nurnberg>



The screenshot shows the LinkedIn profile of 'Data Science and AI Nürnberg'. The profile picture is a colorful illustration of a city with a 'DATA SCIENCE' banner. The page header includes the company name, a tagline 'Building the strongest AI and data community in the Nuremberg Metropolitan Area.', and details about professional training and coaching. Below this, it shows that Dr. Benjamin and 30 other connections follow the page, with buttons for 'Following', 'Visit website', and 'More'. A navigation bar at the top of the content area includes 'Home', 'About', 'Posts', 'Jobs', and 'People'. The main content area is titled 'Page posts' and features a post from the company. The post text reads: 'For our next event dive deep into modern data architectures and explore the entreprens ...see more'. Below the text is the same colorful city illustration. The post title is 'Data Science & AI #10 - Data Architecture - October 17, Di., 17. Okt. 2023, 17:30 | Meetup', with a link to 'meetup.com' and a '2 min read' indicator. It also shows '5 · 6 reposts'. At the bottom of the post are icons for 'Like', 'Comment', 'Repost', and 'Send'. To the right of the post is a placeholder for more content with a 'Show all posts from Data Science and AI Nürnberg' button. At the bottom right of the page is a 'Show all →' button.



Data Science and AI Nürnberg 



Building the strongest AI and data community in the Nuremberg Metropolitan Area.
Professional Training and Coaching · 74 followers · 2 employees

Dr. Benjamin & 30 other connections follow this page


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Page posts  

Data Science and AI Nürnberg 
74 followers
1mo · 

For our next event dive deep into modern data architectures and explore the entreprens ...see more



Data Science & AI #10 - Data Architecture - October 17, Di., 17. Okt. 2023, 17:30 | Meetup
meetup.com · 2 min read
5 · 6 reposts

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Show all posts from Data Science and AI Nürnberg

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Welcome to our Meetup



inovex is an IT project center driven by innovation and quality, focusing its services on 'Digital Transformation'.

Our current focus:

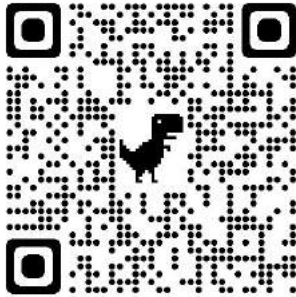
- Agile Transformation
- Product Development Workshops
- E-Health
- Recommender Systems
- Generative AI





Enjoy your time here – stay in contact!

inovex Meetups



meetup.com/inovex-meetup-erlangen

Podcast



Available on all platforms:
Spotify, Overcast, Pocket Casts, ...

Social Media

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Upcoming Events



- **14.11.23: ASQF Fachgruppe People, Projects & Processes**

- Training from the Back of the Room!
65 Wege in Trainings Raum fürs Lernen zu schaffen
- Ab 18 Uhr @ inovex



- **16.11.23: Rust Franken**

- Dynamic und Static Dispatch in Rust
- WebAssembly Workloads für Docker mit Rust
- Ab 18 Uhr @ inovex



Agenda

Building LLM Applications and Games

17:30 Uhr | Doors open and greeting (Lukas Spranger, Benjamin Linnik)

18:00 Uhr | How to build LLM Applications with Haystack (Thomas Jonas, Mai Phuong Mai)

18:45 Uhr | Pizza Break

19:30 Uhr | Master of Art Forgery (Pascal Fecht)

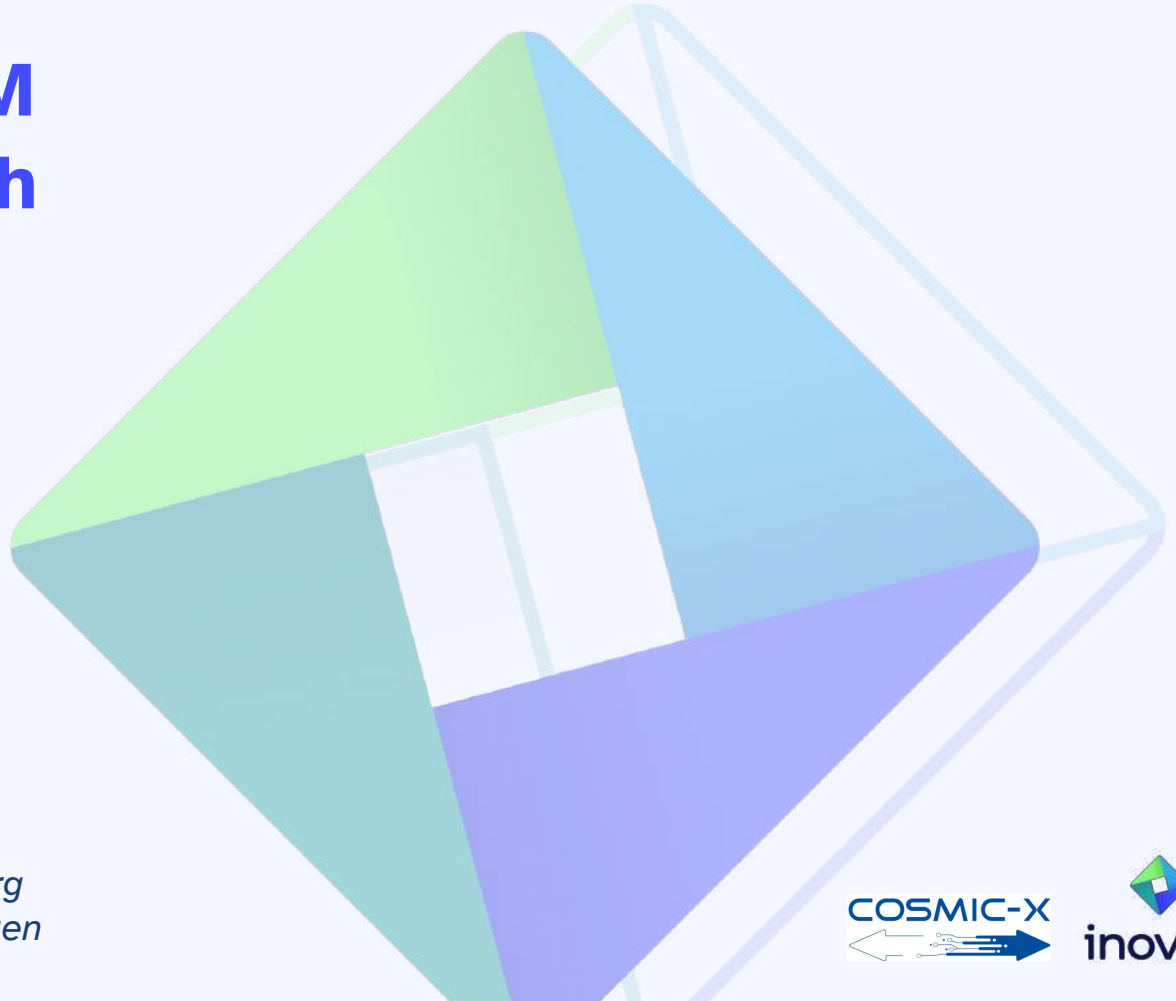
20:15 Uhr | Closing, drinks & music

How to build LLM Applications with Haystack

09. November 2023

Team inovex

Karlsruhe · Köln · München · Hamburg
Berlin · Stuttgart · Pforzheim · Erlangen



Customer Use Case



“Machine X12 is making strange noise”

Company Data



internal knowledge



documentation



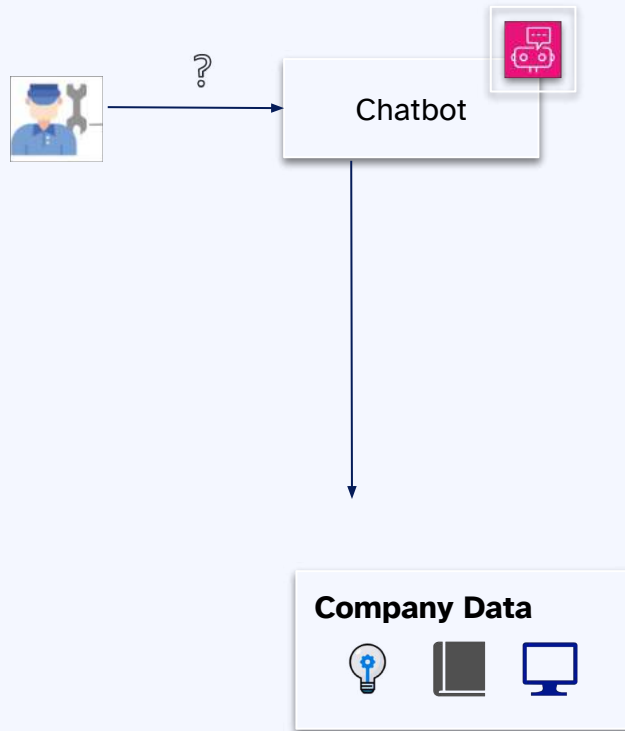
company sources



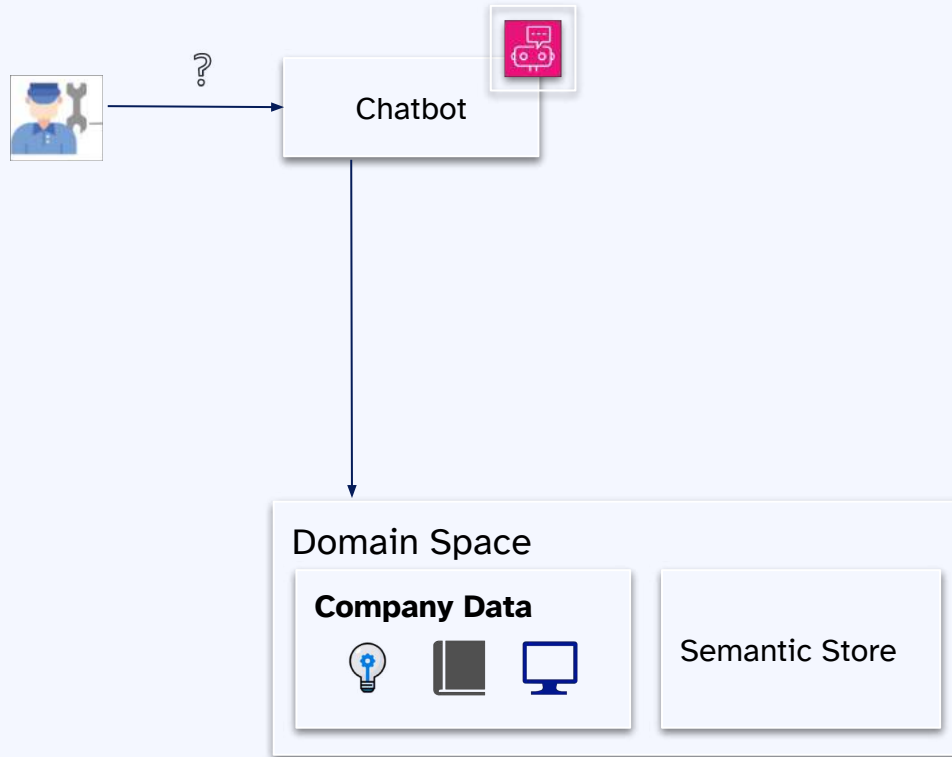
“Machine X12 is emitting a high-pitched screeching noise during the second phase of production.”

→ We need **semantic search** in order to get a precise answer on a domain query

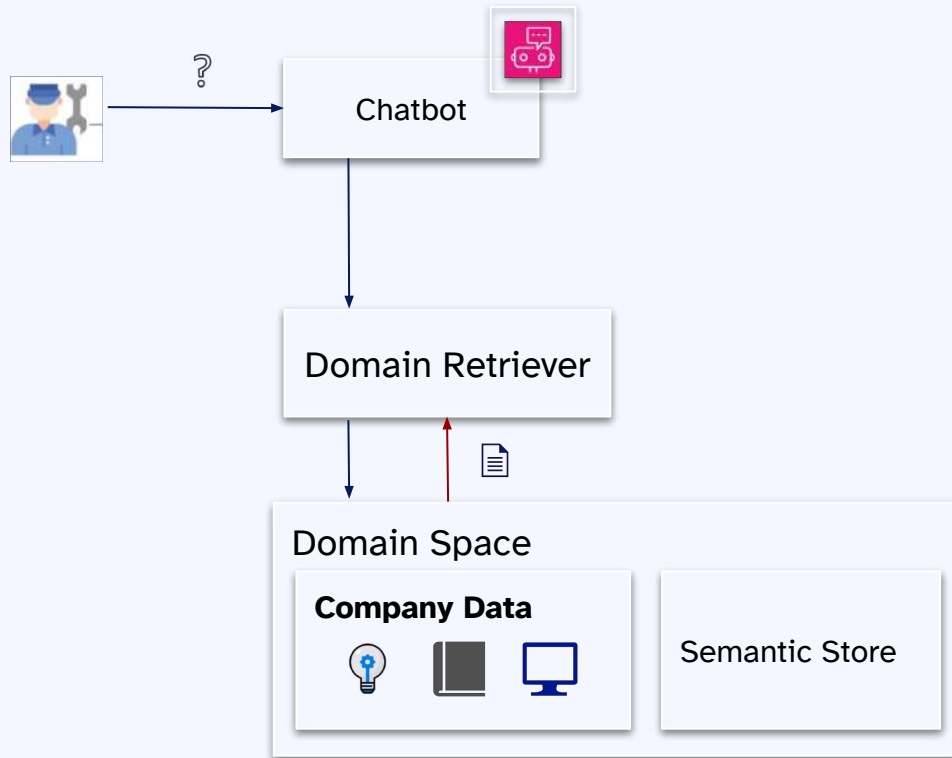
Leveraging domain knowledge



Leveraging domain knowledge

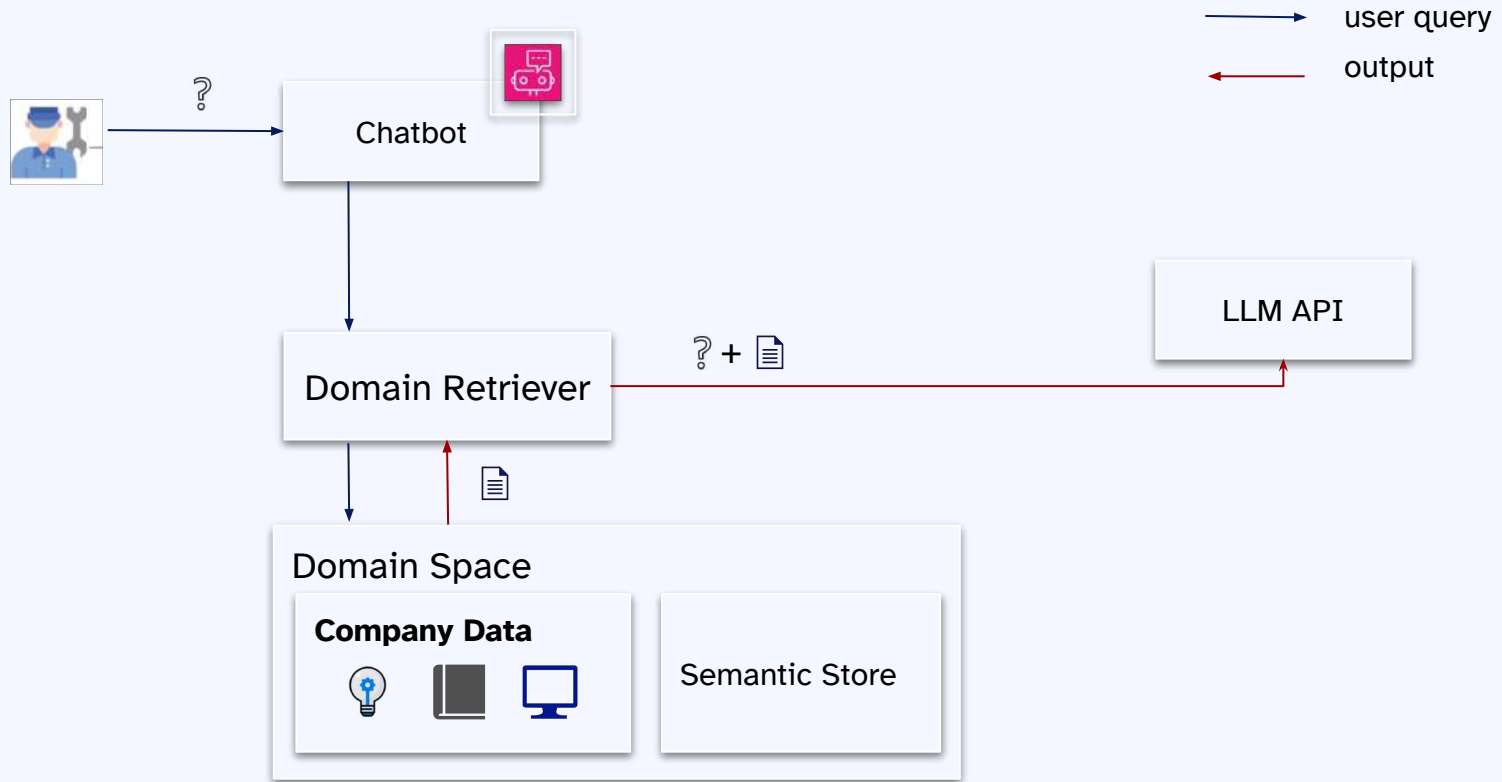


Leveraging domain knowledge

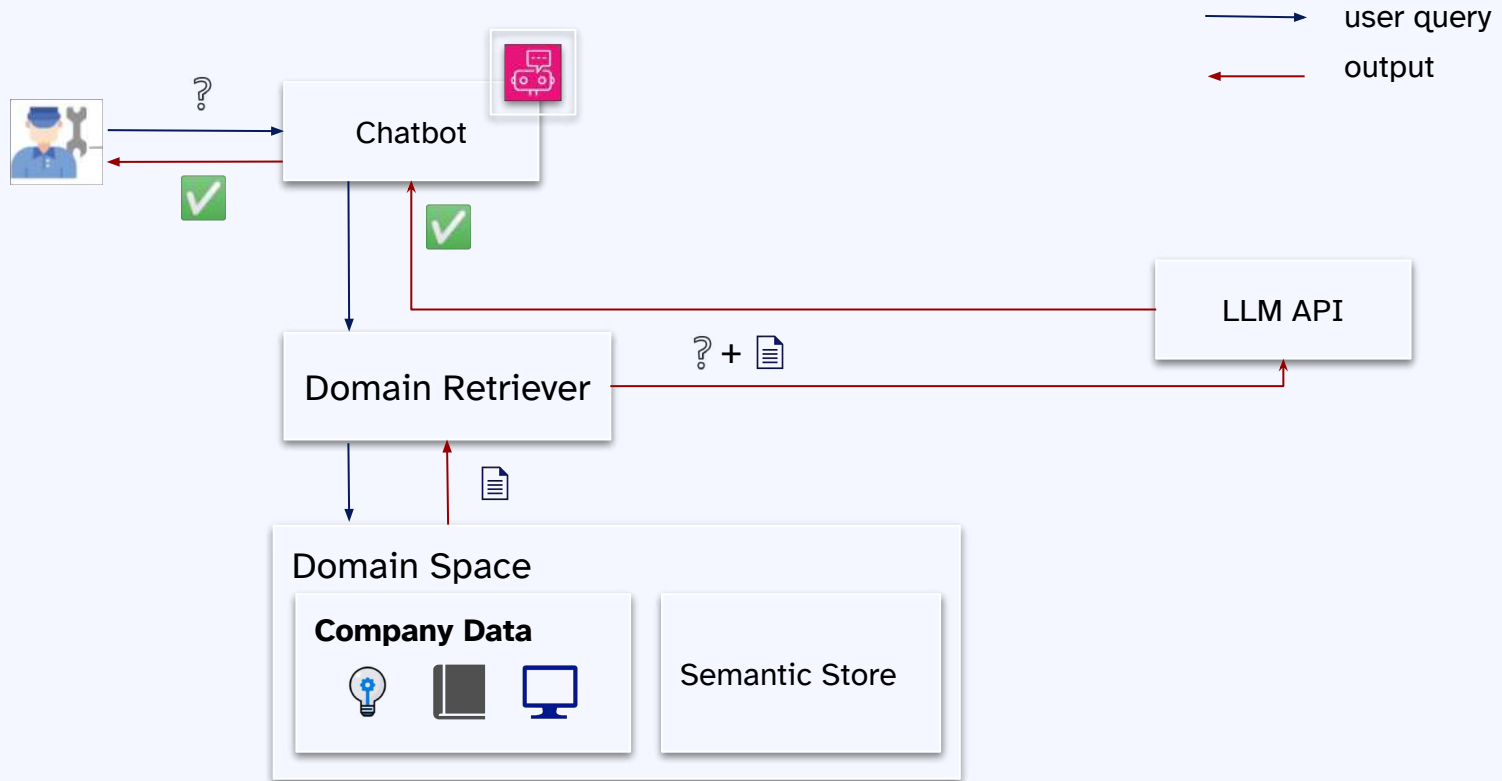


→ user query
← output

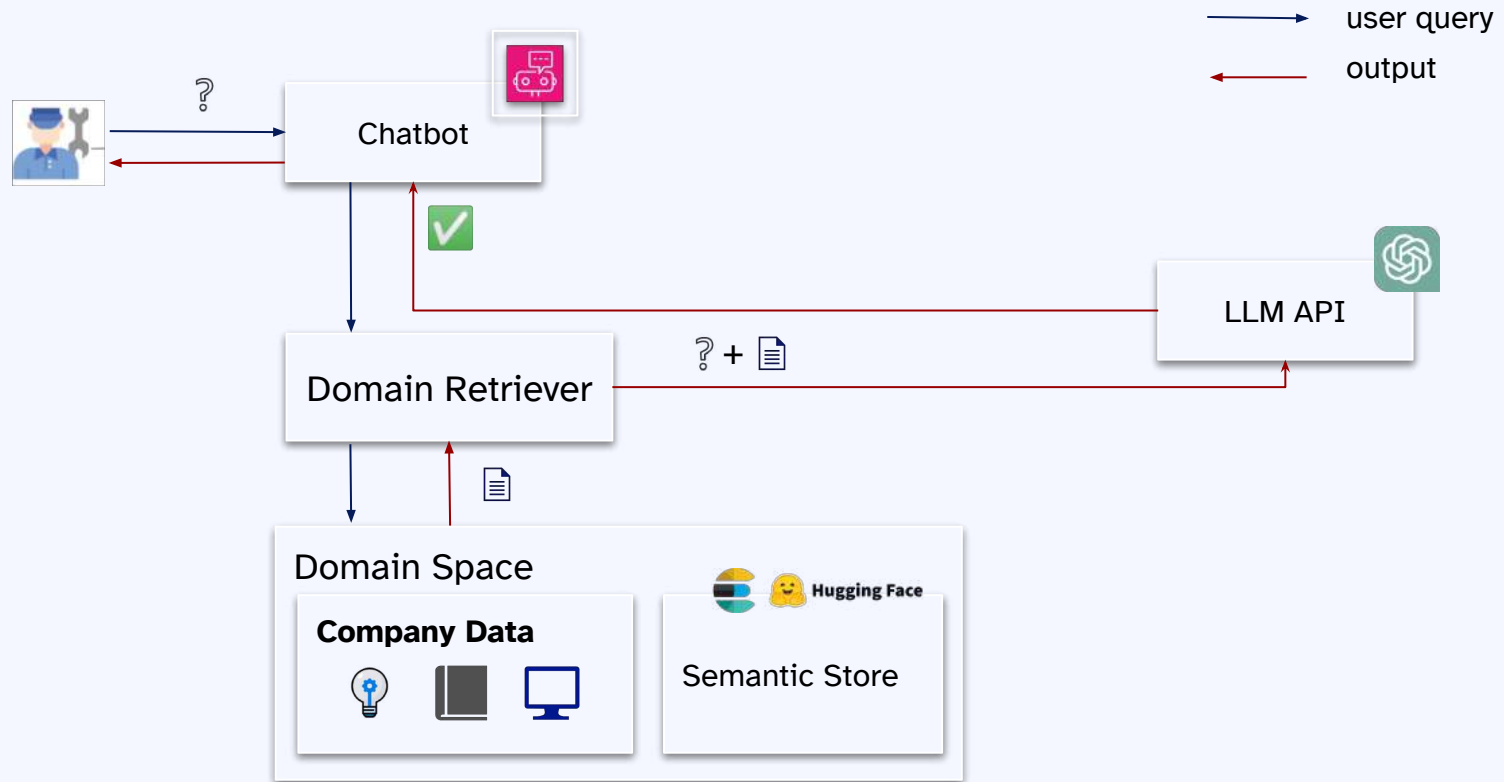
Leveraging domain knowledge



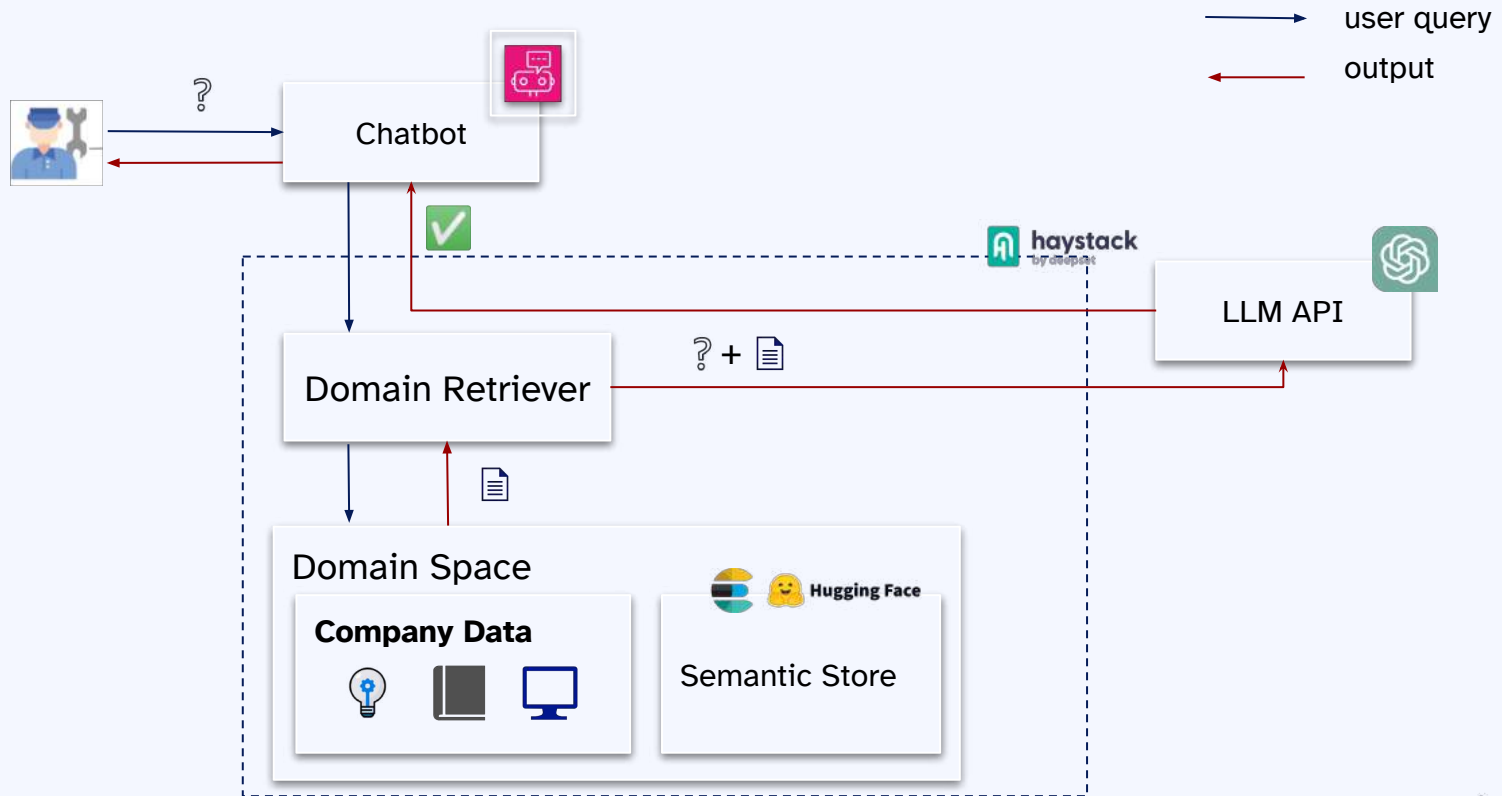
Leveraging domain knowledge



Leveraging domain knowledge



Leveraging domain knowledge



Haystack: A Framework for LLM Applications

All content was based on Haystack version 1.21.2

What is Haystack?



Open-Source **LLM orchestration framework** from [Deepset](#)

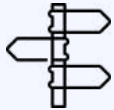
- 11.5k Stars on Github
- uses latest LLMs: OpenAI, Cohere, open-source LLMs
- offers databases like ElasticSearch, vector databases (e.g. Qdrant, Milvus)



Semantic Search, QA, Chatbots



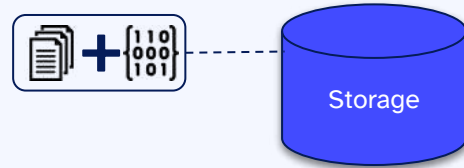
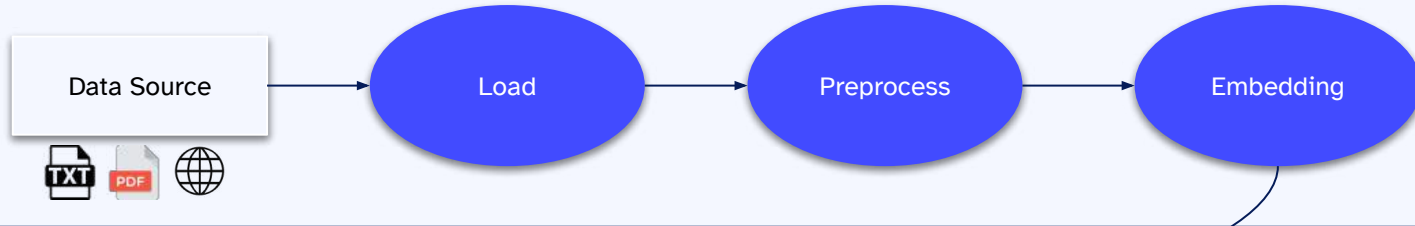
Light-weight: quick proof of concept development



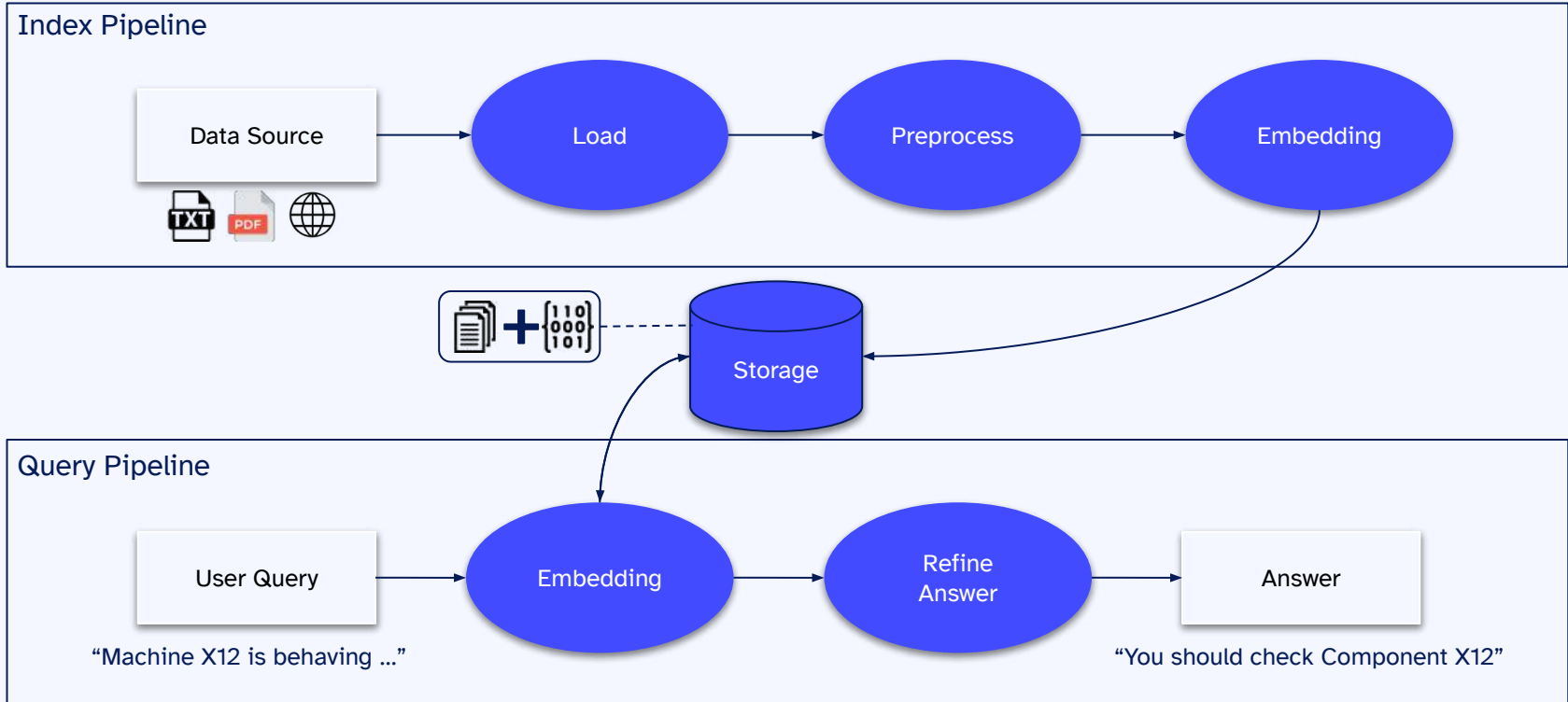
Alternatives: LangChain, LlamaIndex

Make knowledge accessible

Index Pipeline

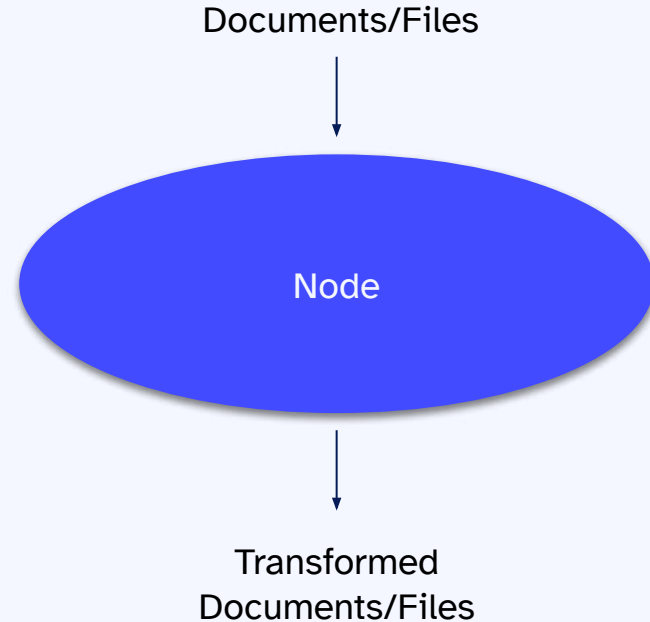


Retrieve Information



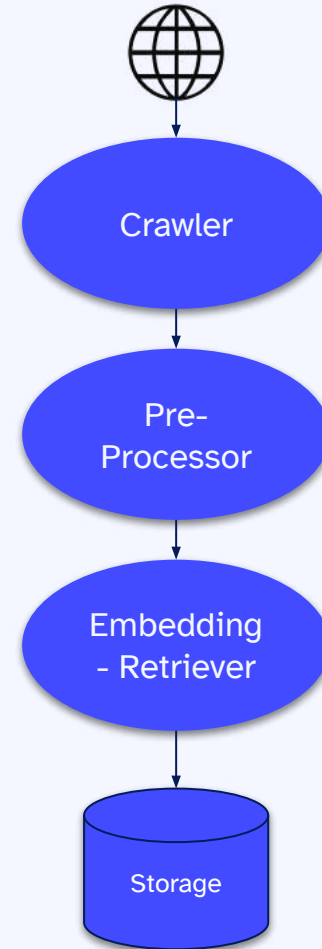
Haystack Nodes: Specialized Tools

- Node implements single functionality
- Node updates received content
- Plug & Play



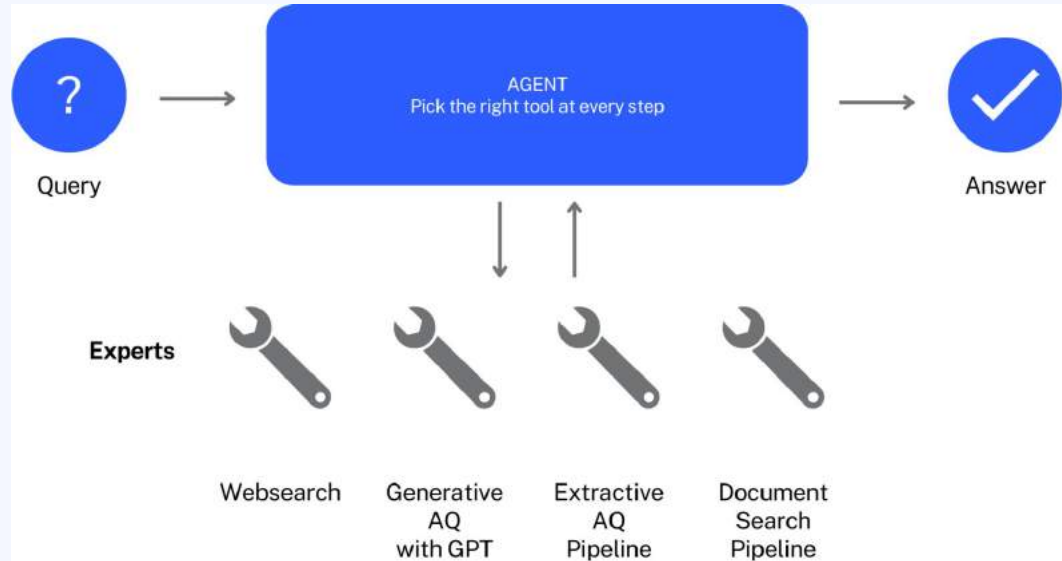
Pipelines : The main instrument

- Each **Node** individual functionality
 - Crawler
 - Preprocessor
 - Embedding-Retriever
 - Prompt-Node
- **Data** passed on between nodes.
- Connected to **Document-Store**



Agents : Intelligent decision makers

- **Decisive**
component for
generating flexible
pipelines
- Agents pick **tools**
to get the best
answer with the
help of LLMs



Demo Time

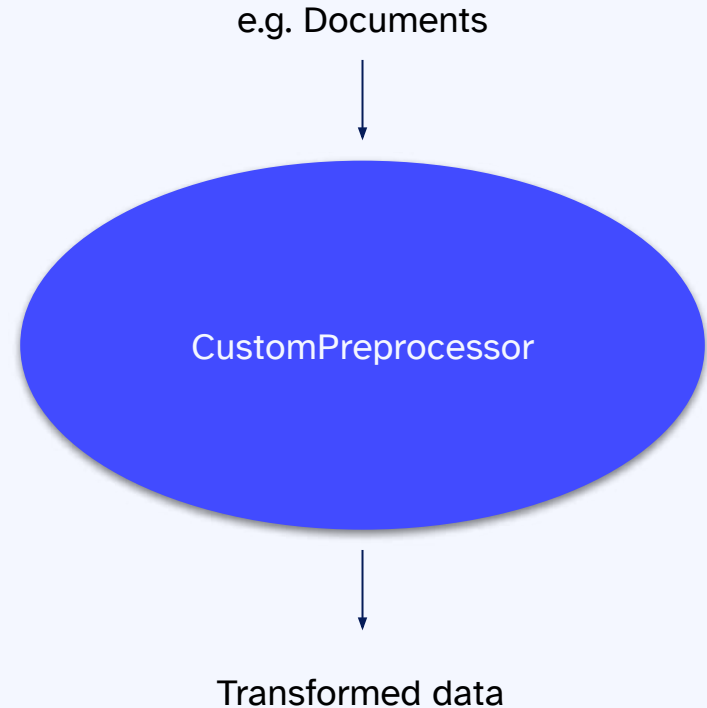
Custom Nodes: Flexibility in Task Processing

Customize tasks such as

- preprocessing, e.g. finding specific information in PDFs
- filtering search results

Setup:

- inherit from `BaseComponent`
- define `run()`, `run_batch()`



Conclusion

To Build LLM Applications..



Start simple, e.g. with LLM frameworks like haystack that are

- offer out-of-the-box integrations
- easily integrate domain knowledge



Know how to use the tools with prompt engineering

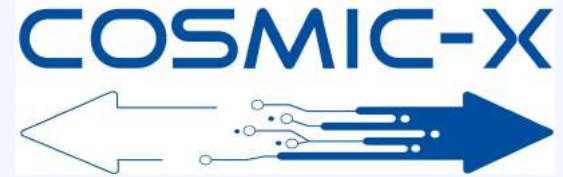
- use well designed prompts and provide guidance
- provide context to expand knowledge



Inform yourself about considerations

- copyright & privacy, data security, bias, ..
- stay up-to-date with regulation

Collaboration Project: cosmic-x



The content of this presentation originates from the research project **“Collaborative Smart Services for Industrial Value Networks in GAIA-X (COSMIC-X)”**.

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Thank you!



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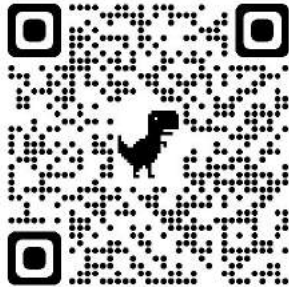
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