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Generative AI for Knowledge Linking: The Future of AVEVA

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Contents

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Generative AI

ChatGPT burst in the headlines in 2023

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Large Language Models

What is an LLM?

"It is a mistake to think you can solve any major problems just with _____"

Embeddings
Model
Text to **Tokens** to **Embeddings**
vectors

| 0.012 | 0.768 | 0.398 | 0.005 | 0.291 |

OOM: 100 Billion neurons

Embeddings to **Tokens** to **Text**
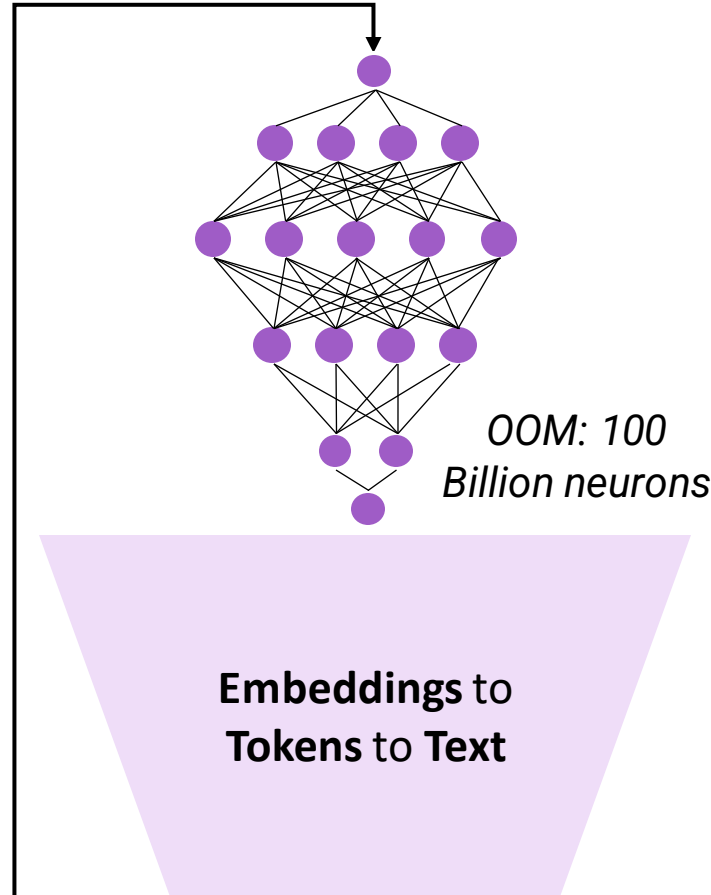
"It is a mistake to think you can solve any major problems just with potatoes"

*G*ENERATIVE – completion model predicting the next word.

*P*RETRAINED – data you send is thrown away.

*T*RANSFORMER – text is converted to embeddings vectors.

- Douglas Adams, Life, the Universe and Everything

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AVEVA Knowledge Linking

… leveraging the power of LLM in the AVEVA Connect platform

- Fast Onboarding - Data inferencing finds relationships without a hierarchy or structured entity relationships

- Objective-driven queries – break down complex queries into multiple sub-tasks to get a consolidated response
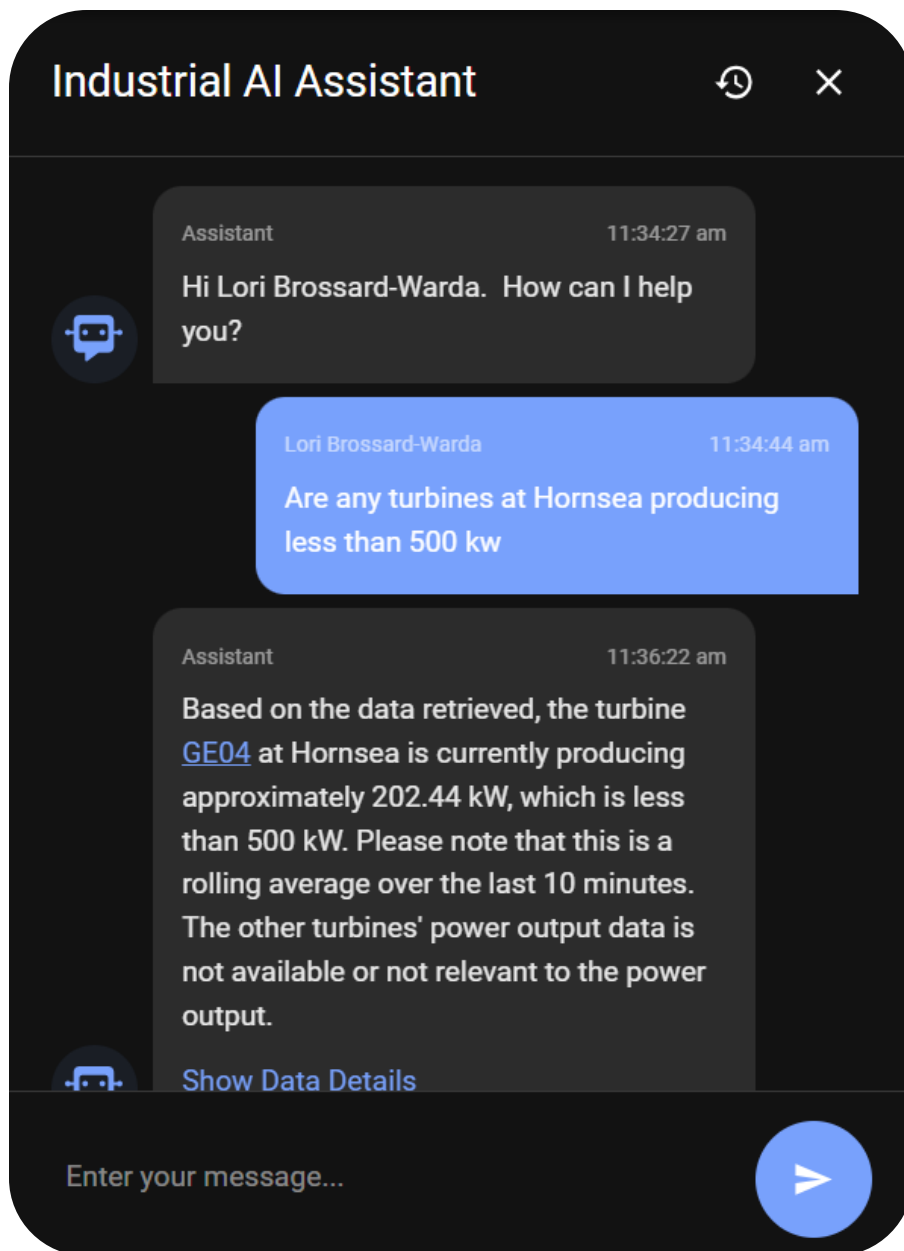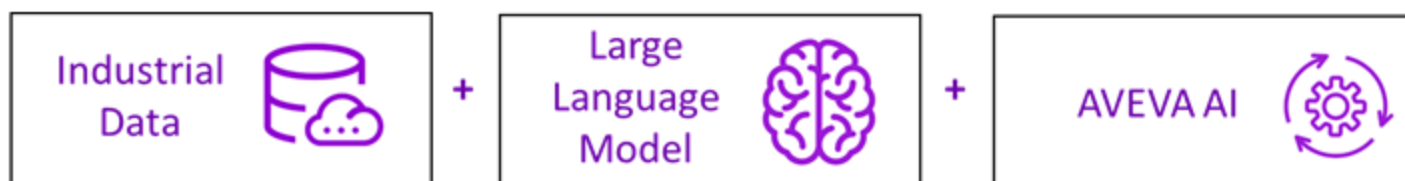
Architecture
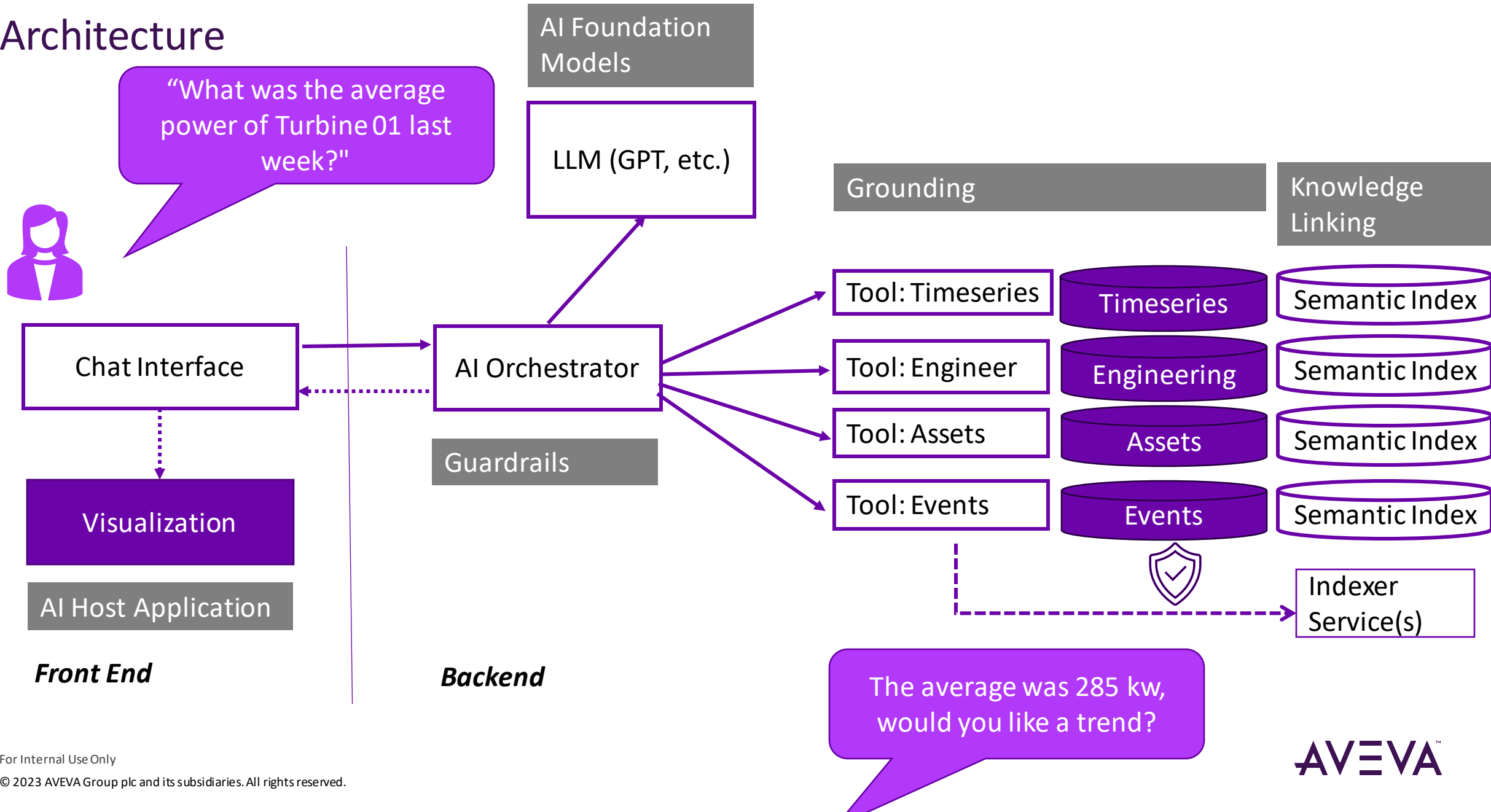
The AI Assistant is working hard to ensure good results

- **Prompt Engineering:** We tell it what it is and how it should behave "You are a friendly, truthful, informative, industrial AI analyst ……If you don't get any data back from the tool just tell the user you don't have the data for their question."
- **Critique**: the orchestrator critiques its own plan

Guardrails

- **Citations:** We show the data used to make the decisions which the system thinks is relevant
- **Real Data:** The LLM is the communication conduit, but the workflow has to use tools and real data. If it can't find the answer using those tools it can't just supplant its own answer.

Grounding

- **User Context:** All data access is using your existing security context
- **Throw away:** LLM is never trained with your data – its stateless. All requests sent to the LLM are 'thrown away'

Security / Property

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Guardrails

- **Prompt Engineering:** We tell it what it is and how it should behave "You are a friendly, truthful, informative, industrial AI analyst ……If you don't get any data back from the tool just tell the user you don't have the data for their question."
- **Critique**: the orchestrator critiques its own plan

Guardrails

Industrial AI Assistant

Assistant   11:12:39 am
Hi David Smith. How can I help you?

Enter your message...

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Grounding

- **Citations:** We show the data used to make the decisions which the system thinks is relevant
- **Real Data:** The LLM is the communication conduit, but the workflow has to use tools and real data. If it can't find the answer using those tools it can't just supplant its own answer.

Grounding

Industrial AI Assistant

Assistant — 11:29:30 am
Hi David Smith. How can I help you?

David Smith — 11:29:51 am
Who will win teh 2023 F1 World Championship?

Assistant — 11:29:53 am
I'm sorry, but as an AI developed by AVEVA, I don't have the ability to predict future events such as the winner of the 2023 F1 World Championship. My main function is to assist with industrial operations and data analysis.
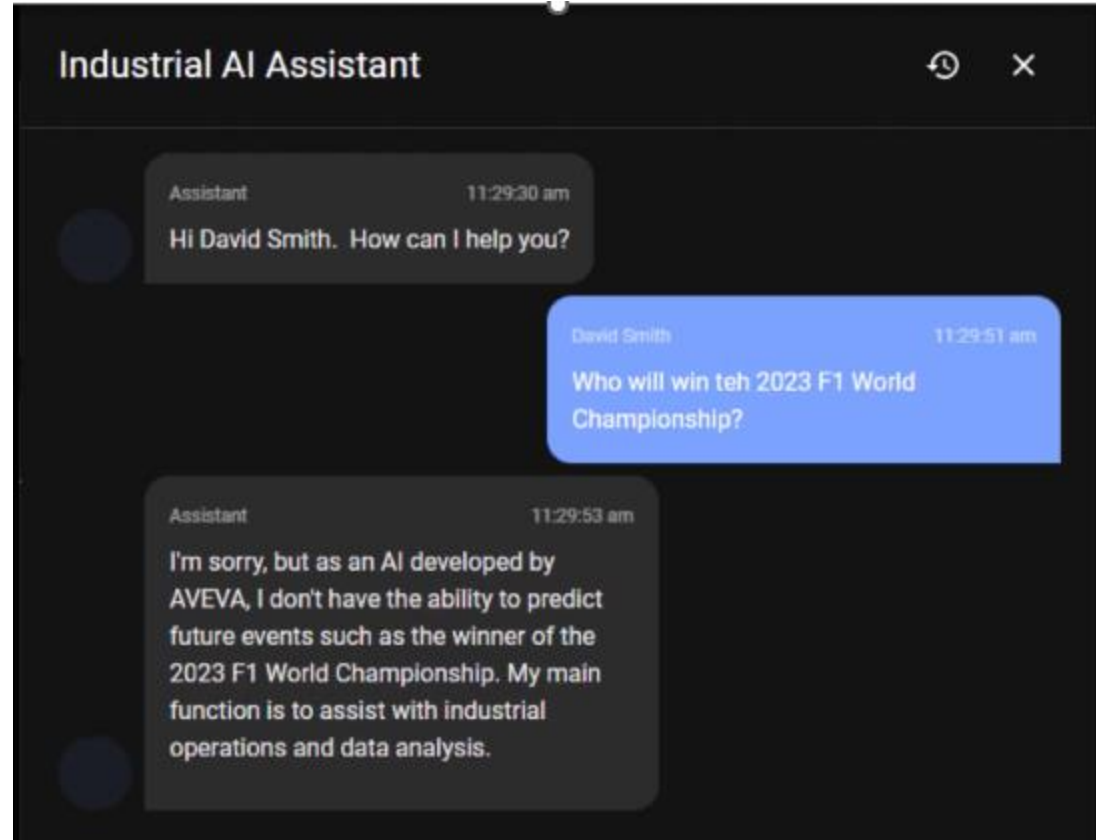
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Security

- **User Context:** All data access is using your existing security context

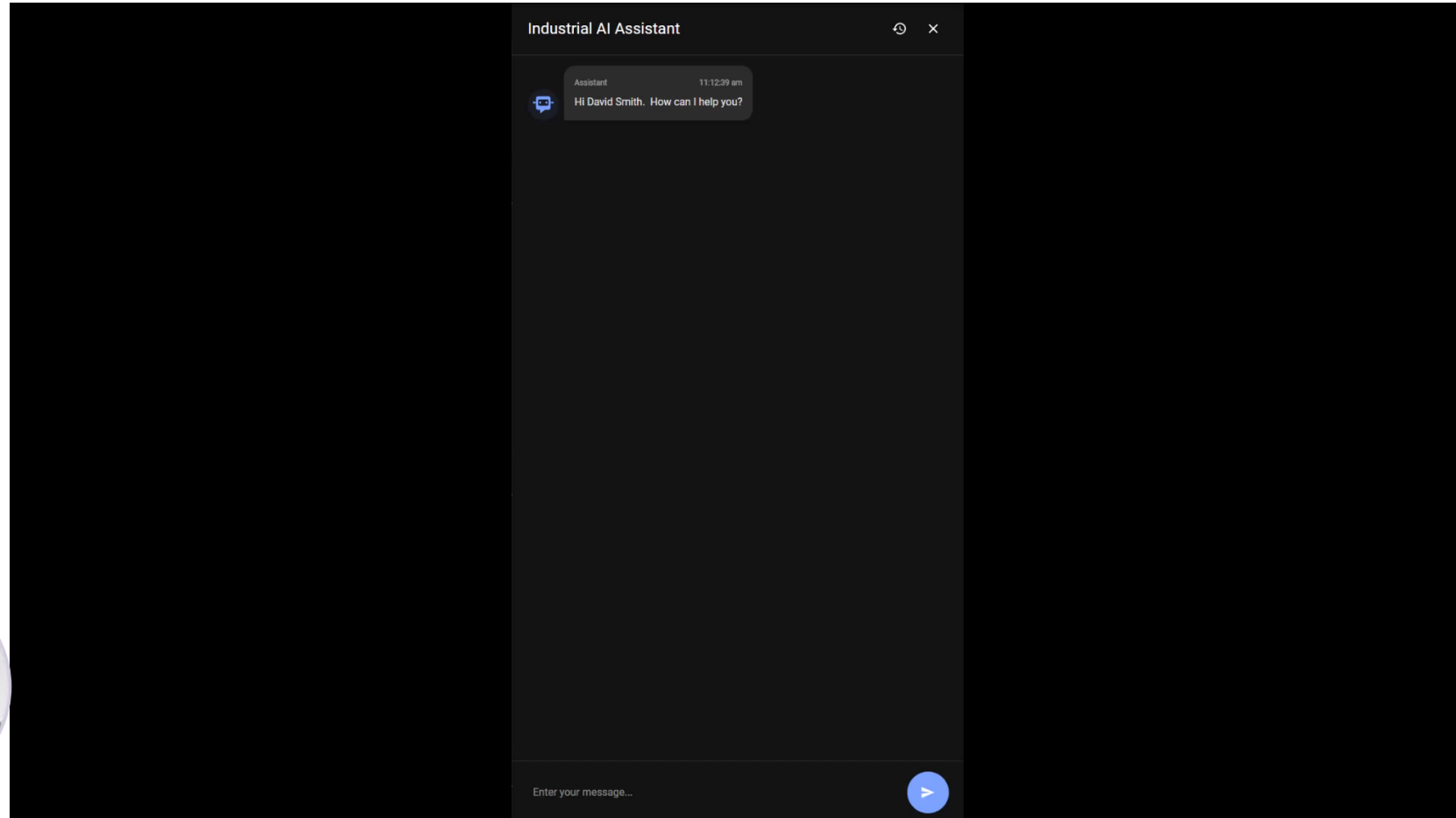- **Throw away:** LLM is never trained with your data – its stateless. All requests sent to the LLM are 'thrown away'

Security / Property
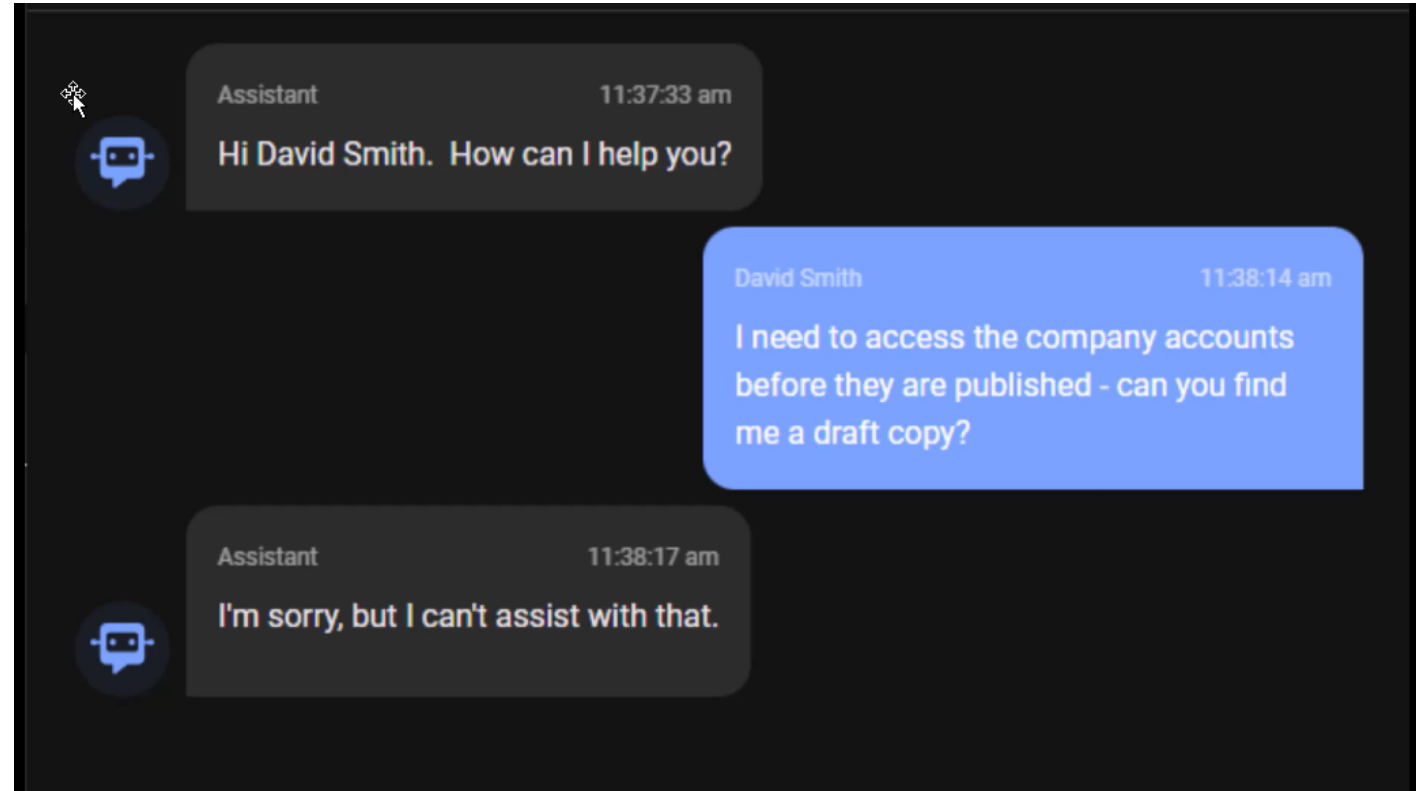
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Demo
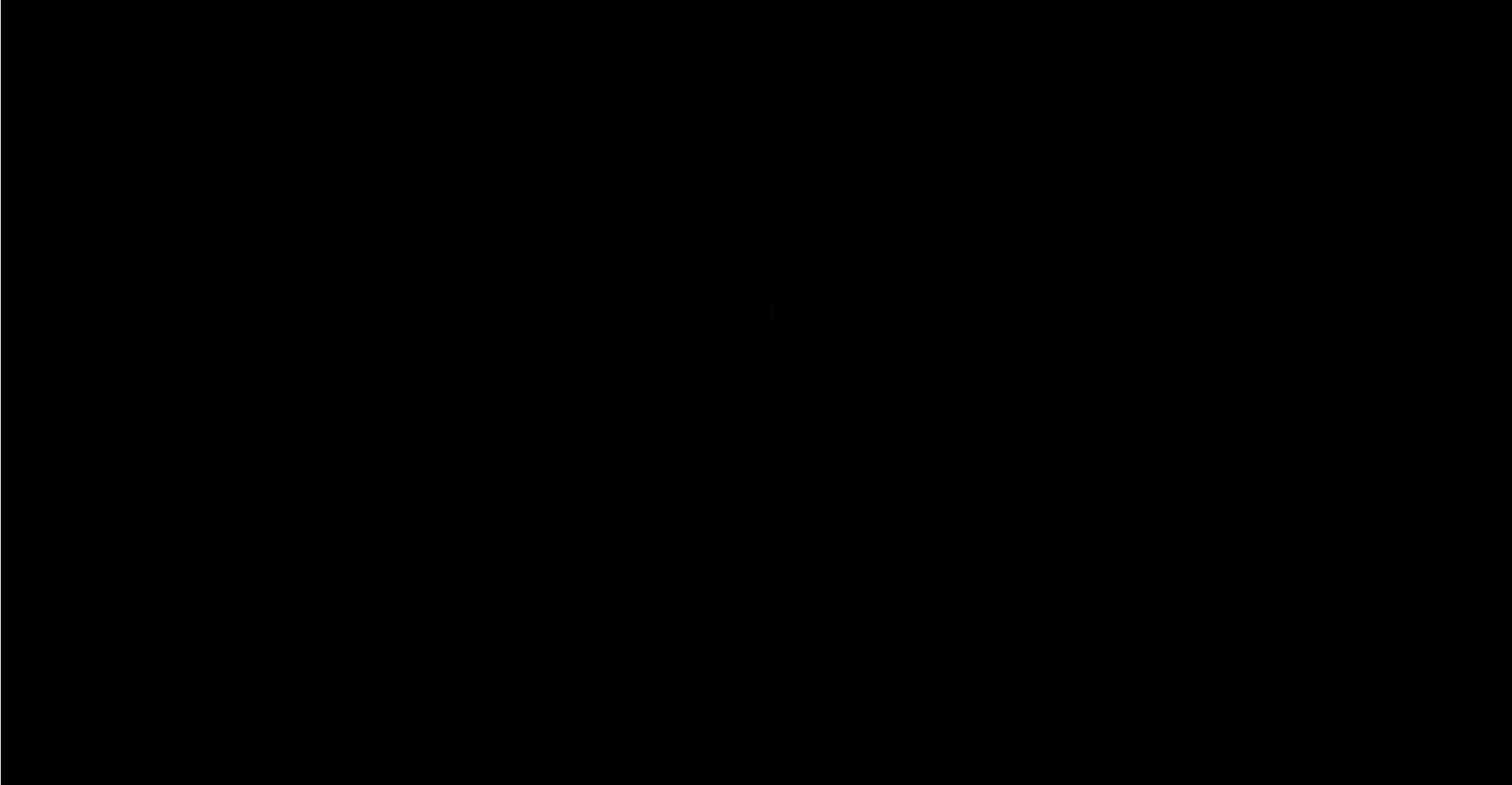
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Takeaways

AVEVA Knowledge Linking and Industrial Assistant will transform your experience

- AVEVA Knowledge Linking accelerates on boarding by building relationships using inferencing, no need to pre-build an extensive Knowledge Graph.

- AVEVA Knowledge Linking extends the LLM by integrating the power of LLM with your industrial data, even when it is siloed so you can quickly find and summarize the information you need.

- AVEVA is using best practices to ensure that your data is protected and to reduce hallucinations.

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Questions?

Please wait for the microphone.

State your name and company.

Please remember to...

Navigate to this session in the mobile app to complete the survey.

Thank you!

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Learn more about AVEVA AI

Industrial AI@ AVEVA World Conference 2023– San Fran

Update for 2023 - Matt

- **Day 2: Industrial AI Track**

  - AVEVA: AVEVA Connect, Industrial Cloud Platform – Vision, roadmap, and starting your operations and engineering digital twin journey [14:00]

  - AVEVA: Power your secure industrial ecosystem of data, applications, and partners with AVEVA Data Hub connected communities [14:40]

  - AVEVA: Accelerate Your Time to Value with Analytics and Applications Fueled by AVEVA Data Hub [15:40]

  - AVEVA: On your marks, get set, Unleash your Operational Data in the Cloud! [16:20]

  - AVEVA: Aggregating Engineering Content, Data and Documents and Real-Time Data into a Common User Experience [17:00]

- **D**

  -

  - minutes with AVEVA Edge Management [11:25]

  - AVEVA: Visualizing the Digital Twin, an Independent Service on the Industrial Cloud Platform [13:30]

  - AVEVA: Uniting the connected community through secure and transparent industrial data sharing [14:25] [this talk]

  - AVEVA: Harnessing the power of Sequential Data Store (Sds) and Assets for developers and partners [15:30]

  - AVEVA: Aggregating data with Data Hub asset rules and data views for analytics and applications [16:25]

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The Company shall not be obliged to disclose any revision to these forward-looking statements to reflect events or circumstances occurring after the date on which they are made or to reflect the occurrence of future events.
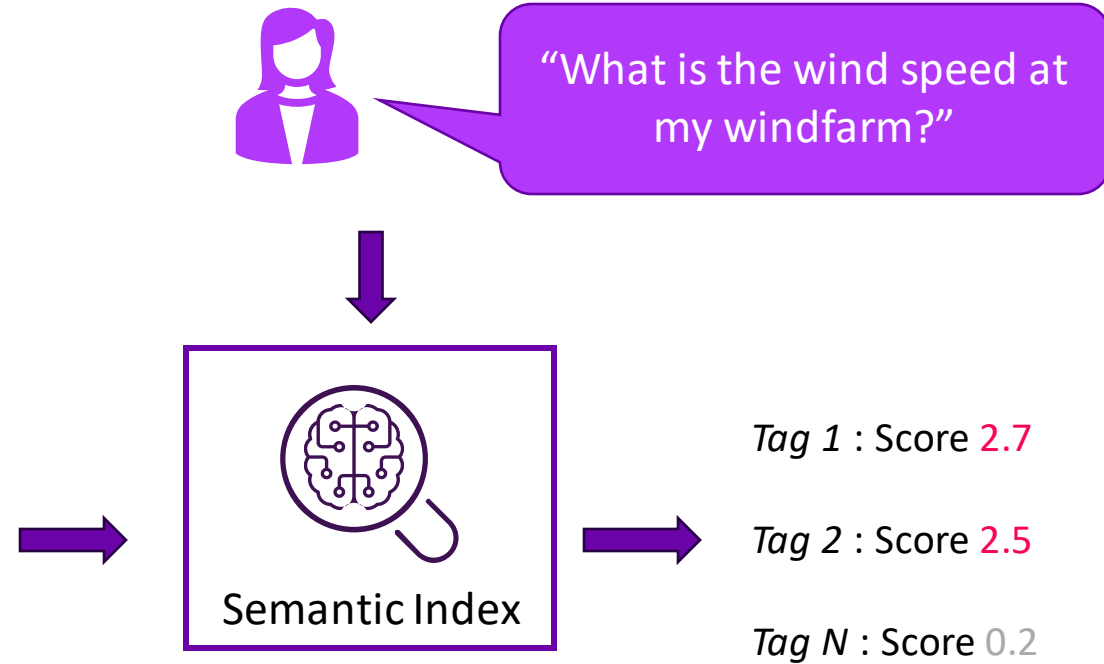
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Enabling Technologies : Hybrid Semantic Search

Tag ID: 01HAD102WindSp10
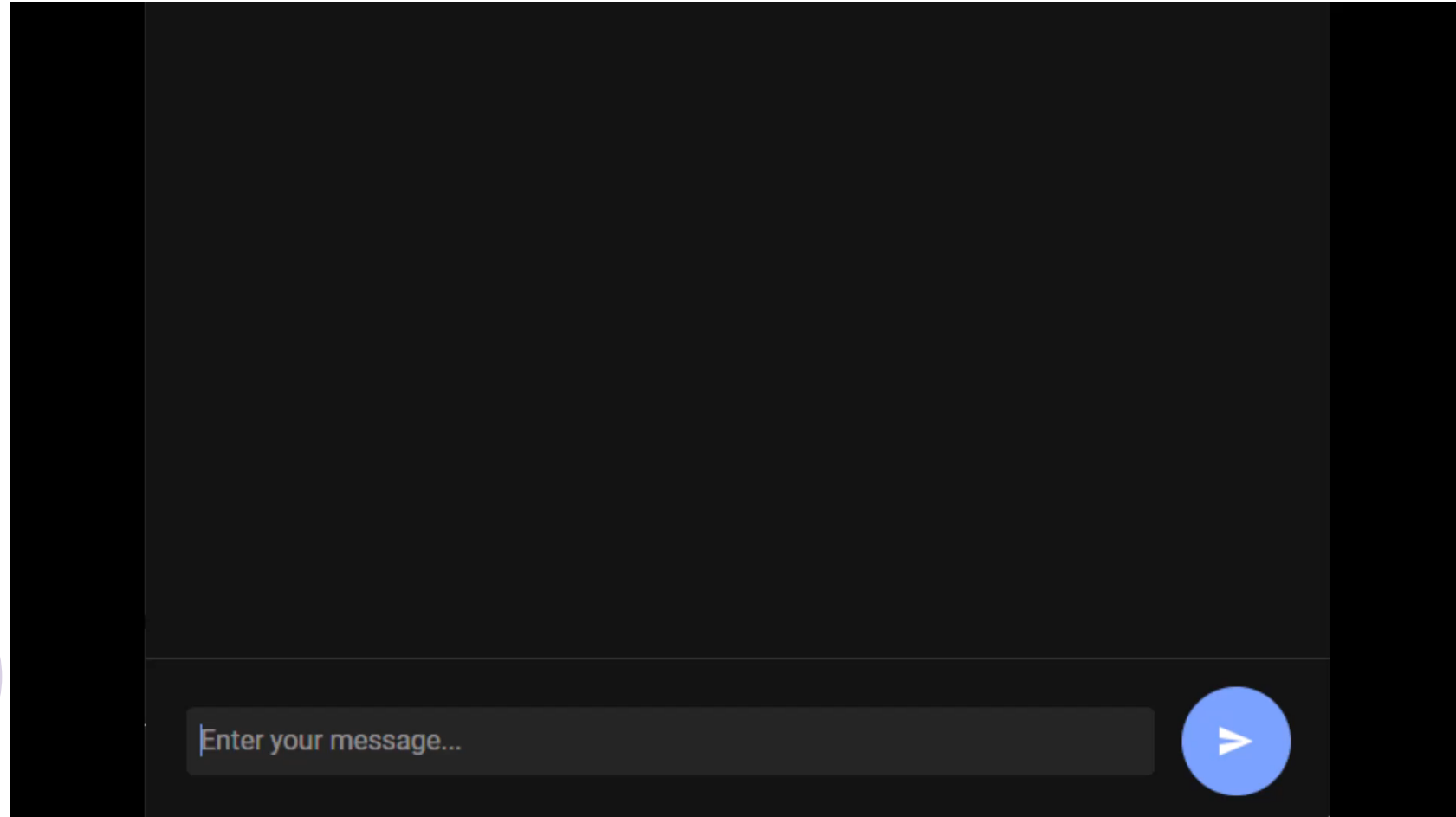
Tag Description: Hornsea Wind Farm Wind Speed

Information: This is a wind speed measurement measured using an anemometer mounted in the nacelle of the wind turbine. It is the average measurement of all the wind speeds measured across GE01 - 21

"What is the wind speed at my windfarm?"

Semantic Index

Tag 1 : Score 2.7

Tag 2 : Score 2.5

Tag N : Score 0.2

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Throw Away

- **User Context:** All data access is using your existing security context (impersonation)
- **Throw away:** LLM is never trained with your data – its stateless. All requests sent to the LLM are 'thrown away'

Security / Property

Enter your message...

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Enabling Technologies : Hybrid Semantic Search