

Lean, Smart, Unstoppable

Die Rolle der KI in der modernen Instandhaltung

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Digital Twin

Maintenance
Process

Spareparts

Instandhaltung

Connected

Security

KPI

Predictive
Maintenance



Moderne Instandhaltung ist die Symbiose aus Mensch, Maschine und KI – sie macht die Anlagen und Fabriken nicht nur effizienter, sondern lernfähig.

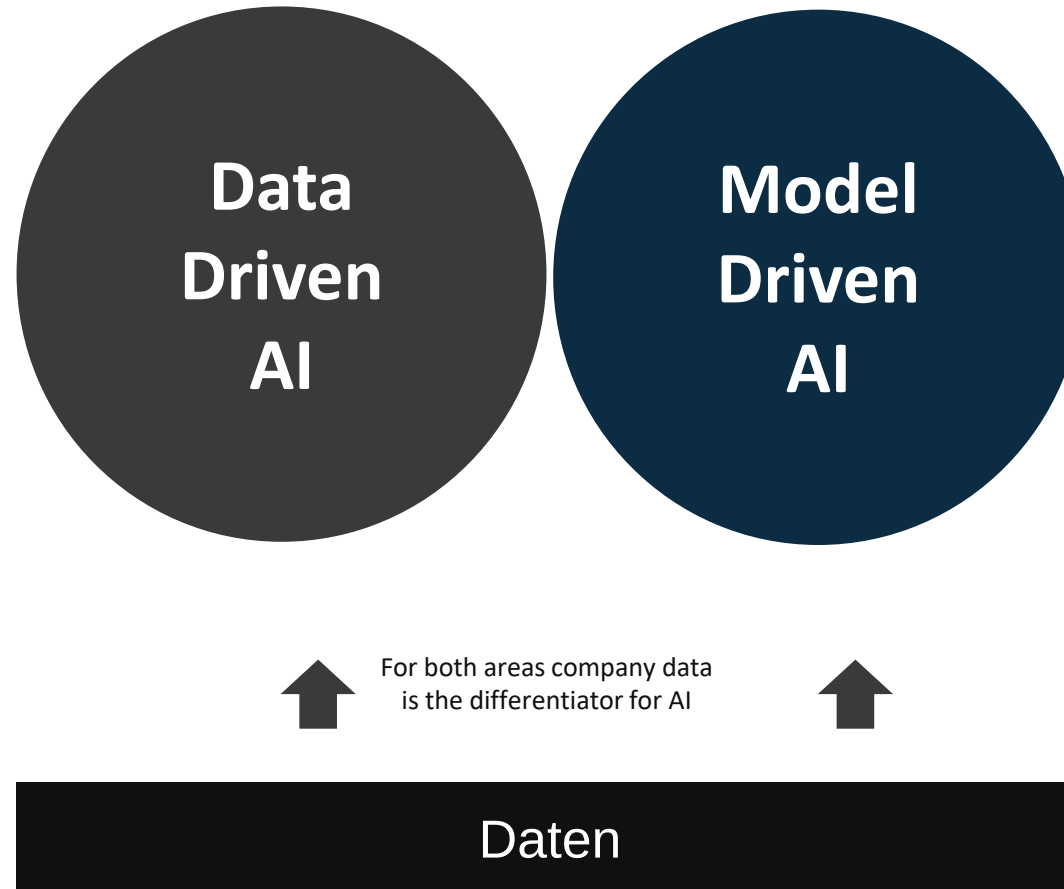
Einfache Kategorisierung von angewandter KI

Datengetriebene KI

Nutzt Statistik, Algorithmen und Datenwissenschaft, um **Erkenntnisse aus strukturierten und unstrukturierten Daten** zu gewinnen und Geschäftsprobleme zu lösen.

Use Cases:

- Data Analytics
- Data Visualization
- Data Mining
- Data Exploration
- Machine Learning



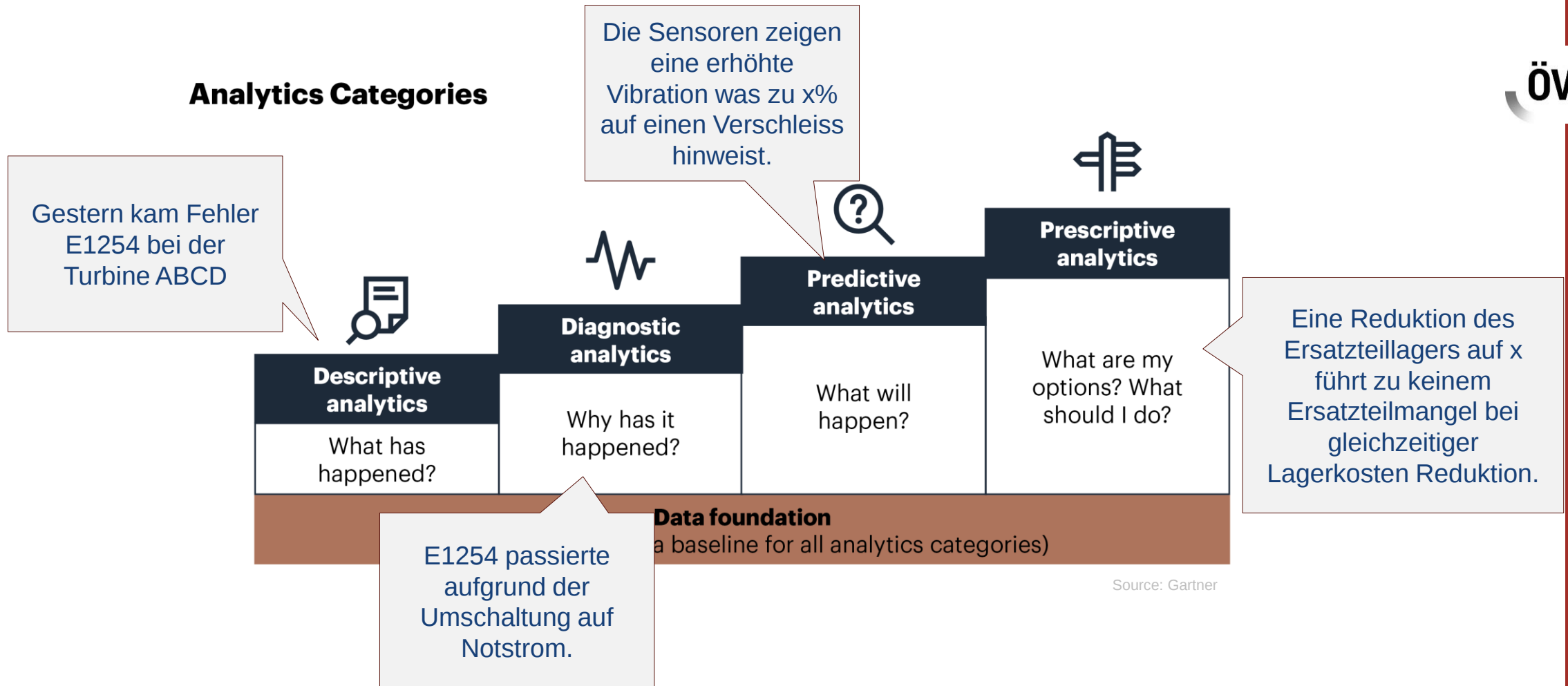
Modellgetriebene KI

Basiert auf **vortrainierten Modellen**, die mit domänenspezifischen Daten **angepasst oder erweitert** werden, um gezielte Aufgaben automatisch oder interaktiv auszuführen.

Use Cases:

- Automation
- Augmentation
- Acceleration
- Natural Language Interaction

KI/Analytics und Daten





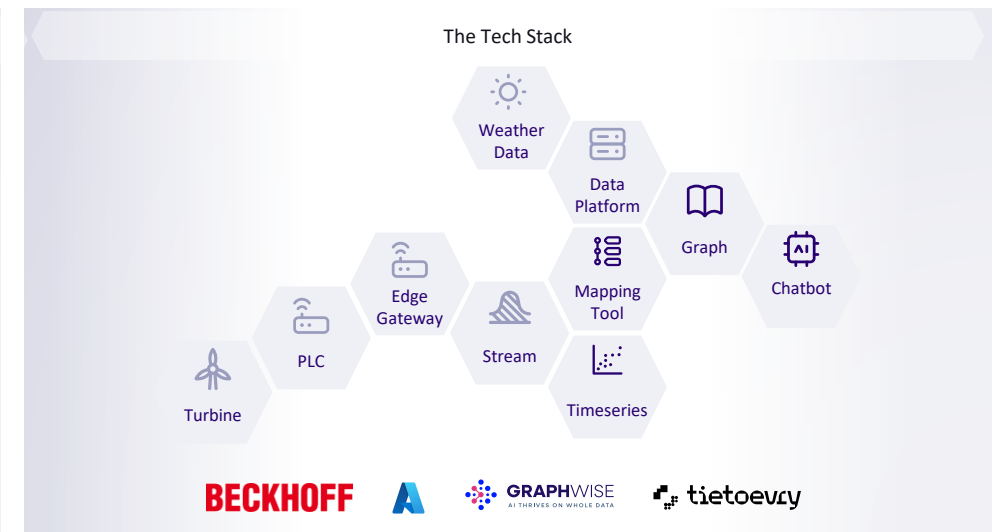
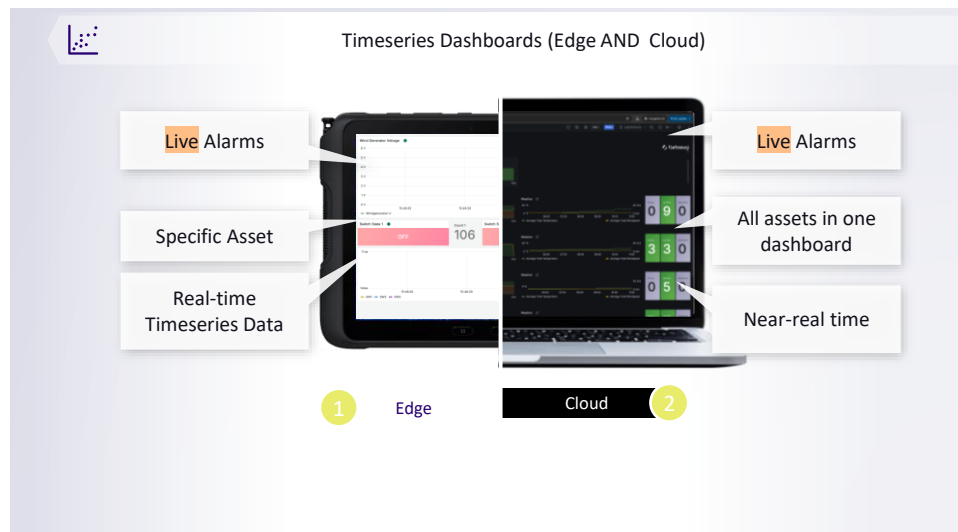
Ein Echtbeispiel – Windpark Demonstrator (1/3)

Physische Komponenten



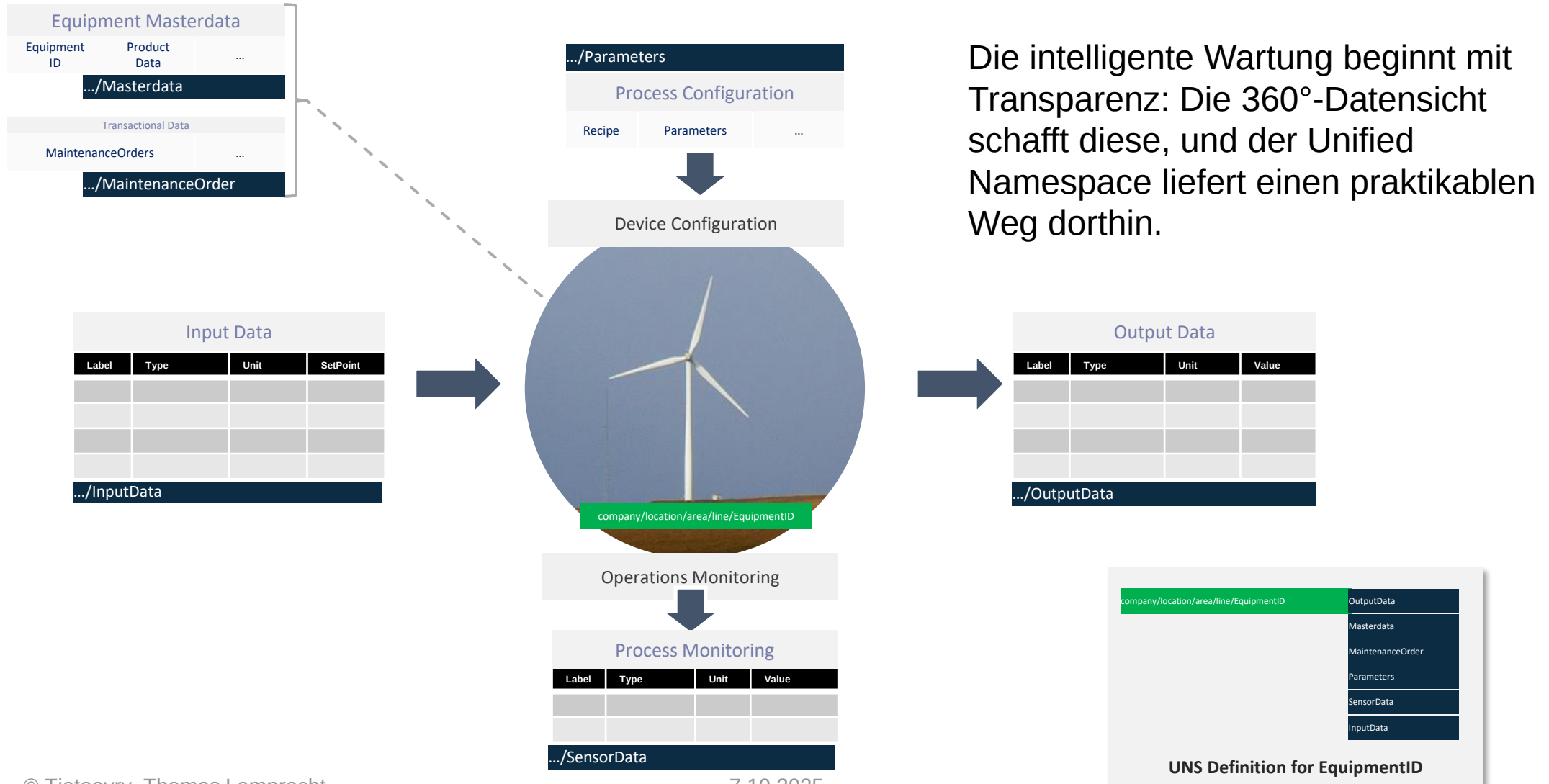
Ein Echtbeispiel – Windpark Demonstrator (2/3)

Digitale Komponenten



Ein Echtbeispiel – Windpark Demonstrator (3/3)

360° Datensicht



Descriptive Analytics

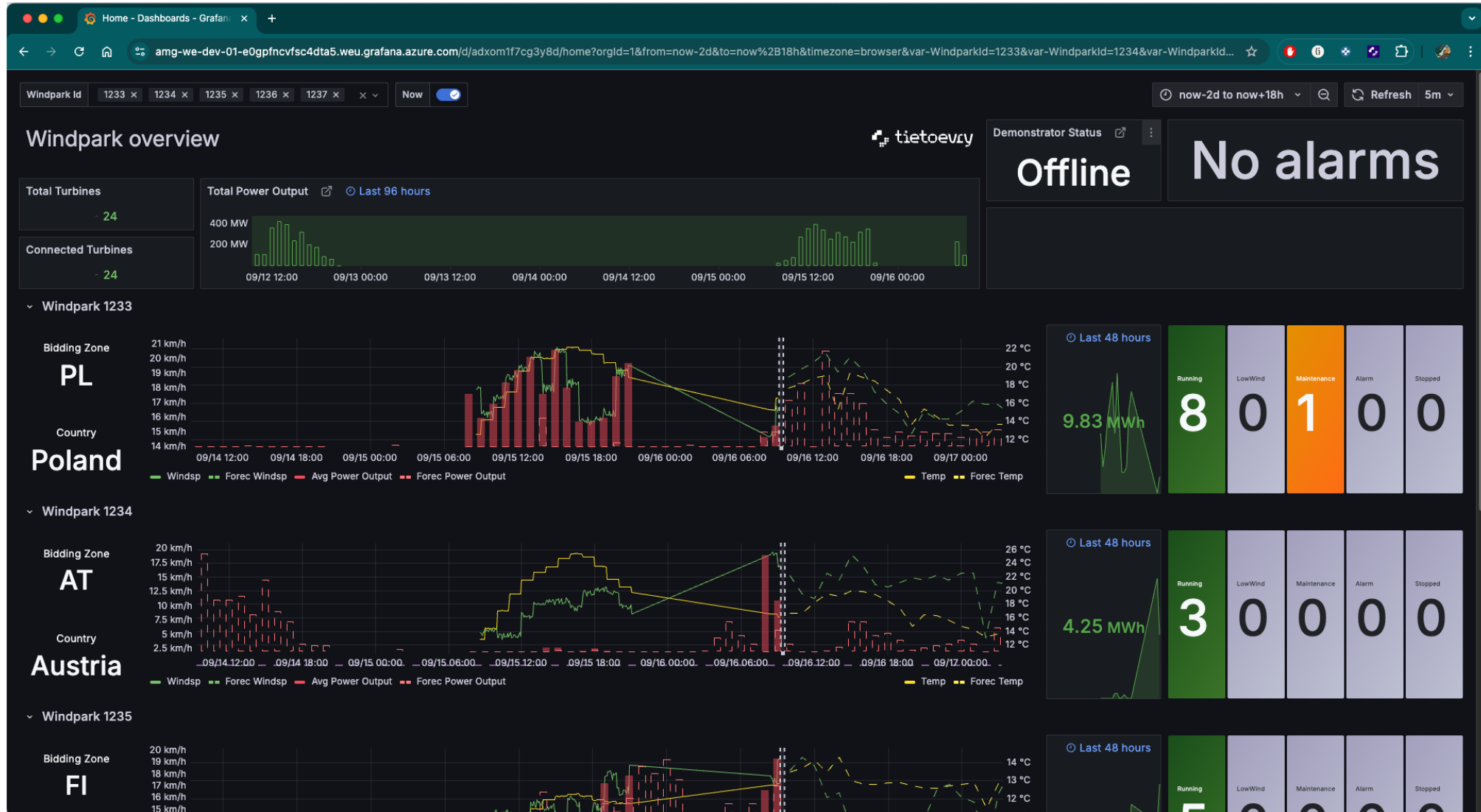
The screenshot displays the Tietoevry Connect web application interface. The top navigation bar includes the Tietoevry logo and the text 'Tietoevry Connect'. The main content area is divided into three sections:

- Hierarchy Browser:** A tree view on the left showing a hierarchy of assets. The 'Demo Company' is expanded, showing 'Paper Mill' and several 'Windpark' entries. The 'Windpark Oulu' entry is selected, showing a list of 'Windturbine' assets. A red box highlights the 'Windturbine 01' entry, with a red label 'Install Base Unified Namespace' below it.
- Windturbine 01 Detail View:** A panel on the right showing details for 'Windturbine 01'. It includes 'General information' (Description: Windturbine 01, Type: Wind Turbine, Parent: Windpark Oulu) and 'Additional Metadata' (Externalid: 1235-01, Windparkid: 1235, Maintenance Interval (hrs): 150, Last Maintenance Date: 2025-03-10 00:00, Maintenance Cost (k€): 40, Nominal Power (W): 7000000, Longitude: 24.9622284, Latitude: 65.7201893). A 'Monitoring Dash...' button is visible. A red label 'Metadata of each' is at the bottom right.
- Channels Table:** A table at the bottom right showing live data for various channels. A red label 'Live Data IoT signals' is at the top right of the table.

The bottom left section shows a map of Sweden with a red pin indicating the location of the windpark.

Electricity	Weather	Turbine
Power P1		1722640.3 W
Power P2		1722637.9 W
Power P3		1722631.5 W
Total Power active		5167909.7 W
Voltage P1		228.14 V
Voltage P2		228.9 V
Voltage P3		227.39 V

Predictive Analytics





Modellgetriebene KI in der Instandhaltung ...



... erlaubt uns neue Formen der Interaktion mit unseren Anlagen, Fabriken und Daten.

Ein Echtbeispiel – Windpark Demonstrator (3+/3)

Query data in natural language with support of a chatbot



Insights on status, performance, documentation ...

ISA95 based company structure and OT mapping

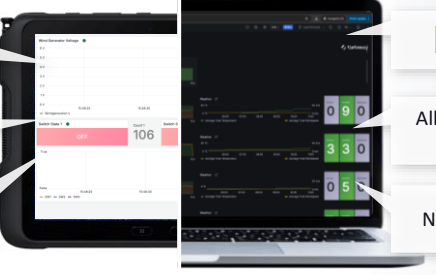


Connect any OT/IoT device

Manage Equipment masterdata

Live Sensor Data with label mapping and units

Timeseries Dashboards (Edge AND Cloud)



Live Alarms

Specific Asset

Real-time Timeseries Data

1 Edge

Cloud

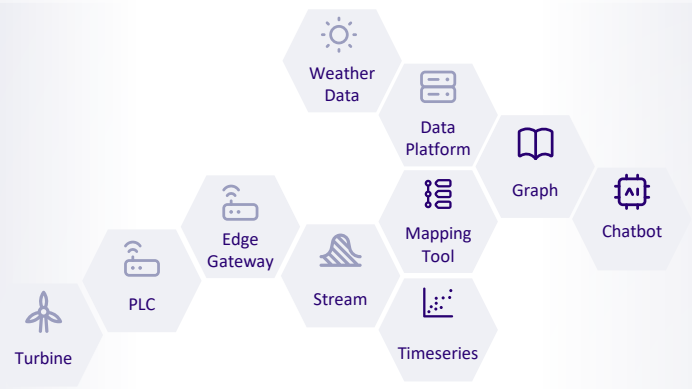
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Live Alarms

All assets in one dashboard

Near-real time

The Tech Stack



Turbine

PLC

Edge Gateway

Stream

Mapping Tool

Graph

Chatbot

Weather Data

Data Platform

Timeseries

BECKHOFF

A

GRAPHWISE
AI THRIVES ON WHOLE DATA

tietoevry

Interaktion Mensch – Windpark

Analyse Masterdata

7

Interaktion Mensch – Windpark (Analytics)

Understand Maintenance need

Standardisierte und offene Interaktion mit Anlagen

The screenshot shows the Tietoevry Chat Beta interface. On the left is a sidebar with a 'New Chat' button and a list of chat history items categorized by 'Today', 'Yesterday', and 'Previous 7 days'. The main chat area features a 'Windparks' assistant icon and the text 'Assistant that provide information about windparks.'. Below this are settings for 'AI Model' (GPT 4o mini) and 'Conversation Style' (Balanced). A 'Cognito Mode' toggle is also present. At the bottom, there is a chat input area with a 'Prompts' button and a 'Give me the maintenance' button. A red box highlights the 'Prompts' button and a dropdown menu with options: 'Windpark', 'Windturbine', 'Masterdata Mapping', and 'Knowledge Graph'.

1. List all locations of the Windparks?

List all locations of the Windparks?

Here are the locations of the Windparks:

Windpark Name	Latitude	Longitude
Windpark Vienna	48.2403645	16.3822011
Windpark Kalmar	56.6691712	16.3474703
Windpark Bergen	60.3507608	5.2879372
Windpark Oulu	65.7201893	24.9622284
Windpark Wrasław	51.1133124	17.0473952

If you need additional information about these windparks or have any other questions, feel free to ask!

2. Weather forecast for <location> today?
 3. Highest windspeed in one of the turbines in Kalmar of the last 6 hrs?
 4. Energy Production in kWh for <location> over the last day?
 5. Give me the upcoming maintenance date upon the defined intervall for turbine <id> in <location>?
 6. Give me the turbine with the next upcoming maintenance date of <location>?
 7. Can you create a digital twin for the Turbine 01 in Bergen?
 8. Can you digital twins for all Windturbines in <location>?
-

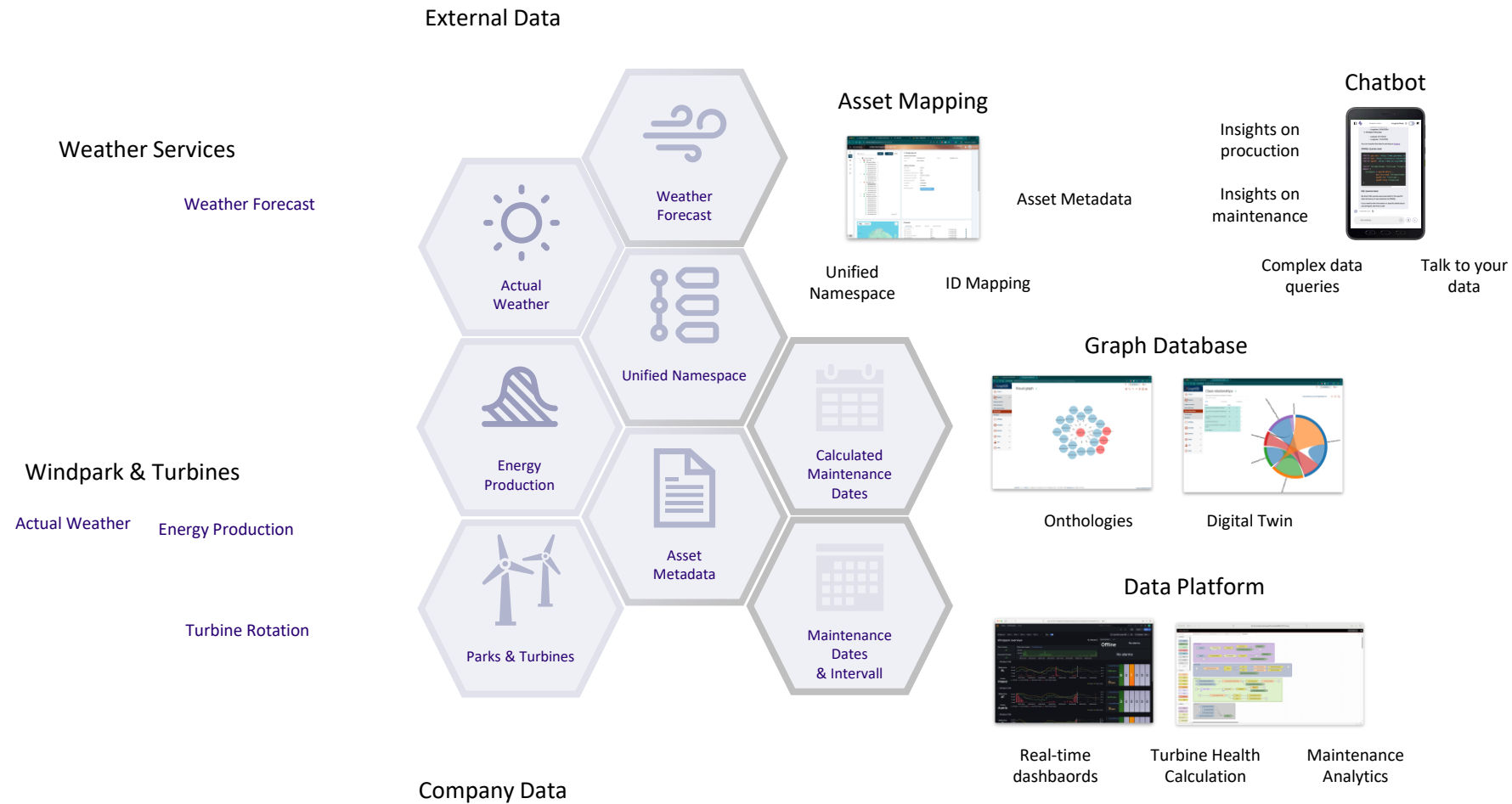
... noch eine Sache

... der nächste Level



Wir werden mit natürlicher Sprache mit unseren Anlagen interagieren.

Innovative Maintenance in a nutshell



Lean

... gezielter Einsatz von KI und Daten sind die Basis für maximale Effizienz

Smart

...neue Interaktionsmöglichkeiten mit Anlagen heben diese auf das nächste Level.

Unstoppable

...es ist nicht die Frage ob, sondern wann?



Vielen Dank!