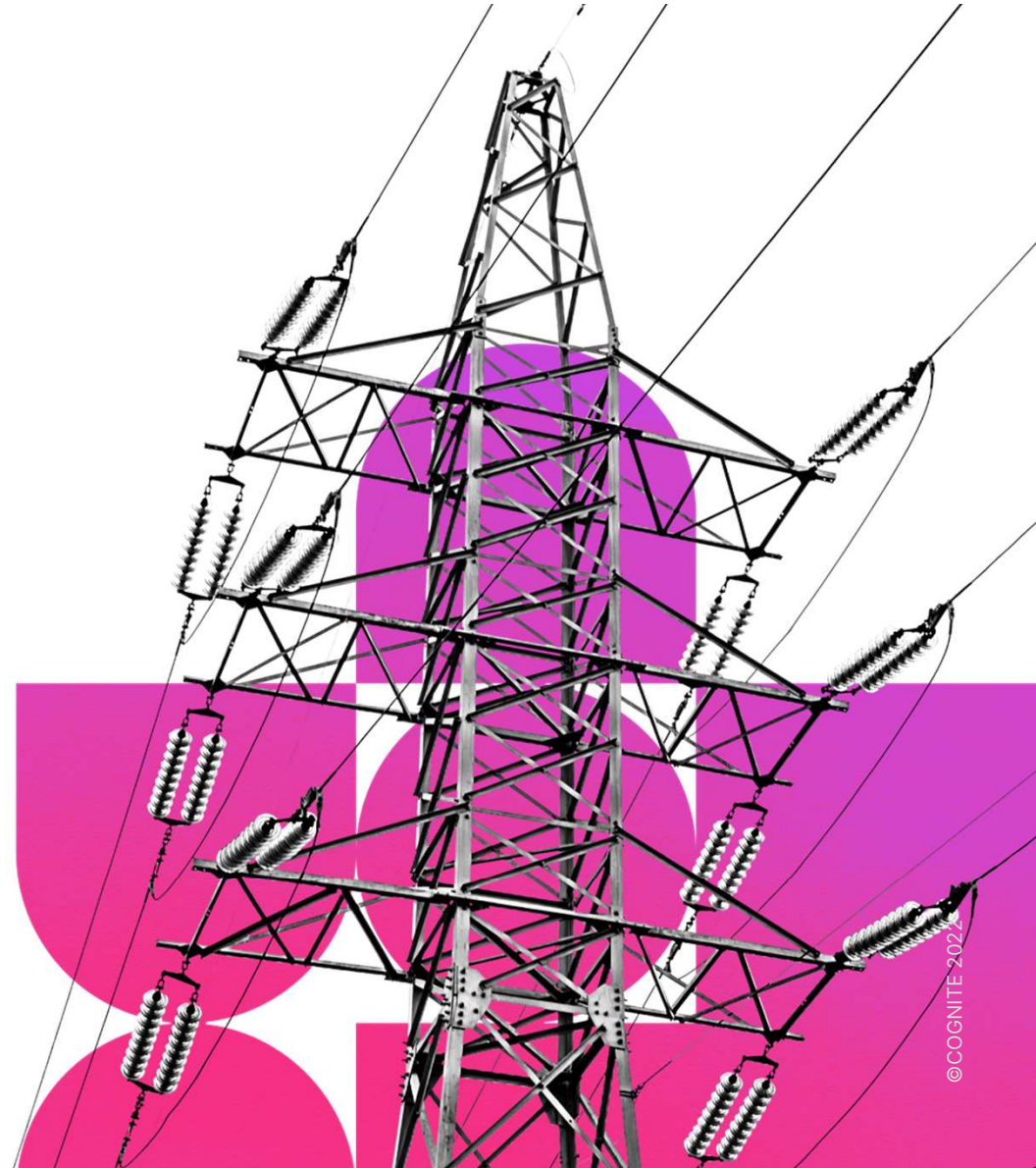




Unpacking the Data Ecosystem for Launching, Maintaining, and Scaling Owned Digital Twin Solutions

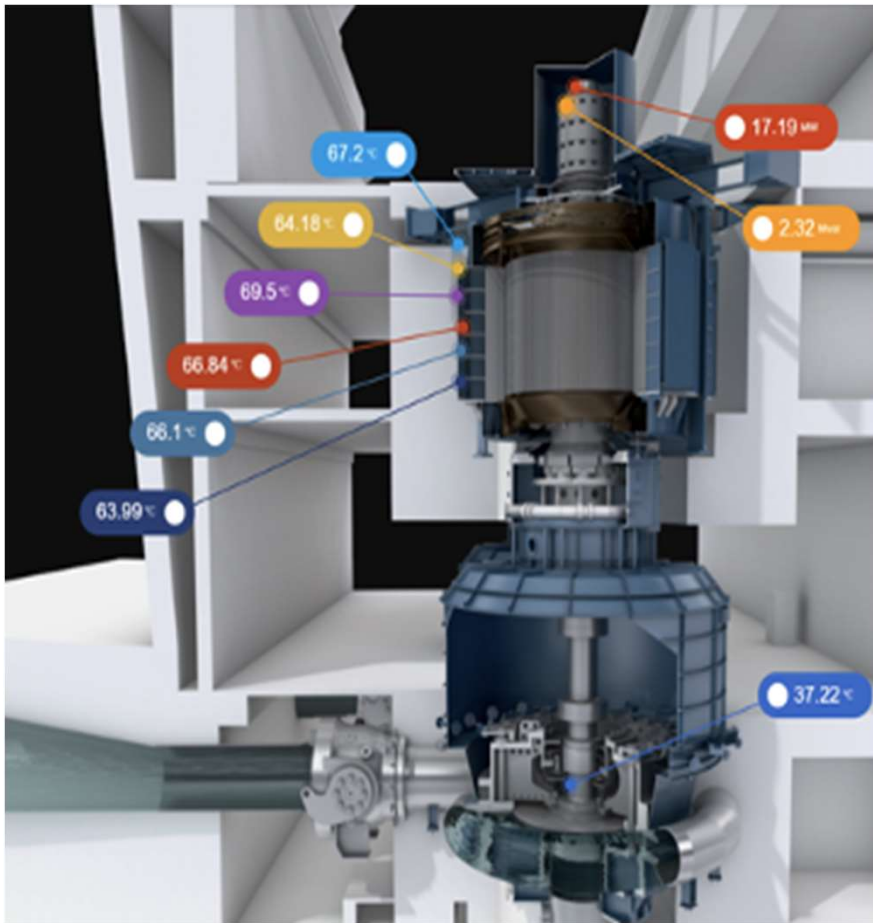
Gabe Prado - Cognite
Sr. Director, Product Marketing

Georg Baecker - Tetra Tech
Sr. Director, Utility Management Consulting

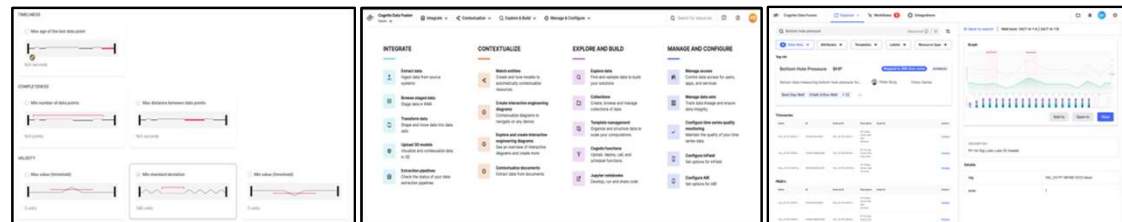
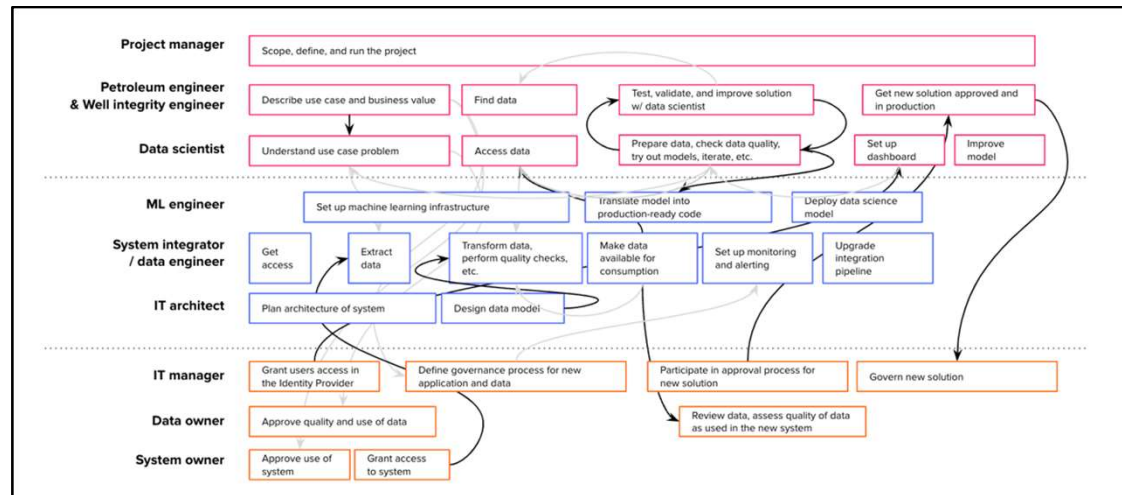
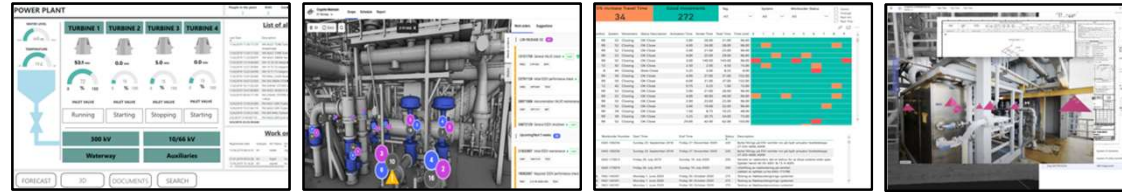


Industrial Digital Twins in 2022:

Expectation



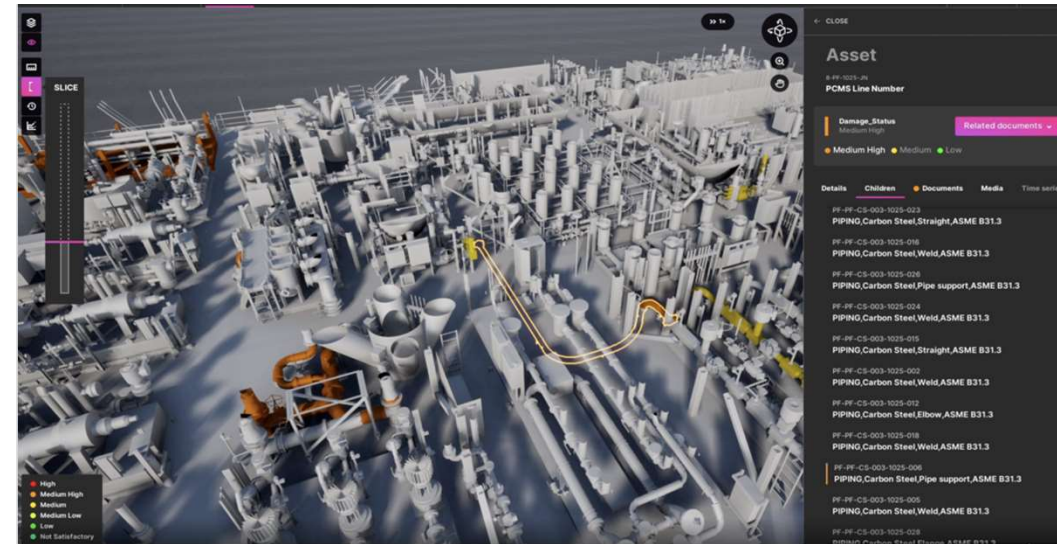
Reality





Our challenge lies not in the PoC phase of potential digital twin use cases, but how to execute the digital twins in a scalable, IT-like environment.

Digital Transformation Lead
at large industrial software & services org



Key IT/OT Considerations for Digital Twin Efforts:

- Digital Twin Scope & Roadmap
- Technology Stack & Ownership
- Data Quality & Trustworthiness
- Ongoing Maintenance and Enrichment
- Strategies for User Adoption

What is a digital twin?

The complete canon of information available and put in context for an asset or process



ACTIVITY PLANNING

Access to active and historical work orders



SEARCH & NAVIGATION

Full search and seamless navigation



LAYERS & FILTERING

Detailed & configurable views by personas



MEASURING

Accurate measuring done remote.



REAL TIME DATA

Real time with benchmark/predicted optimal



PHOTGRAMMETRY & COMPUTER VISION

Because reality is not the same as design



LIDAR/LASER SCAN

To complement/substitute CAD based 3D



ROBOTICS

To both capture data and to act on insights



Digital twins should not be about any **ONE** digital use case,

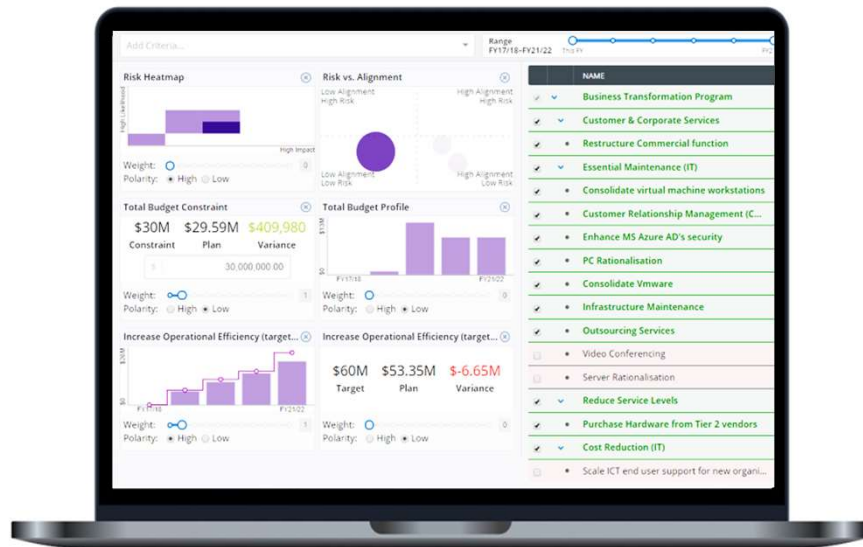
They are about launching, enabling, & scaling **100s** of digital use cases at low marginal costs

The collage displays a variety of digital twin and industrial data visualization dashboards. Key components include:

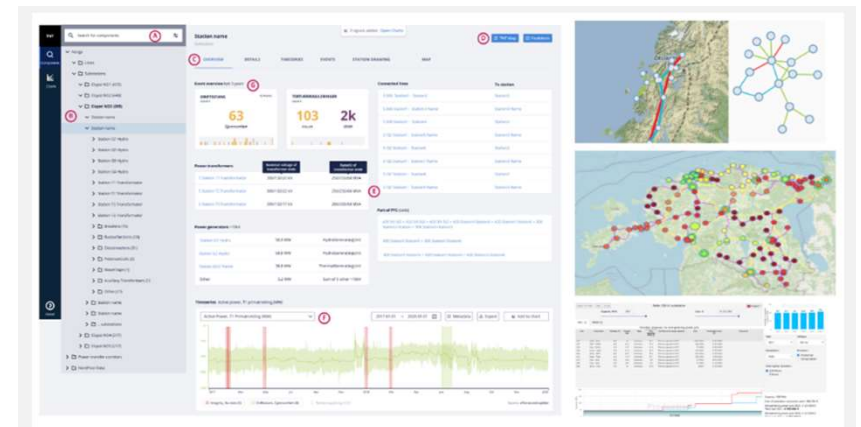
- Lube Oil Model:** A dashboard showing a 3D schematic of a machine's lubrication system with an 'Overall Anomaly Score' and a 'Selected Sensor Output' graph.
- Machine Service Overview:** A dashboard with a table of machine data, a 'Machine Filter' section, and a 'Time Filter' (Last 24 Hours, Last 48 Hours, Last Week, All Alarms). It also features a 'Deviation Categories' radar chart and a 'Distinct Alarms Count' table.
- 3D Model:** A detailed 3D rendering of a complex industrial machine with various components highlighted in different colors.
- 3D Ship Model:** A 3D visualization of a ship's hull and internal structure, with a caption: 'Filtering and interactive visualization of work order data in 3D view'.
- Wind Farm:** A 3D model of a wind farm with a wind turbine highlighted in yellow.
- Map:** A map showing a geographical area with various markers and a search bar.
- Table:** A table with columns for 'Time', 'Status', and 'Count', showing data for 'Critical Incidents' (37), 'VSL Increase Transit Time' (34), and 'Good Incidents' (272).
- Alerts:** A section titled 'Automated Identification & Reporting' showing alerts for 'BURNER (BURNER)' and 'MO_AirLouverControllerAir/EU/S002'.
- Line Graph:** A line graph showing data over time, with a peak around 1000.

A few examples from our experience...

Digital twin of project portfolio to simulate portfolio choices for different market and rate base constraints



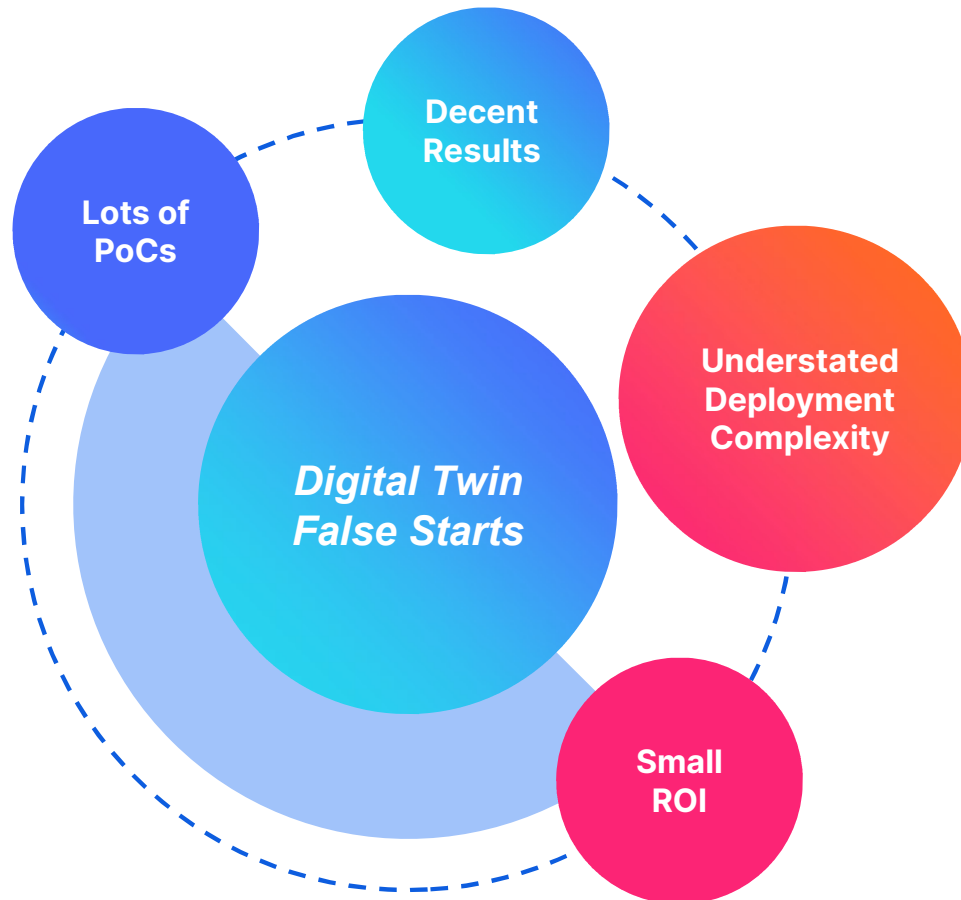
Digital twin of a transmission network for advanced power system analysis and querying in domain-specific language



CIM +
Operational Data

Extensible to
Sites & Assets

Operationalizing digital twins still remains a challenge



100s of Use Cases

- Ops Visibility & Smarter Alerting
- Streamlined Diagnostics & RCA
- Site-to-Site Performance Analysis
- Robotics & Automated Workflows

People Problems

- Digital Twin Developers are Not Digital Twin Users
- Unclear Ownership of Twin Enrichment & Management

Process Problems

- Digital twins are kept separate from business
- Limited re-usability of application work

Technology Problems

- Data stack is not designed to support needs of digital twins
- Data Quality, Trust, Context, Availability, Interoperability

Audience Poll:
**What other challenges have you had developing
and/or deploying digital twins?**

The building blocks for accelerated digital twin development and adoption

Clear strategic direction

1

Digital twin strategy aligned with enterprise strategy

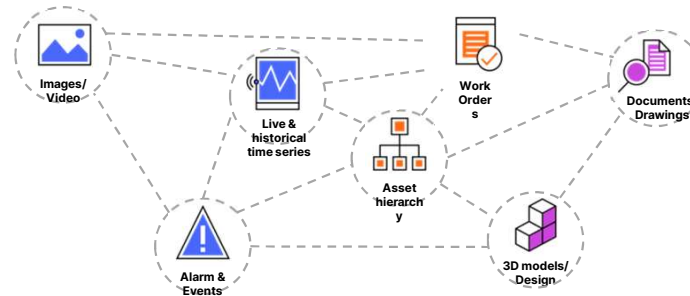
2

Digital twin innovation and product portfolio management

3

Ideation / digital twin engine

Funnel management



4

Operations integration and digital twin services

Industrialized innovation and operations integration

5

Talent and culture to drive problem solving mindset

6

Leadership commitment and early workforce engagement

7

Fit for purpose funding and risk management

Enablers for accelerated success

The building blocks for accelerated digital twin development and adoption

Clear strategic direction

1

Digital twin strategy aligned with enterprise strategy

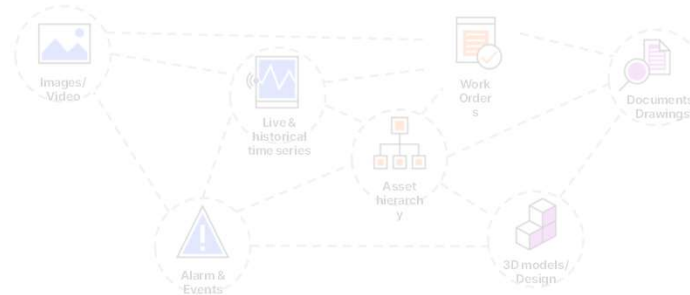
2

Digital twin innovation and product portfolio management

3

Ideation / digital twin engine

Funnel management



4

Operations integration and digital twin services

Industrialized innovation and operations integration

5

Talent and culture to drive problem solving mindset

6

Leadership commitment and early workforce engagement

7

Fit for purpose funding and risk management

Enablers for accelerated success

The building blocks for accelerated digital twin development and adoption

Clear strategic direction

1

Digital twin strategy aligned with enterprise strategy

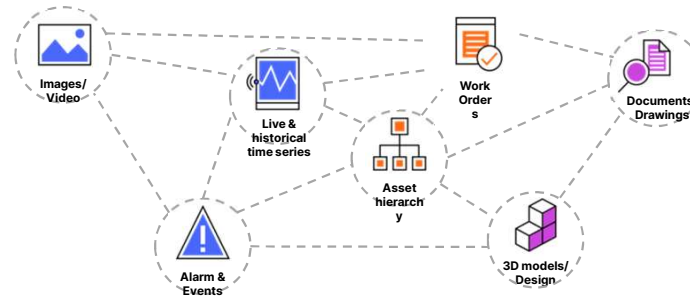
2

Digital twin innovation and product portfolio management

3

Ideation / digital twin engine

Funnel management



4

Operations integration and digital twin services

Industrialized innovation and operations integration

5

Talent and culture to drive problem solving mindset

6

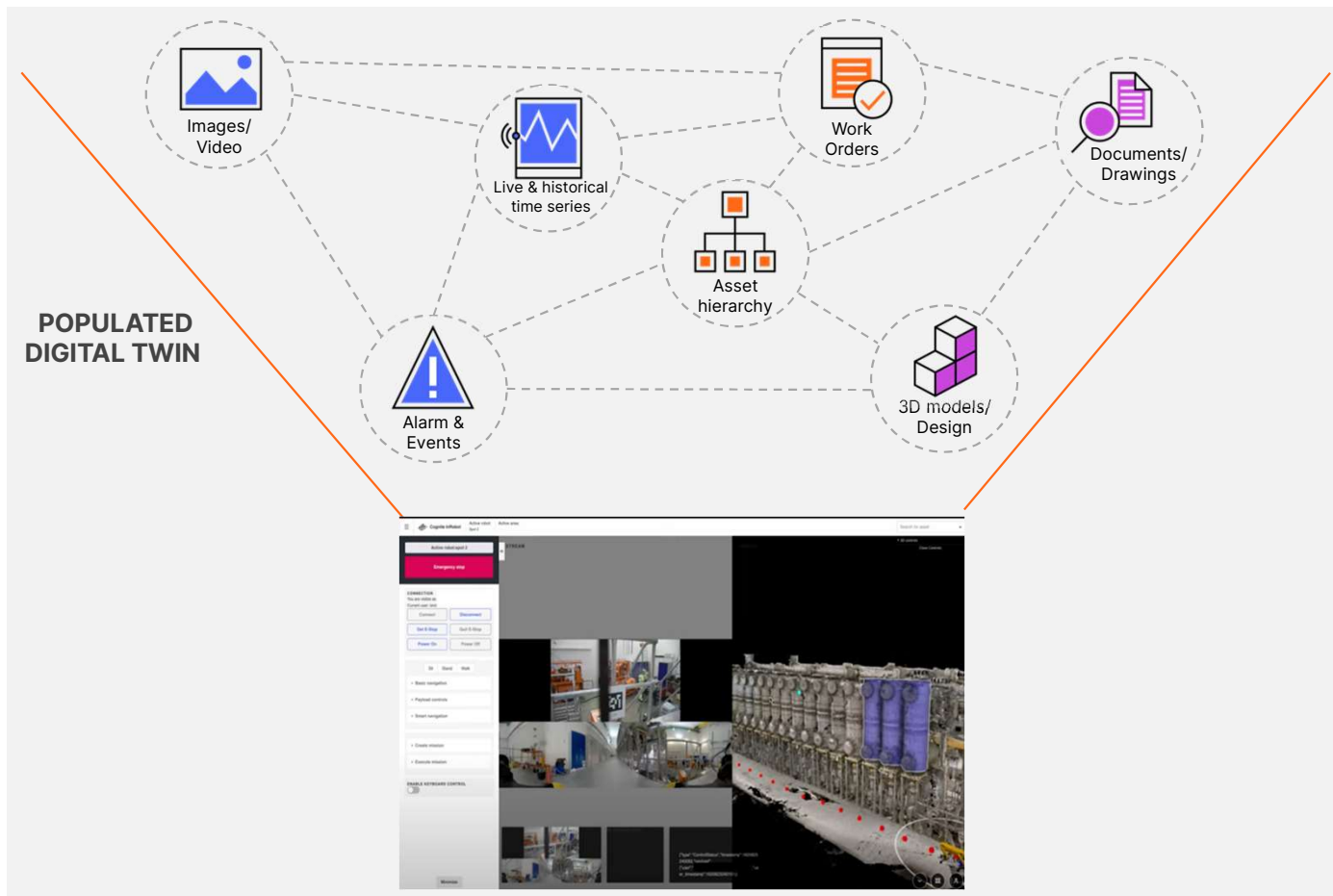
Leadership commitment and early workforce engagement

7

Fit for purpose funding and risk management

Enablers for accelerated success

What industrial data management capabilities are needed to efficiently build and scale use cases?



Automated building and maintaining of data relationships
AI-powered contextualization services

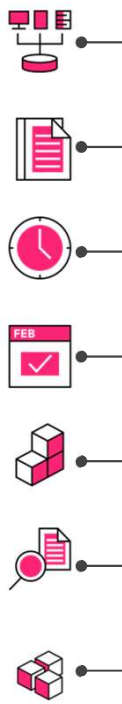
Interoperable system
Open APIs, connectors to adopted industry solutions

Data governance
"Data has no value unless business trusts it and uses it." - Forrester

Real-time data access
Highly optimized time series database for read and write.

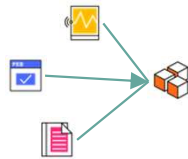
At the heart of a digital twin 2.0 platform is the means to create and manage real-time IT/OT/ET data relationships using automation

DATA SOURCES



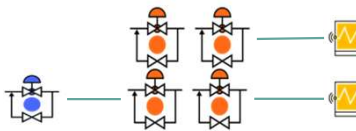
CONTEXTUALIZATION SERVICES

Match resource types



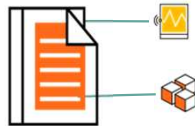
Automatic and expert guided mapping of resources (assets, time series, events, 3D nodes) to appropriate counterparts creating belongs-to-relationships

Contextualize P&ID's / Drawings



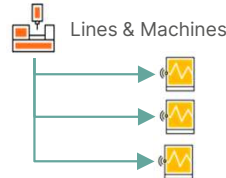
Parse P&ID's with the help of AI or augmented these data with your own experience to make interactive diagrams.

Contextualize documents



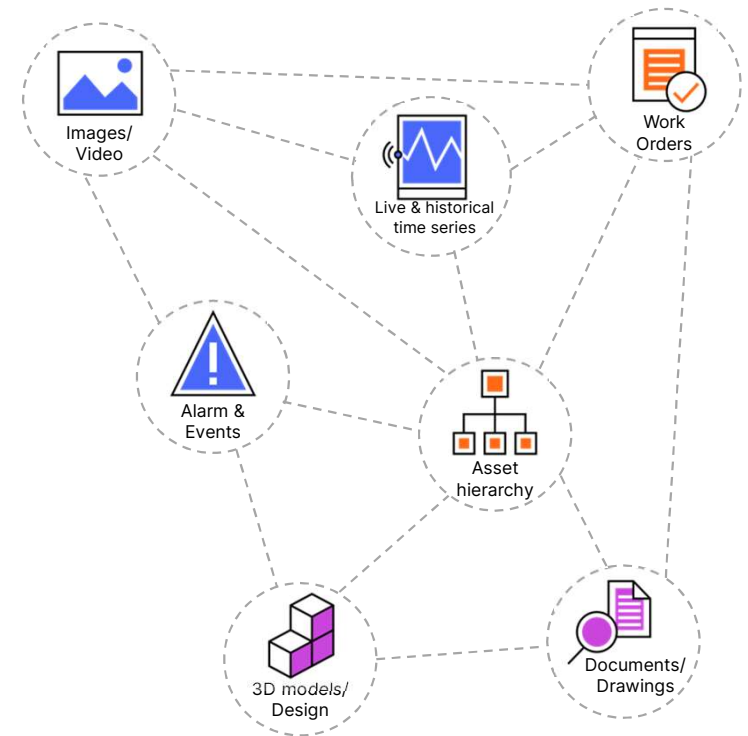
Recognize asset names in documents and contextualize them accordingly with the help of automatic models and OCR

Data templatzation

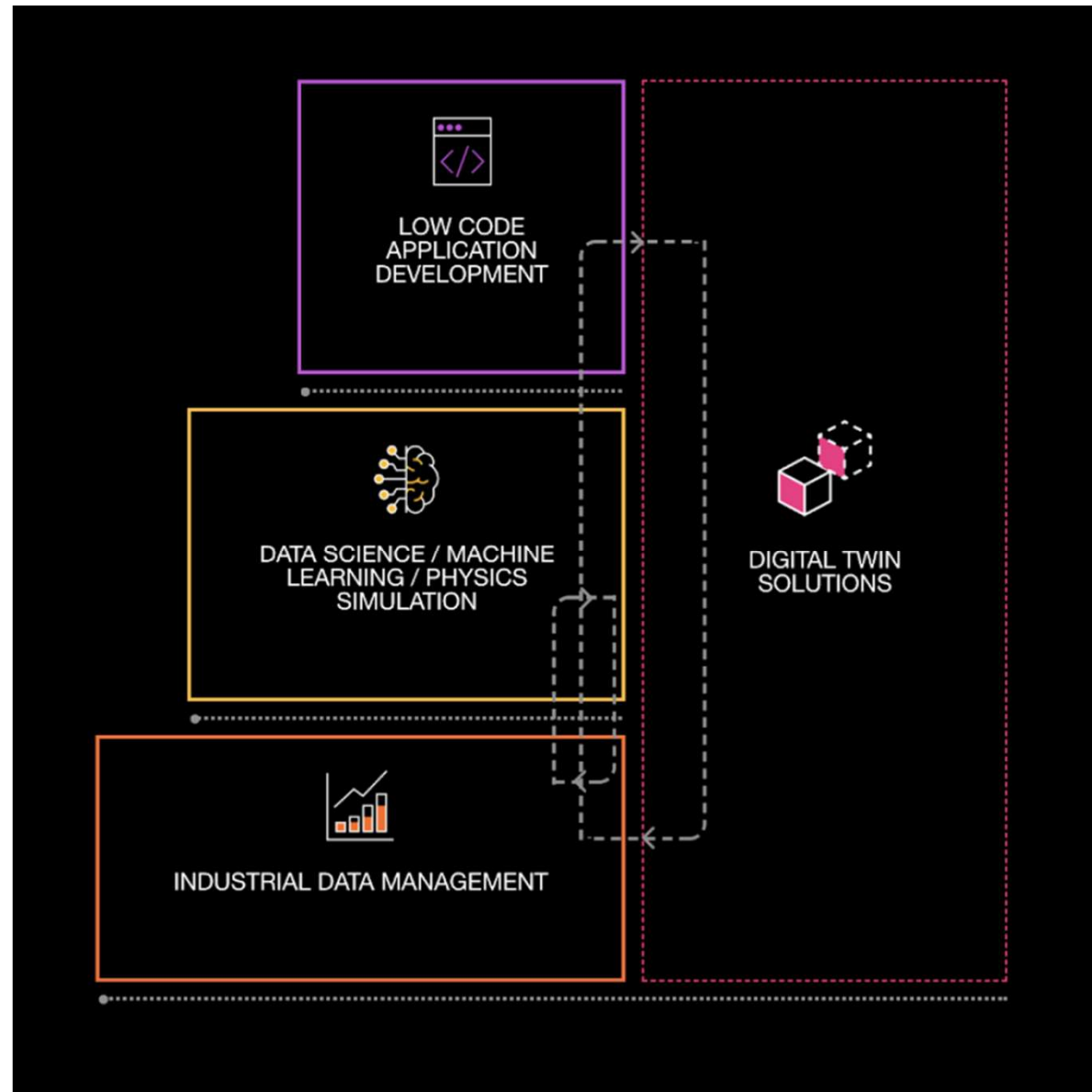


Manage and maintain data models (templates) at the enterprise level, application level and personal level. Template population is guided by AI.

POPULATED DIGITAL TWIN



Taking an open, interoperable approach is critical for a next-generation **digital twin platform**



The building blocks for accelerated digital twin development and adoption

Clear strategic direction

1

Digital twin strategy aligned with enterprise strategy

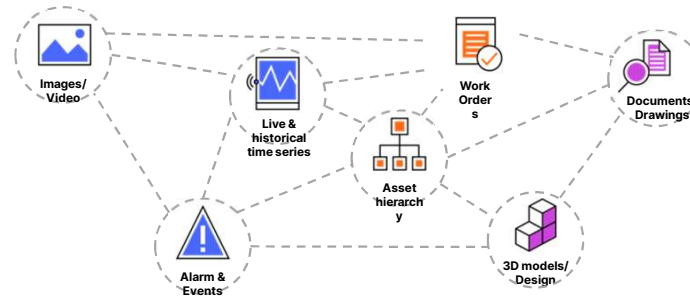
2

Digital twin innovation and product portfolio management

3

Ideation / digital twin engine

Funnel management



4

Operations integration and digital twin services

Industrialized innovation and operations integration

5

Talent and culture to drive problem solving mindset

6

Leadership commitment and early workforce engagement

7

Fit for purpose funding and risk management

Enablers for accelerated success



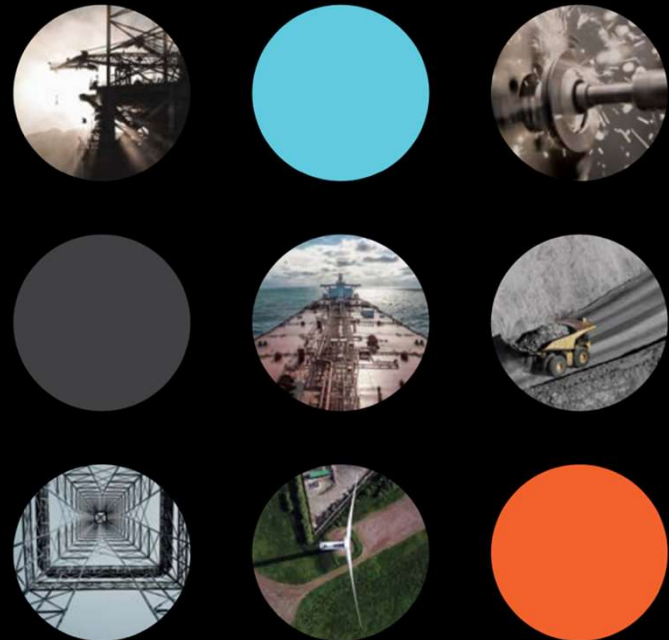
Audience Poll:

What building blocks are well-developed and where do you see gaps in your organization?



To learn more about how to build a digital twin platform **with trusted data that scales**, visit Cognite's booth in the expo hall.

The Definitive Guide to Industrial DataOps



Disruptive data management for business and operation executives in industry



Thank You

Gabe Prado - Cognite
Sr. Director, Product Marketing

Georg Baecker - Tetra Tech
Sr. Director, Utility Management Consulting