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GenAI and PI

Supercharging the Operational Digital Twin

Zev Arnold

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AVEVA

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Zev Arnold is a technology practitioner in Accenture Industry X with a focus in digital manufacturing and operations. In his career, he has helped manufacturing clients make improvements in performance and reliability, and helped secure their license to operate.

He has specialized in IT/OT data infrastructure and analytics, working with integrated operations and digital engineering initiatives across Industry 4.0 enterprises, including utilities, oil & gas, life sciences, mining, and consumer goods. His responsibilities have included digital program delivery, IIoT strategy, and value realization.

He has provided thought leadership on the use of OT data to drive business value and change through industry conference presentations, communities of practice, and project engagements. Within Accenture, Zev is the global lead for the AVEVA Operations Information Management capability.

Gartner: Operational Technology (OT)

Operational technology (OT) is hardware and software that detects or causes a change, through the direct monitoring and/or control of industrial equipment, assets, processes and events.

Improved Reliability	**Safe Operations**
Increased Process Performance	**Sustainable and Compliant**

Machine Intelligence Leaders achieve:

10-15% efficiency improvement

8-14% cost reduction

10% reduction in environment impact

McKinsey & Company : Toward smart production: Machine intelligence in business operations

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ACCENTURE & AVEVA strategic alliance

Accenture and AVEVA have collaborated as strategic alliance partner for over 10 years, working together across multiple industries and jointly investing to develop and deliver industry leading solution across the asset and operations lifecycle from engineering through to operations and control.

600+
AVEVA Practitioners
across the globe

2 $M investment **annually**
to grow the AVEVA Industry X Practice

250+ AVEVA projects
successfully delivered

Dedicated
Capability Leads for each key offering and region

Multiple cloud platforms supported,
including Azure and AWS

Dedicated Centre of Excellence, Assets & Accelerators
spanning AVEVA key product suites

Key Alliance Campaigns:

❖ Integrated Project Execution
❖ Project Control Tower
❖ Manufacturing Excellence
❖ Data Intelligence Platform
❖ Intelligent Asset Management

AVEVA PARTNER OF THE YEAR
2021 WINNER
Best Global Alliance

AVEVA PARTNER OF THE YEAR
2022 WINNER
Best Global Alliance

* No. of AVEVA skills per country

Callisto, E80, Oasys, Eclipse, T.A.Cook, Anser & Flutura Acquisitions
to accelerate our industry penetration in food and beverages, chemicals, utilities, mining and other process and discrete based manufacturing industries
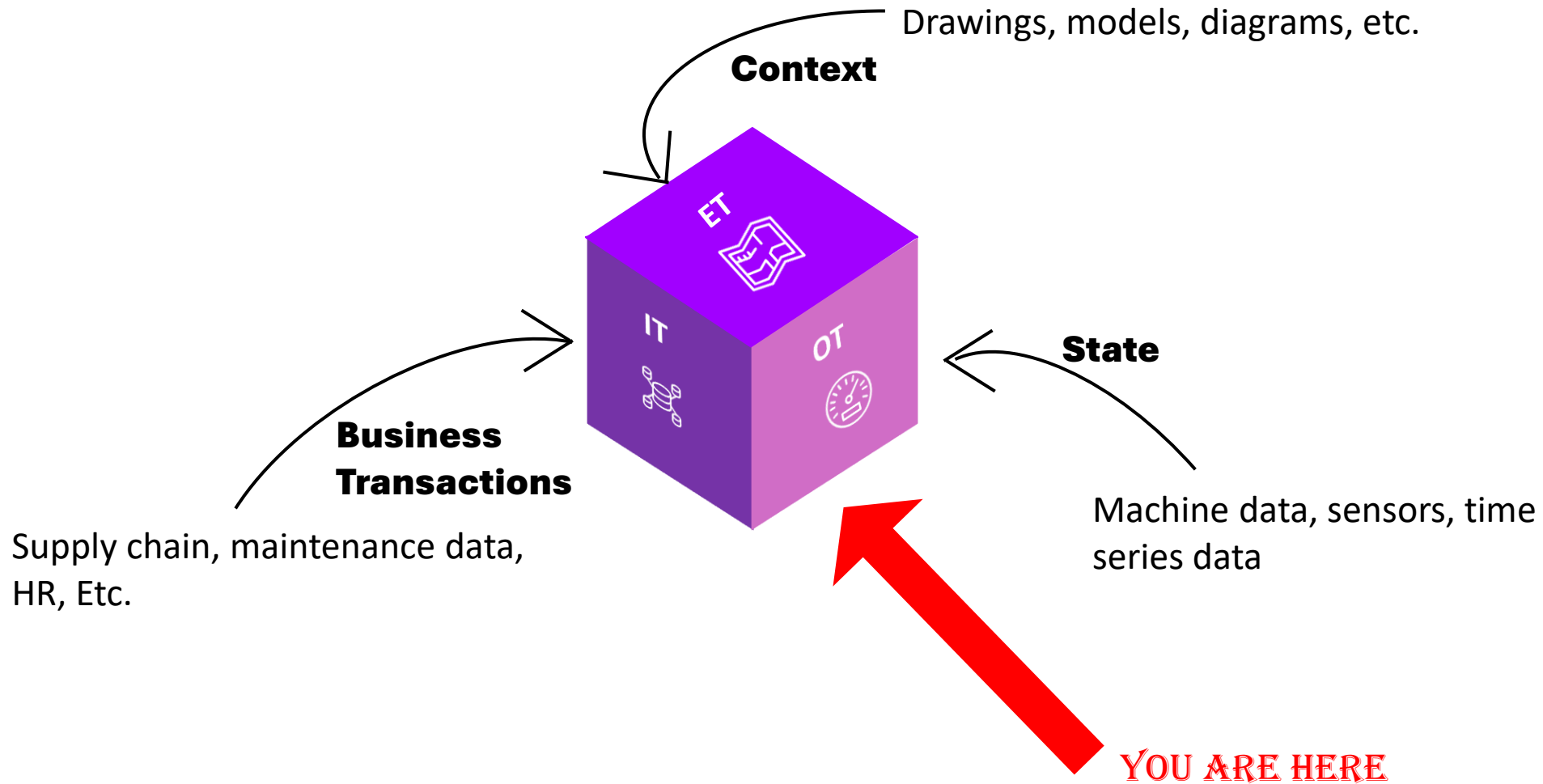
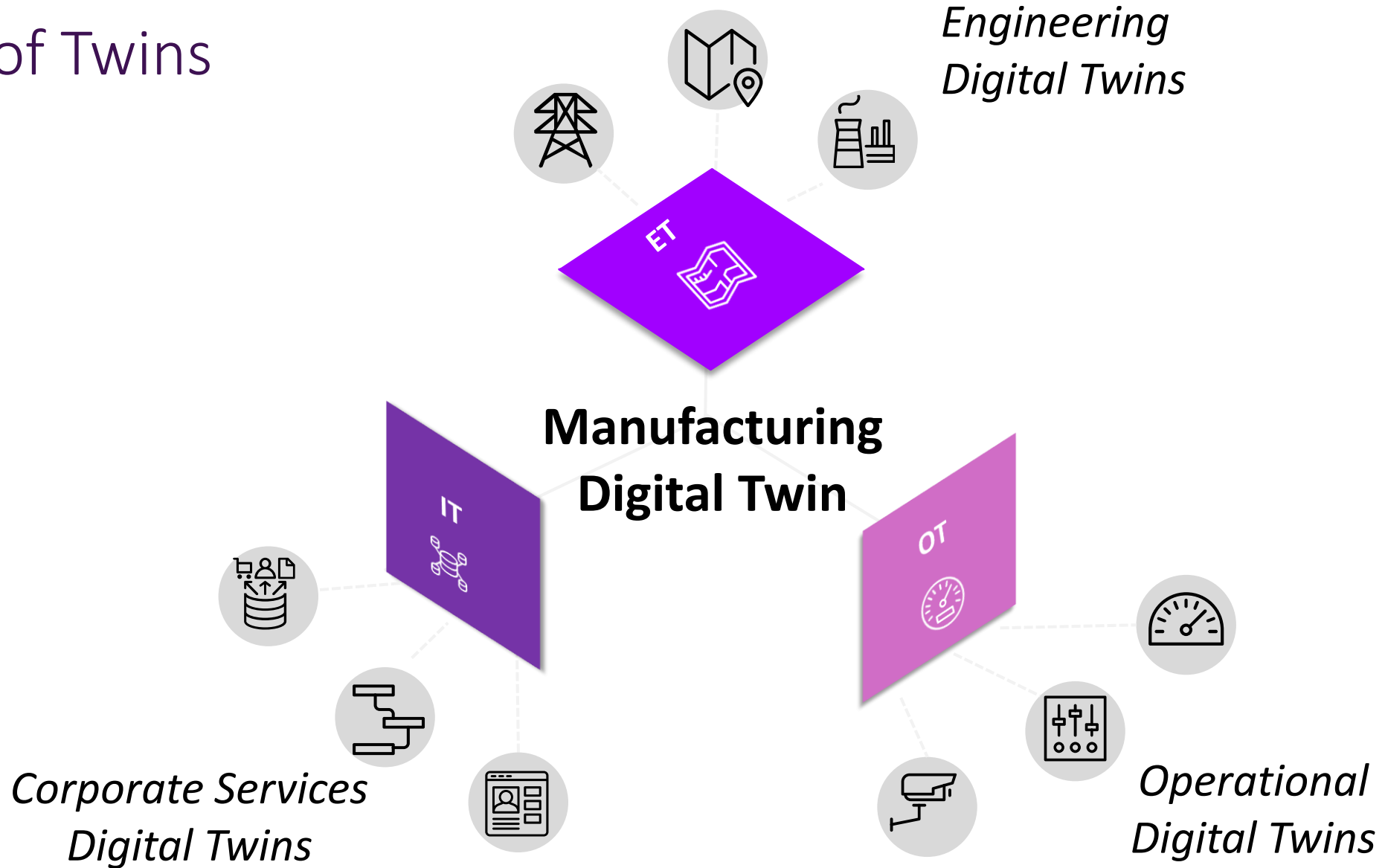**Industries** where AVEVA has a strong presence with Accenture:

AUTOMOTIVE · AEROSPACE & DEFENSE · LIFE SCIENCE · ENTERPRISE HIGH TECH · CHEMICALS · INDUSTRIAL EQUIPMENT · ARCHITECTURE ENGINEERING & CONSTRUCTION · CONSUMER PACKAGED GOODS & RETAIL · OIL & GAS

Accenture Industry X

AVEVA

IT/OT/ET

Context — Drawings, models, diagrams, etc.

State — Machine data, sensors, time series data

Business Transactions — Supply chain, maintenance data, HR, Etc.

YOU ARE HERE

Twin of Twins

Manufacturing Digital Twin

ET — *Engineering Digital Twins*

IT — *Corporate Services Digital Twins*

OT — *Operational Digital Twins*

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Industry 4.0

The Internet Of Things

Cyber-physical Systems
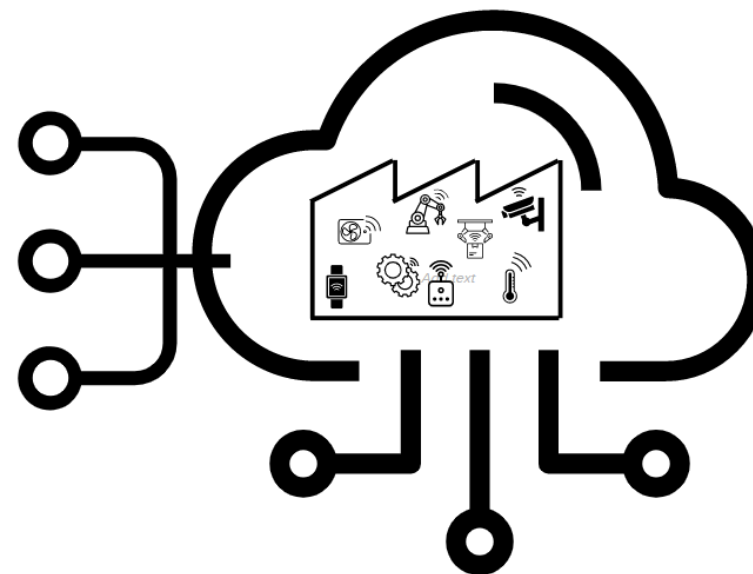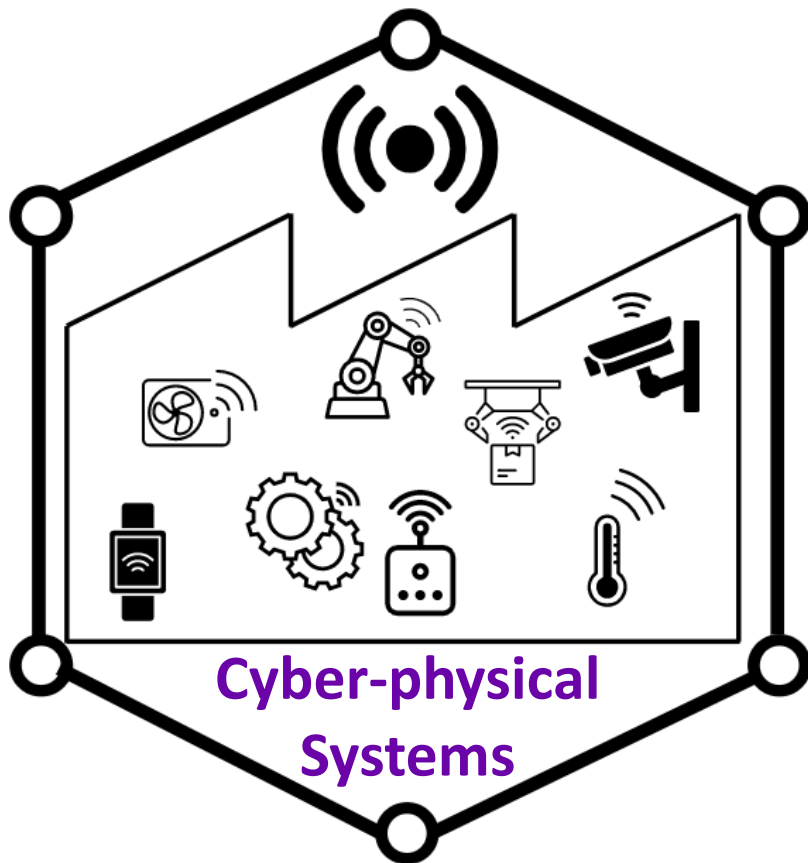
Smart Factory (Digital Twin)

The Internet Of Services
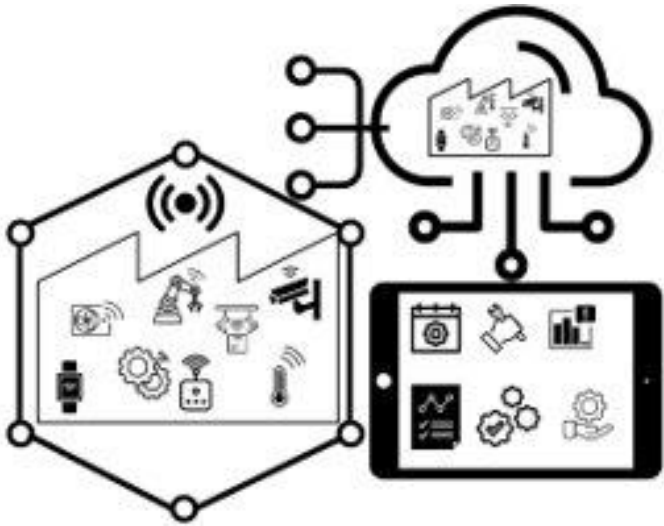
M. Hermann, T. Pentek and B. Otto, "Design Principles for Industrie 4.0 Scenarios," *2016 49th Hawaii International Conference on System Sciences (HICSS)*, Koloa, HI, USA, 2016, pp. 3928-3937, doi: 10.1109/HICSS.2016.488.

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Operational Digital Twin

…coordinates **cyber-physical systems**, over the **Internet of Things**, to enable an **Internet of Services** that **assists** people and machines in the **execution** of their tasks.

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Case Study : Digital Twin vs "Just another plant app"

Digital BOP

COMPANY and GOAL

_____ provides well delivery support and wanted to improve the **reliability of blowout preventers** in their drilling contractor fleet.
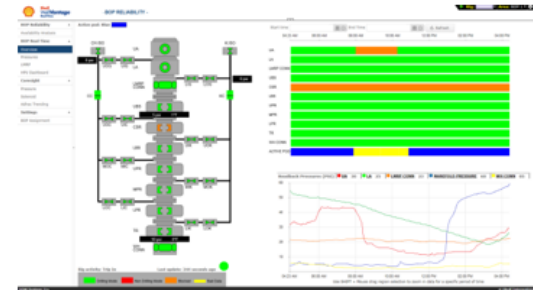
CHALLENGE

Manual data reporting provided an incomplete understanding of BOP health and usage.

- Pressures and Temperatures available only via daily readings.
- Usage information limited to best-guess based on time.
- Failures not detected until they exhibited functional symptoms.

SOLUTION

Using the PI System as a data engineering toolkit, Shell implemented a BOP monitoring application.

- Three custom dashboards
- PI Coresight™ screens for ad-hoc trending
- Significant data processing to derive information from data

RESULTS

First instance of onshore detection of a control fluid leak in the industry.

- Onshore monitoring of regulatory testing
- Collection of previously unavailable usage information
- Organizational awareness of BOP health

Operational Digital Twin

Innovation Cycle
discover
refine
deliver

…coordinates **cyber-physical systems**, over the **Internet of Things**, to enable an **Internet of Services** that **assists** people and machines in the **execution** of their tasks.

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Hype Cycle for Manufacturing Operations Strategy, 2023

AVEVA PI is foundational to the Operational Digital Twin *today*

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Use Case Identification

Navigation vs. Solution Hierarchy

The Two Use Cases for OT Conceptual Modeling
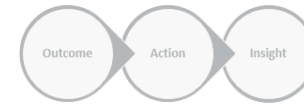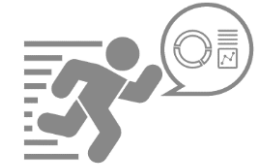
Navigation Use Case
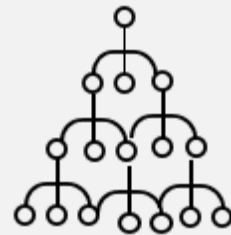
- Top Down Approach
- Solve for Browsability
- Improvement on Tagnaming Convention
- "Most users can find Most data Most of the time"

Solution Use Case
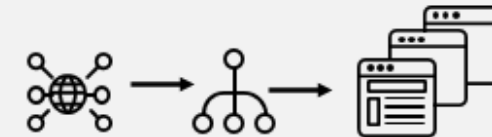
- Addresses a Specific Use Case
- "Fit-for-purpose"
- Foundation for expansion & scale
- Enables Analytics & data transparency

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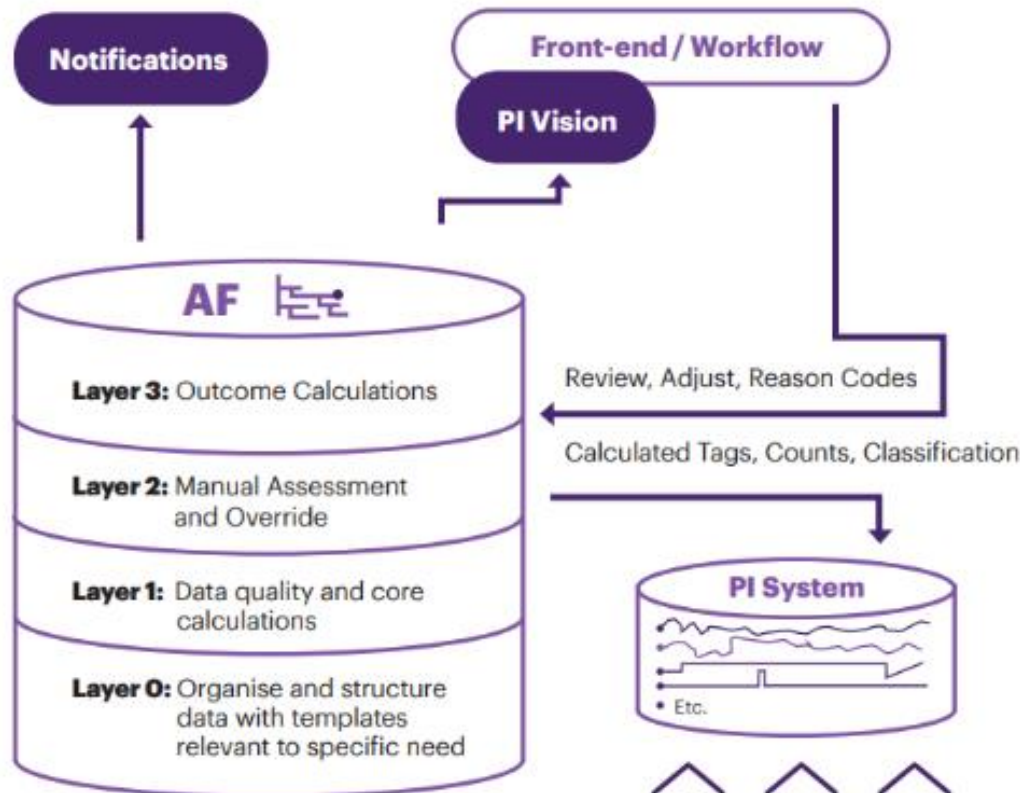# Breaching the OT Mega Silo

PI Asset Framework – Delivering OT Conceptual Models at Scale

Use Case Identification

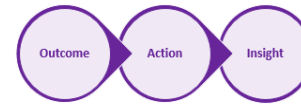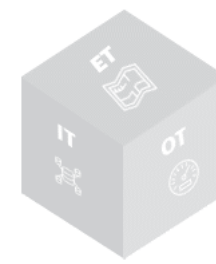Data Mega Silos
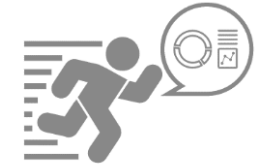
Data Culture

KEY BENEFITS

- ✓ **Functionality encapsulated in layers**
- ✓ **Easy to expand**
- ✓ **Traceable data in steps**
- ✓ **Data into insights via layers of calculations**
- ✓ **Manual overrides built into layers for flexibility**
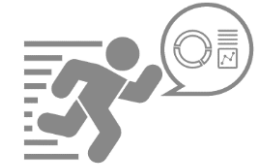
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Self-service Solution Development
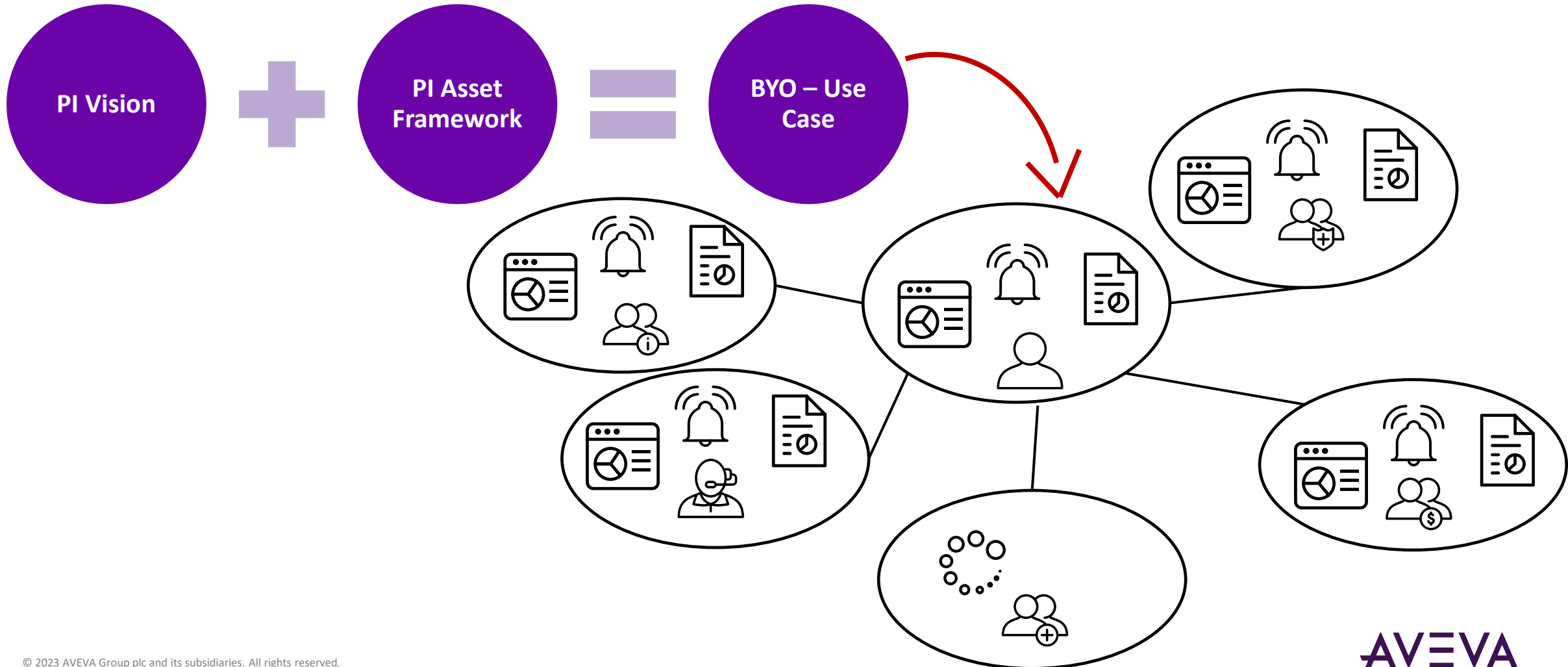
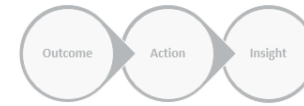## Let your users find their own use cases

Use Case Identification

Data Mega Silos

Data Culture

PI Vision **+** PI Asset Framework **=** BYO – Use Case
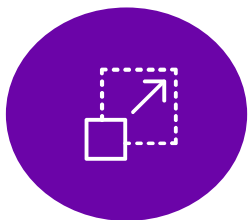
AVEVA
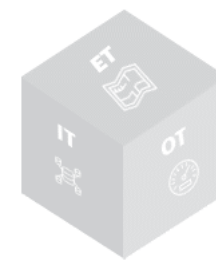
Data culture

Empowers users
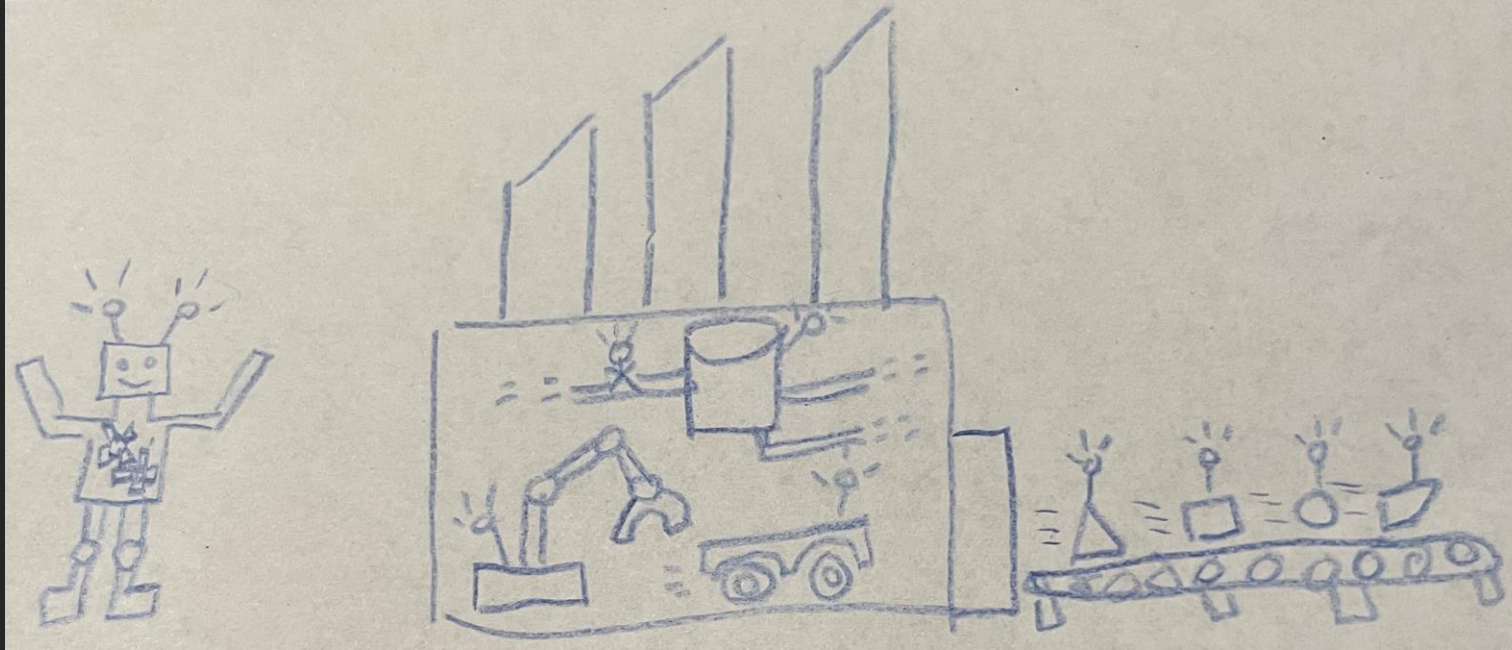
Co-opt them as change agents

Scale forever

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Generative AI will revolutionize the Operational Digital Twin
in the future

AV≡VA

Prompt: Draw the Fourth Industrial Revolution (4IR)

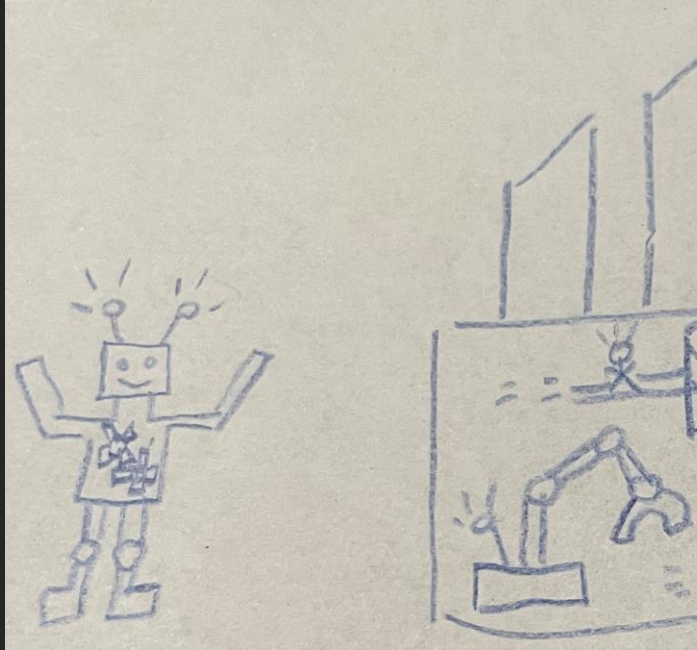**Zev Arnold**

Freelance artist

Prompt: Draw the Fourth Industrial Revolution (4IR)

Zev Arnold

Freelance artist

Generative AI @ Accenture

FY24 PI System/ OT Data Experiments

Accenture to invest $3B in AI

AIOps for IIoT

Key Takeaways:
- Built on top of AVEVA DataHub
- Use Case: Monitor PI System and identify data real-time
- Microsoft Teams integrated AI Chatbot

Next-gen Notifications

Key Takeaways:
- Extend the AIOps for IIoT framework for a general use case
- Relevant to all PI users
- Microsoft Teams Chatbot becomes the preferred PI interface

Generated Hierarchies

Key Takeaways:
- Use AI to map tagnames to equipment definitions
- AI to map engineering diagrams to hierarchies

Generated Data

Key Takeaways:
- Use AI to outperform previously difficult to simulate OT data
- Automate KPI creation

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