



AVEVAWORLD

ACCELERATE INDUSTRIAL INTELLIGENCE

Vianode

Building the Digital Foundation for an AI-Ready Battery Gigafactory

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Industry



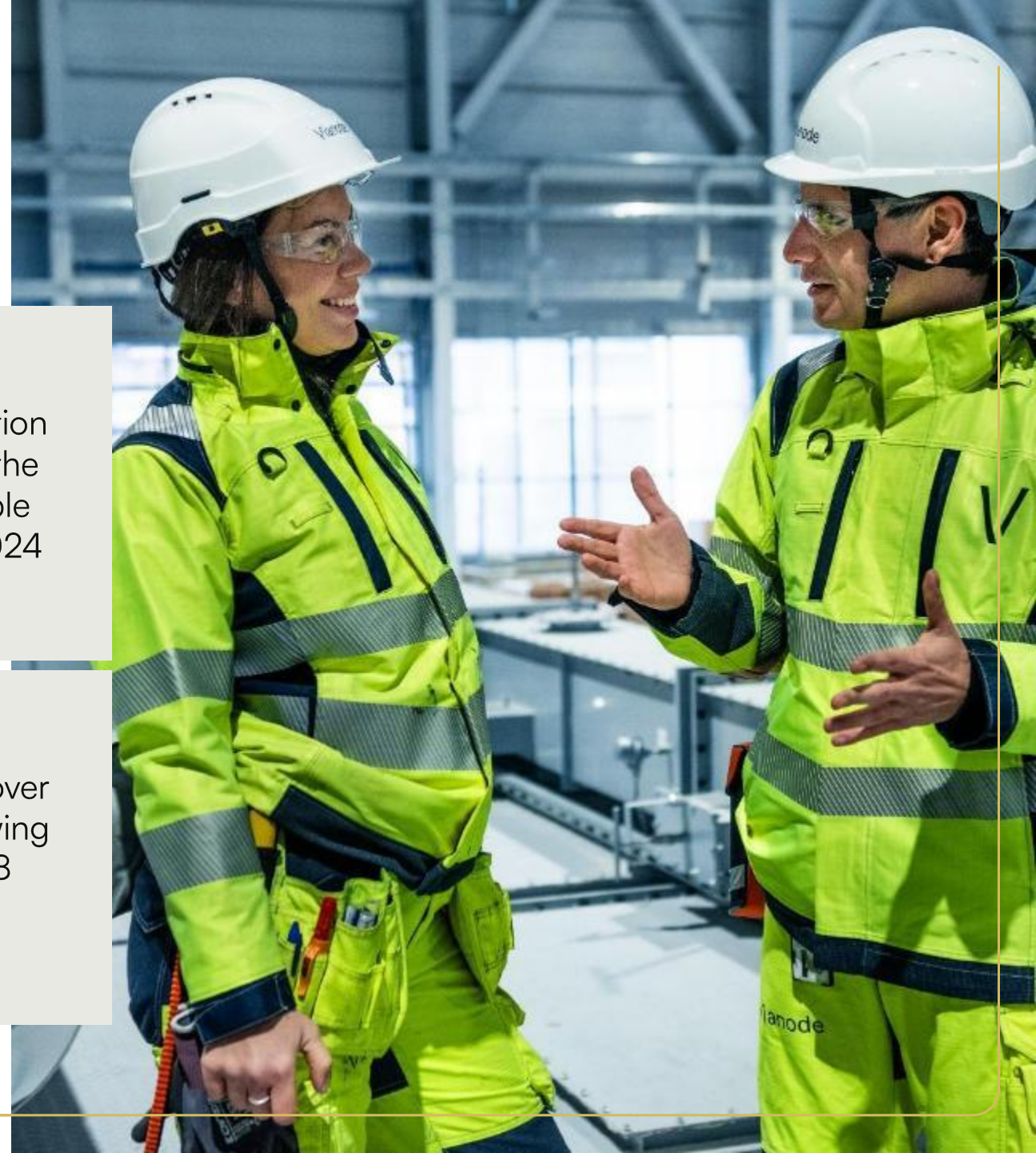
Sustainable high-performance anode graphite solutions

Synthetic anode graphite solutions for the battery and EV value chain

Industrial pilot in operation since 2021, operating the world's most sustainable graphite plant since 2024

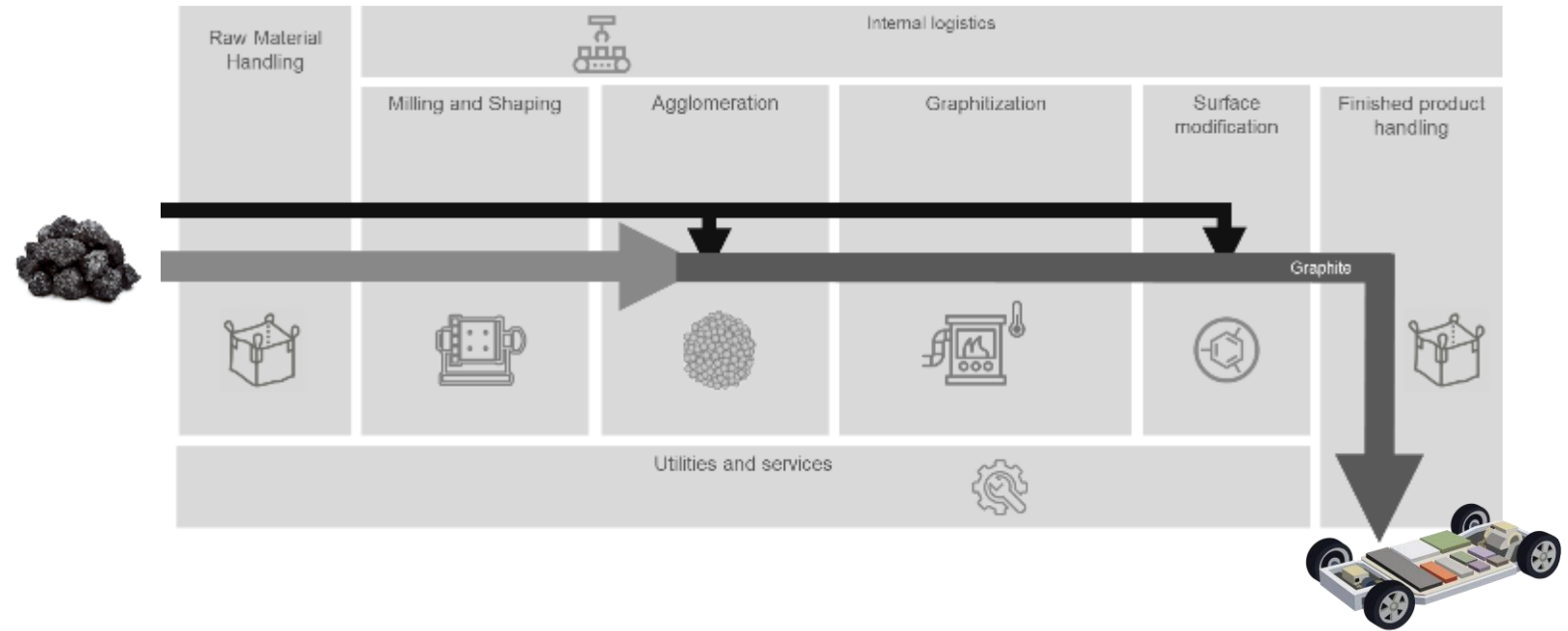
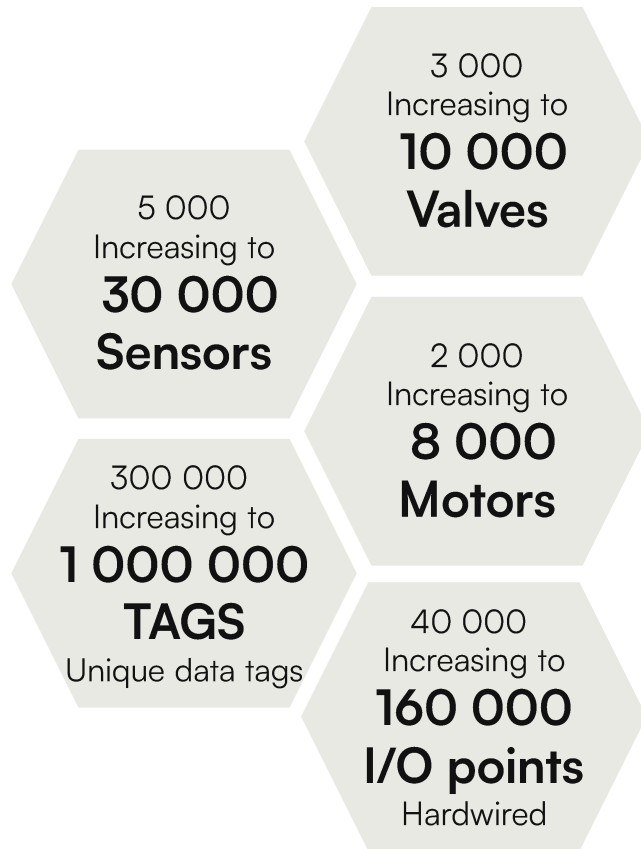
Developing large-scale sustainable production in North America and Europe enabling resilient local value chains

250+ employees with over 20 nationalities — growing towards 500 by 2028



Why This Matters

Scale turns automation into an information challenge



At this scale, the challenge is not collecting data — it is making data usable

The Real Challenge

AI does not fail because of ambition — it fails when industrial context is missing

fragmented systems

siloed data

inconsistent tagging

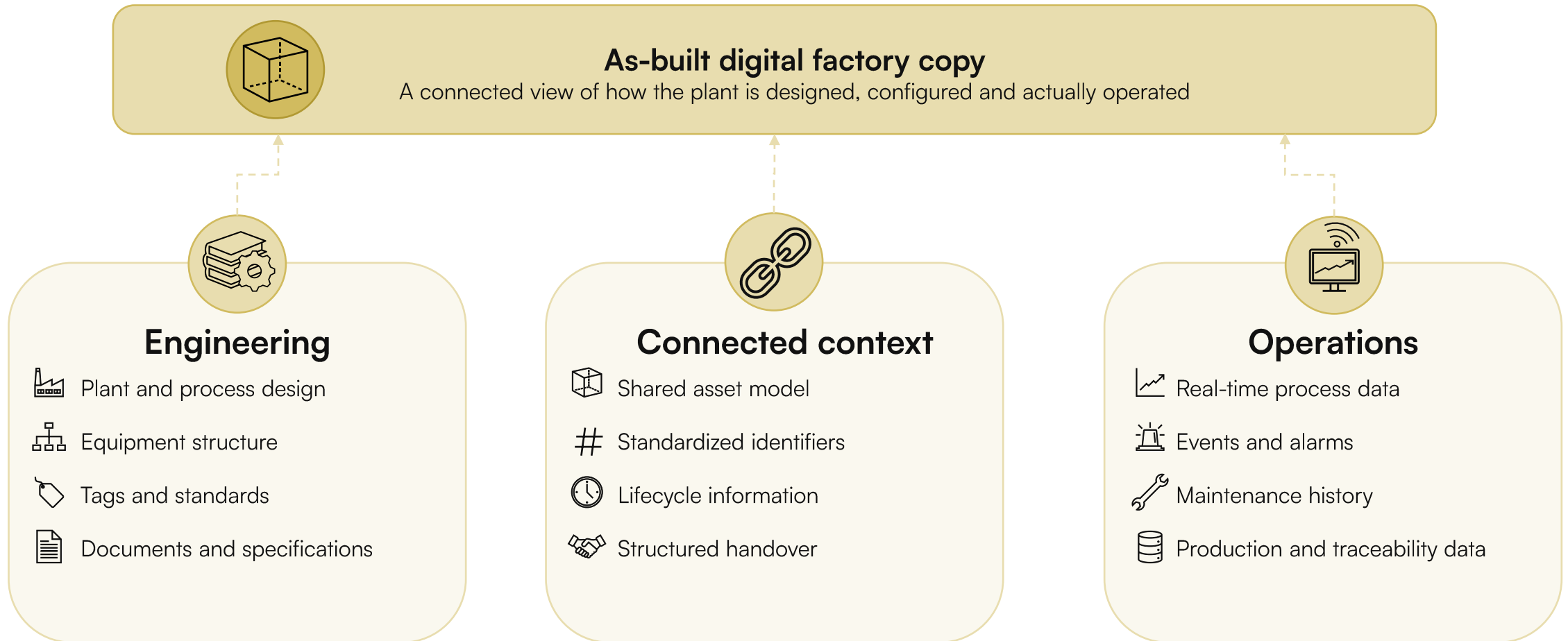
poor lifecycle information

disconnected engineering and operations

missing context



Connected data builds the as-built digital copy of the factory



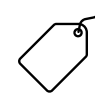
When engineering and operations stay connected through data, the factory becomes traceable, optimizable and AI-ready

Digital foundation platform with standardization in mind

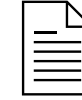
STRATEGIC REQUIREMENTS



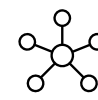
Data
centricity
(data vs documents)



Unique tagging
& asset identity



ALIM / LCI as
contractual
requirements



Integrated
IT/OT data



Cyber security
by design

BUSINESS CAPABILITIES



**Rapid
engineering**

Time to market



Soft sensing

Product quality & safety



Simulation

Design validation, training
& bottlenecks



**Predictive
maintenance**

OEE, Reliability, Safety



Track & Trace

Genealogy, recall &
sustainability



**Efficiency
improvement**

Data-driven work
reduction

FOUNDATION ENABLERS

STANDARDIZED INFORMATION



Common data model,
Semantics & naming
(ISO 81346)

LIFECYCLE INFORMATION (LCI)



Complete & connected
from engineering to
operations

DATA INTEGRATION



Seamless IT/OT
integration
(ISA-95 / OPC UA)

DATA MANAGEMENT



Contextualized,
trusted & governed
data

CYBERSECURITY BY DESIGN



IEC 62443
Defense in depth
By design

ALIM & HANDOVER



Structured handover
from project to
operations

INTERNATIONAL STANDARDS



ISA-95
Enterprise-control
integration



ISO 81346
Structuring & designation
(Tag standard)



IEC 62832
Digital factory
framework



IEC 62443
Industrial cyber
security



ISO 19650
Information management
In construction



ISO/IEC 27001
Information Security
management



IEC 61511
Functional safety



IEC 62541
OPC UA / industrial
interoperability



Digital Foundation Platform
Built on standards. Designed for scale. Ready for AI

Industrial AI Starts with Architecture

AI readiness depends on structure, context and interoperability

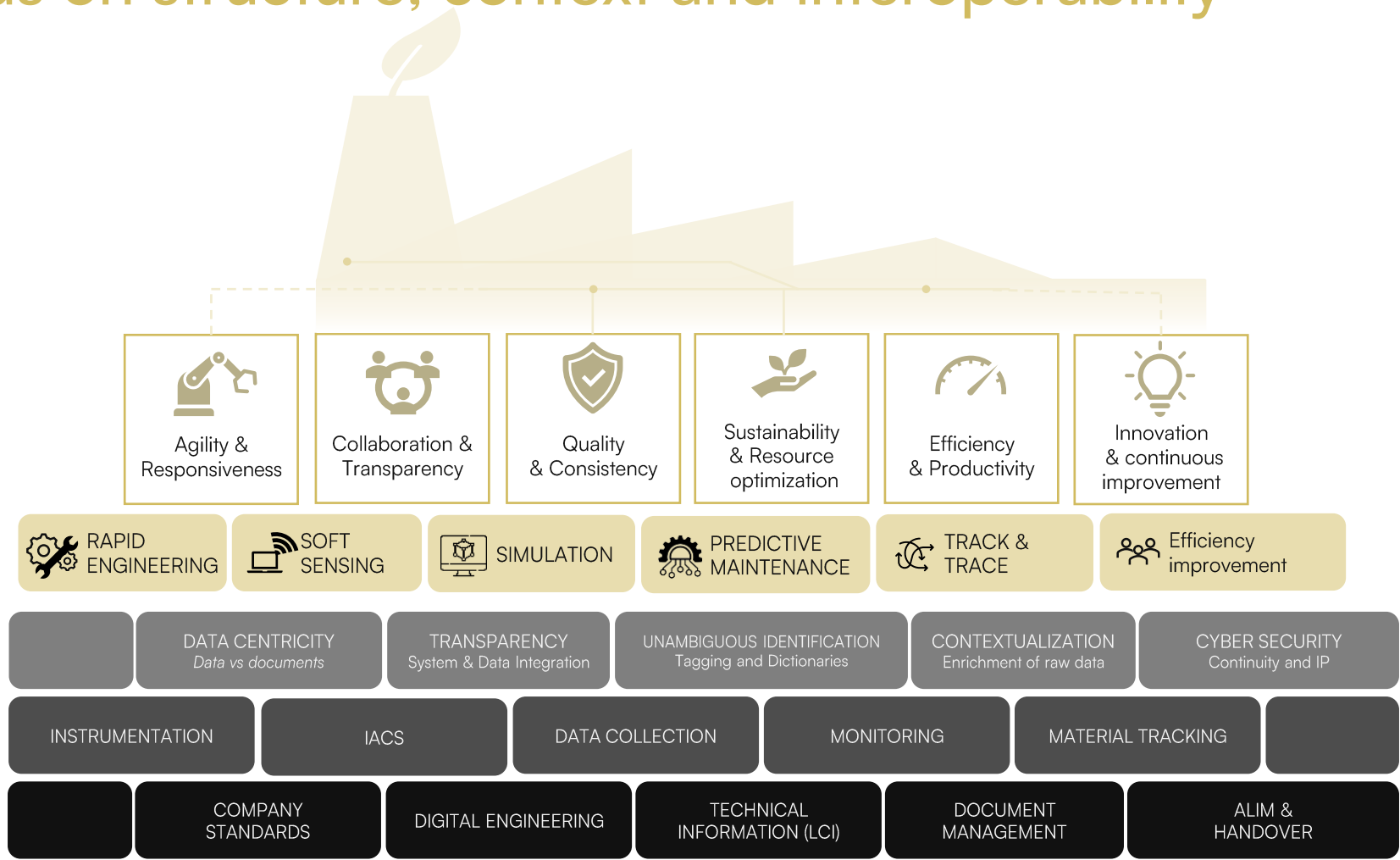
architecture

semantics

contextualized data

lifecycle information

interoperability



Architecture is what turns data into scalable AI readiness

Convergence Without Ownership Becomes Fragmentation



Building the digital foundation together

Vianode owned the ambition and architecture, supported by AFRY and AVEVA in complementary advisory and delivery roles

Owner

Vianode

- Set the industrial ambition and business priorities
- Own IT/OT/IACS architecture and governance
- Define requirements for data, traceability and scale-up
- Drive the roadmap toward Industrial AI

Industrial Partner



- Bring industrial automation and process-domain expertise
- Translate factory needs into executable standards, and solutions
- Support design, implementation and system integration
- Strengthen execution across engineering, automation, OT and cybersecurity

Technology + advisory partner



- Provide the industrial software platform foundation
- Advise on architecture, standards and scalable best practices
- Support information models, contextualized data and lifecycle thinking
- Enable PI, AIM, MES, Operations Control and CONNECT as part of the foundation

What this enabled



Operational data foundation



Lifecycle information context



Execution and traceability



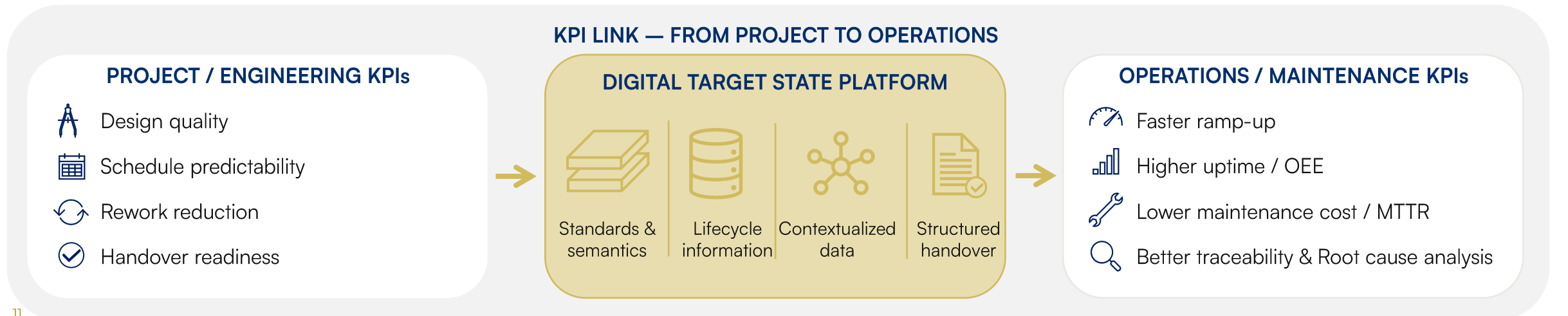
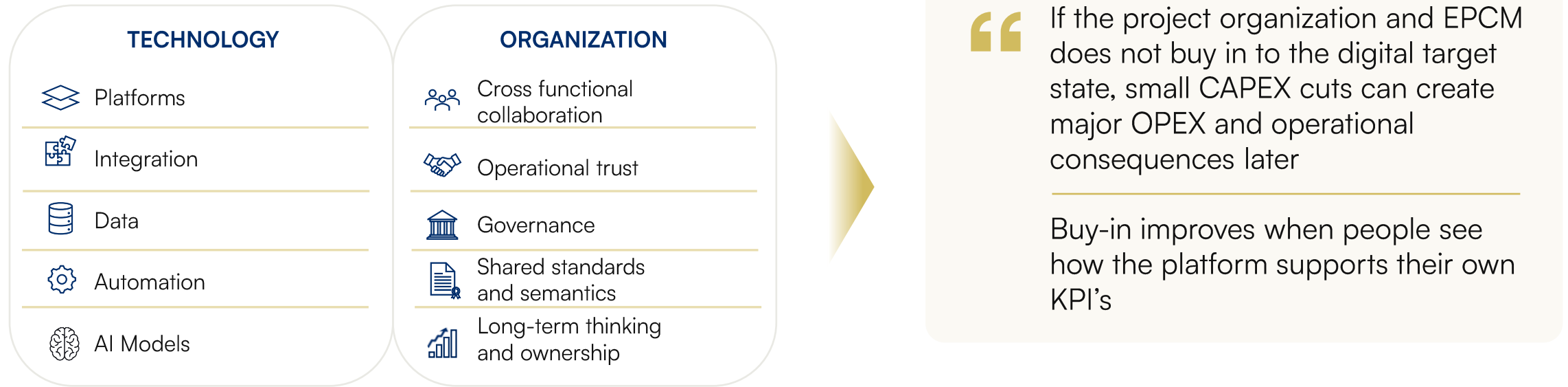
Scalable industrial data sharing



AI-ready architecture

Technology is not the hard part

Industrial AI requires organizational alignment - also in project execution



From Digital Foundation to Industrial AI

When industrial data has structure, context and ownership, AI can support stable, scalable and lean operations

DIGITAL FOUNDATION



Structured industrial data



Engineering + operational context



Governed Ownership



Trusted lifecycle information



One shared source of truth



Operational awareness & stability

Creates a shared and timely understanding of plant conditions, stability, losses and constraints.

Value: Faster response and more stable performance across shifts and units



Quality & inspection intelligence

Supports early and consistent quality understanding using inferred measurements and visual signals as decision support

Value: Fewer quality escapes and less manual interpretation



Predictive & preventive advisory

Anticipates future risks and degradations to enable proactive planning and risk-based prioritization.

Value: Fewer unplanned events and stronger preparedness



Root cause & diagnostic intelligence

Explains why deviations, losses or incidents occur by correlating process behavior, asset states and historical events

Value: Corrective actions address causes, not symptoms

The real value is not more data

It is trusted industrial context that enables stable, scalable operations — with fewer people, faster decisions and less variation.

Vianode accelerates sustainable battery material scale-up with an AI-ready digital foundation

Challenge

- Scaling from pilot to gigafactory production created massive industrial data complexity
- Fragmented engineering, automation and operations data risked limiting traceability, scalability and AI readiness
- Inconsistent tagging, lifecycle information and system ownership could create integration debt across future sites

Solution

- Built a standardized digital foundation connecting engineering, lifecycle and operational data with **AVEVA Asset Information Management, AVEVA™ PI System™, AVEVA Manufacturing Execution System and AVEVA System Platform**
- Established common standards for tagging, IT/OT integration, cybersecurity and contextualized data across the factory lifecycle

Results

- **Established a scalable architecture for industrial data across engineering, automation and operations**
- **Reduced future integration debt by defining common standards before full-scale factory execution**
- **Enabled traceability, predictive maintenance, soft sensing and real-time optimization use cases**
- **Strengthened AI readiness through contextualized, governed and reusable industrial data**



Vianode

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