

Die digitale Fabrik für Jedermann

Webinar | 16.10.2024

Bosch | 2024 © Bosch Software and Digital Solutions



Mastering the Art of Digital Transformation

The Bosch Group is a pioneer of Lean Manufacturing, Sustainability and Industry 4.0. We want to show how we achieved our Digital Transformation.



Oscar Garcia

Principal Consultant

Bosch Software and Digital Solutions

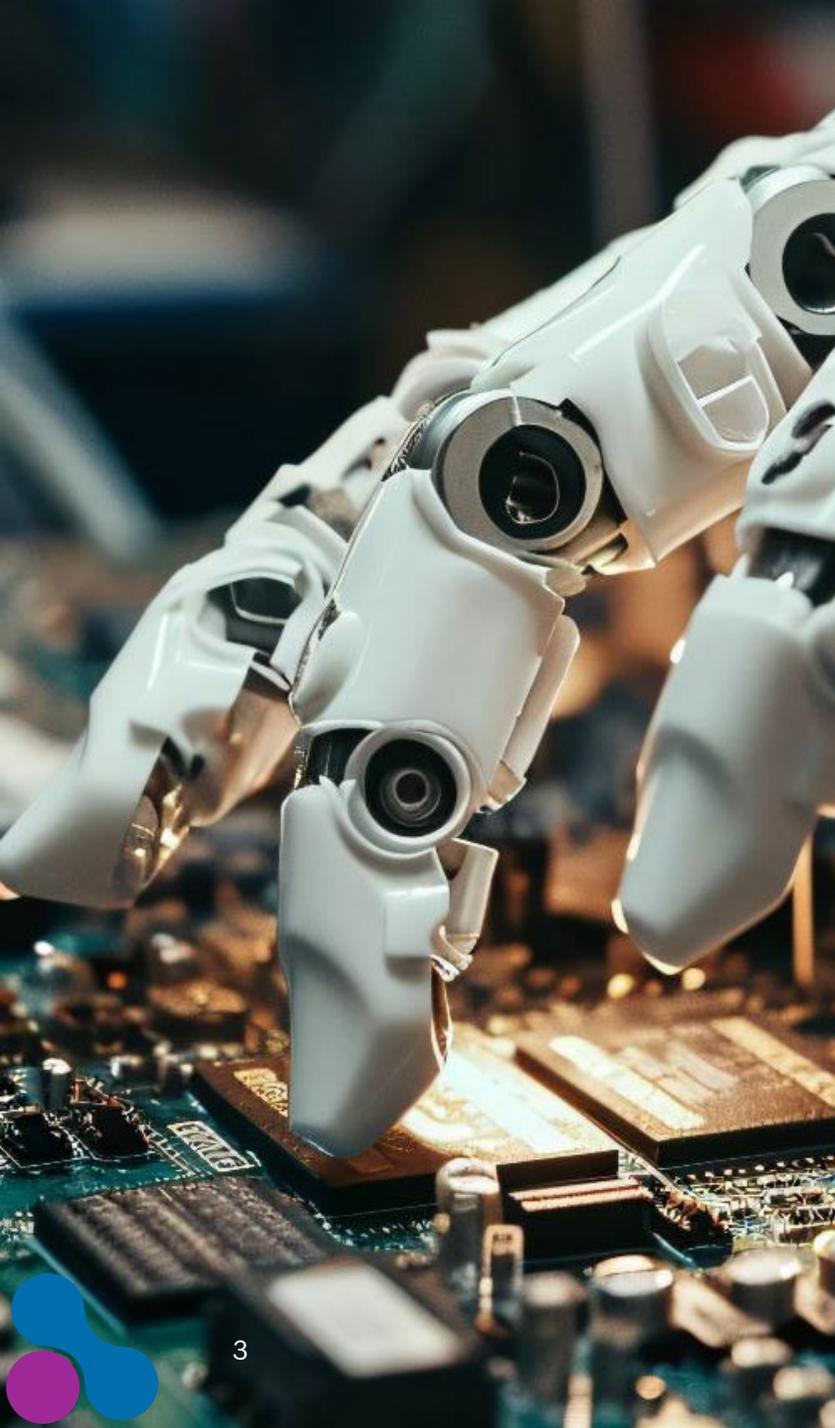


Kai Hackbarth

Head of Products and Solutions

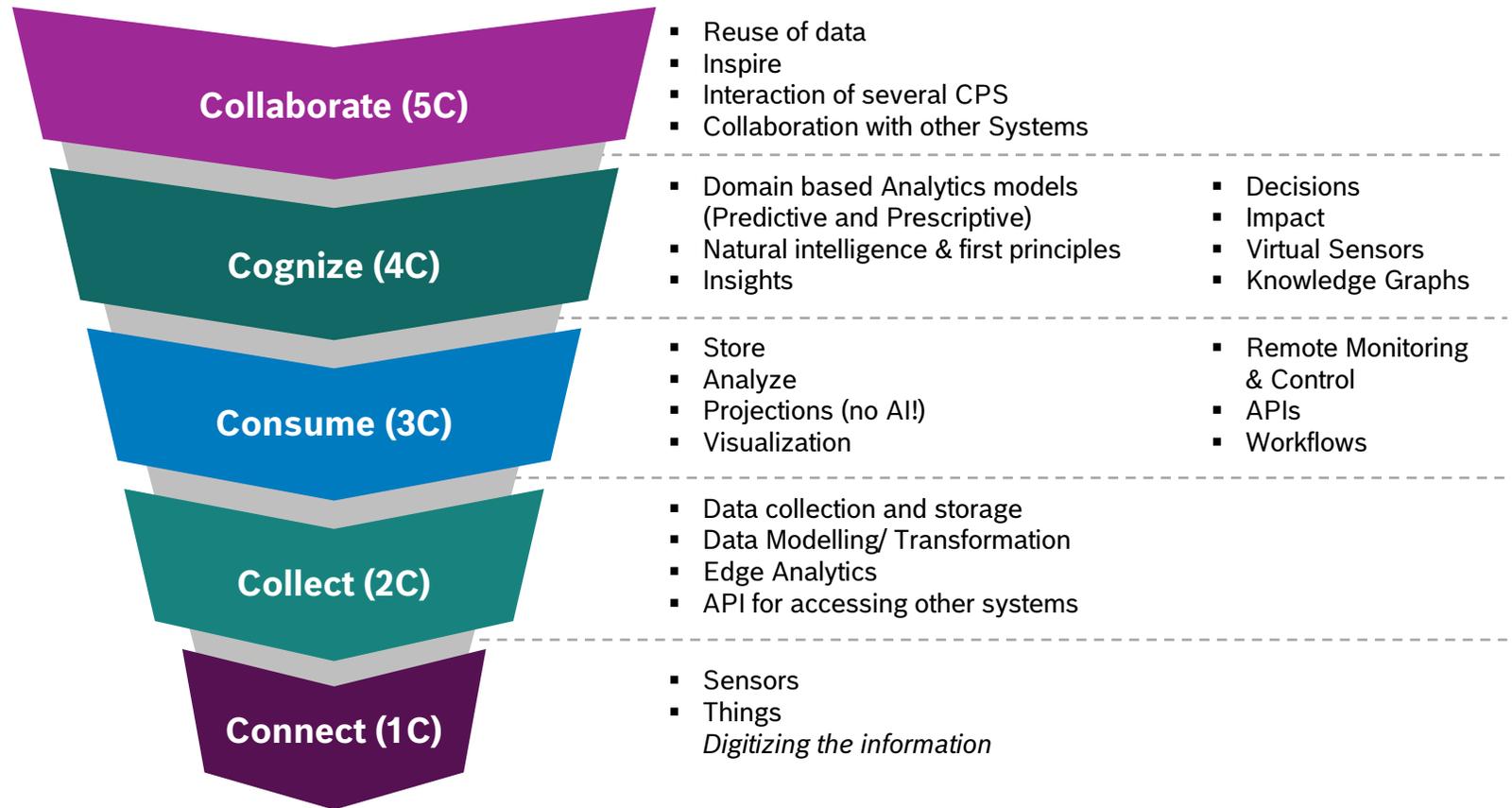
Bosch Software and Digital Solutions



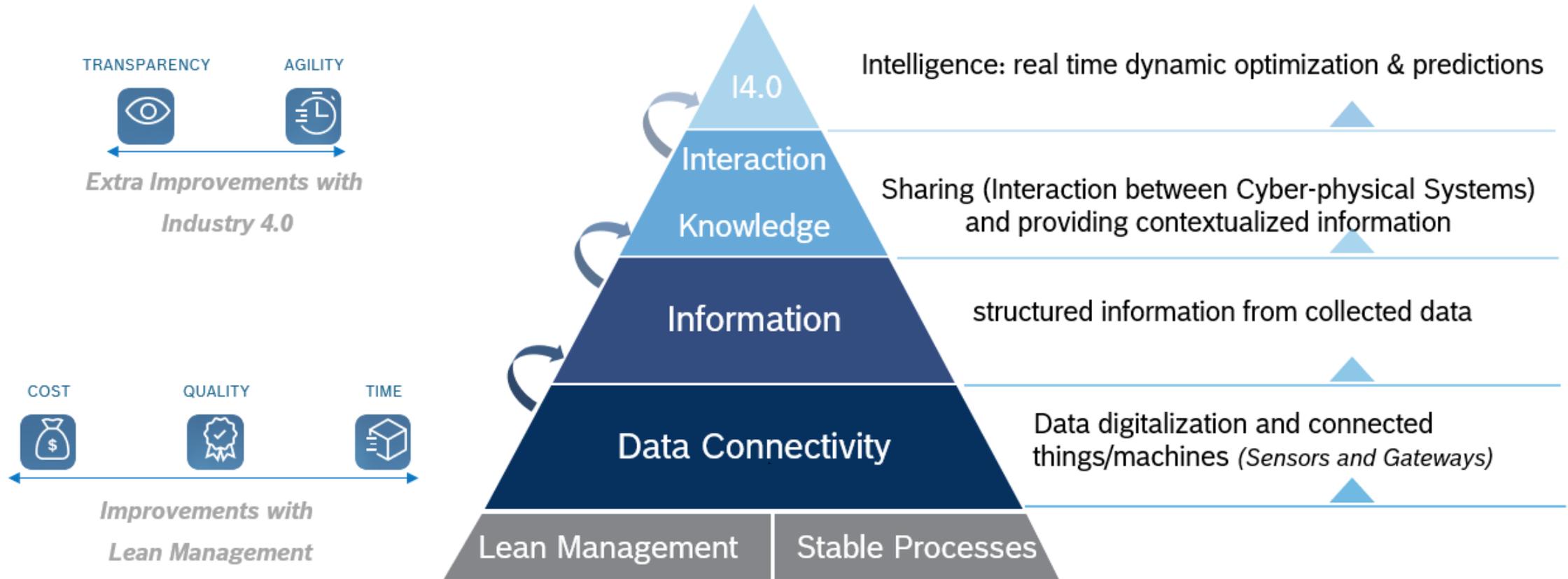


The Bosch 5C Layers of the Digital Transformation

Data Layers to understand the analytical models of Bosch



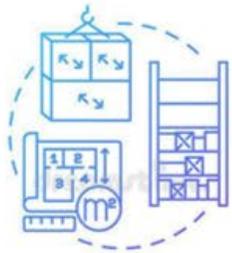
Industry 4.0, Factory of the Future & Benchmark 2025



Bosch Business Benefits



**12% – 20%
Reduction in
material
search time**



**5%– 8%
Reduction in
inventory level**



**5%– 7%
Improvement in
Productivity**



**3% to 8%
Improvement in
Process Control
and Quality**



**9%– 12%
Improve in
Throughput time**



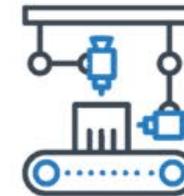
**Up to 7%
Improvement in
OEE Levels**



**Up to 100%
visibility &
Transparency**



**Up to 25%
Reduction in
Maintenance Cost**

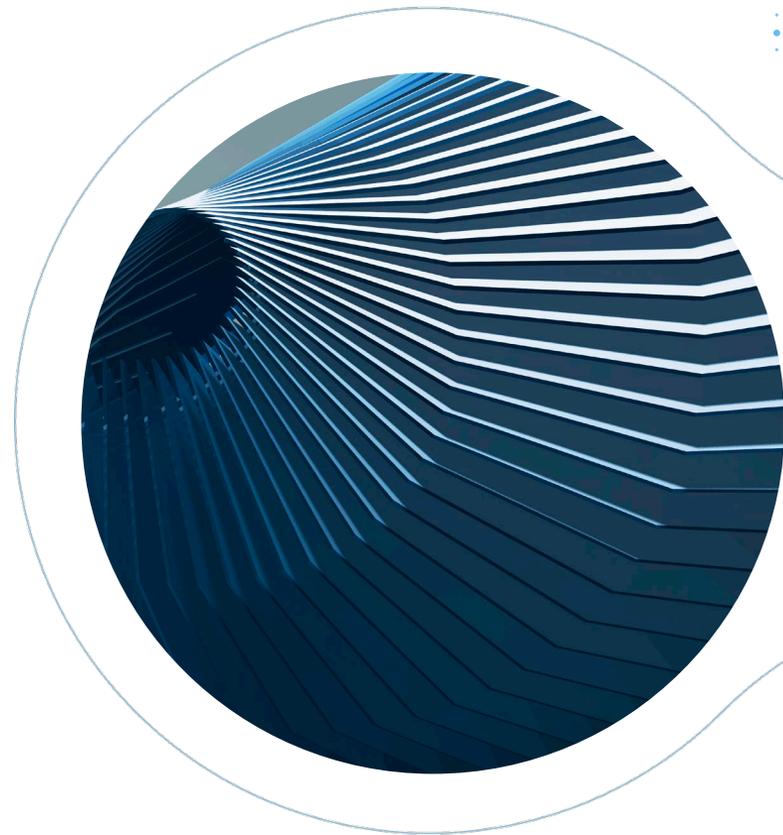


**Up to 15%
Increase in
Machine
Availability**



**7% to 10%
Improvement
in OTD**

Factory of the Future: Challenges





INTELLIGENCE **5**

INTERACTION **4**

KNOWLEDGE **3**

INFORMATION **2**

DIGITALIZATION AND CONNECTIVITY **1**



Mindset

Local Laws

**Standardized
Processes**

**Change
Management**

Connectivity

Unsafe
Situations

Lean
Management

Modular Platform
Architecture

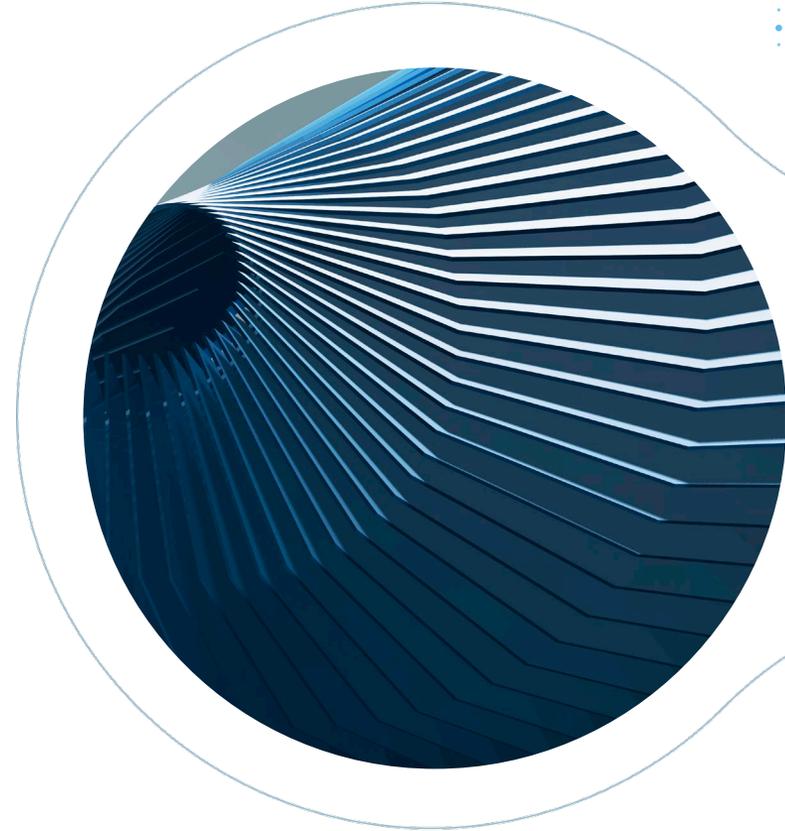
Standardized
Interfaces

OT Cybersecurity

Data Strategy &
Standards

Standardized
IT Systems

Use Cases: OT/IT Convergence



OT/IT Convergence

Problem

My shopfloor assets are not connected

Real Time data is not available from legacy shopfloor assets. Shop Floor to Top Floor integration is not available or not seamless.

Solution

Bosch DeviceBridge

Connects to wide variety of Machines supporting all major Industrial communication protocols. Smart and Flexible pre-processing layer to convert the raw data to readily usable format. Send the data seamlessly to various IT Applications

Result

Seamless OT – IT integration

Enabling Agility, Standardization, Transformation in Connect + Collect layer for I4.0 project success. Provides a foundation block for Industry 4.0 solutions - AI/ML, Data Analytics, etc.

OT/IT Convergence

Bridge the manufacturing enterprise with a wide variety of shop floor devices

DeviceBridge is an Industry 4.0 software product which can connect & collect process/machine related data seamlessly from wide variety of shop floor devices.

The acquired data can be transformed into various data formats and delivered to the upstream IT applications like MES, Database, File systems and Cloud.



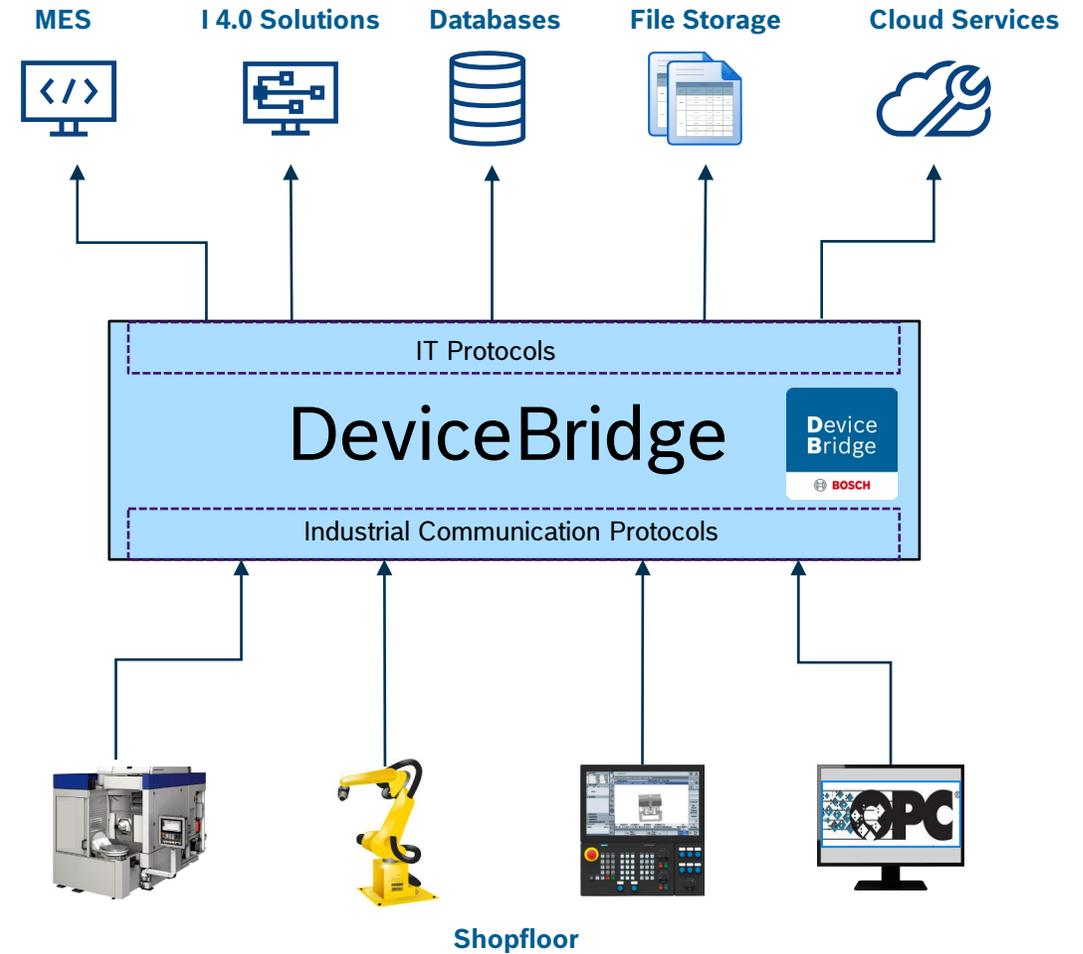
Real time data acquisition



Plug & play - Easy to configure & deploy

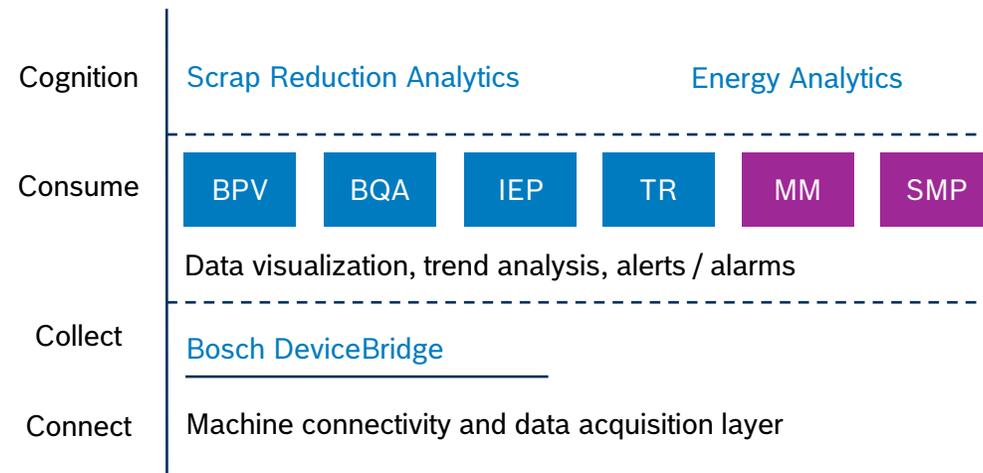


Quick addition of drivers for new devices



Customized Deployment of end-to-end IIoT solution

Customized and Modular Deployment of Custom II.0 at Client's Site



WHEEL MANUFACTURER Europa

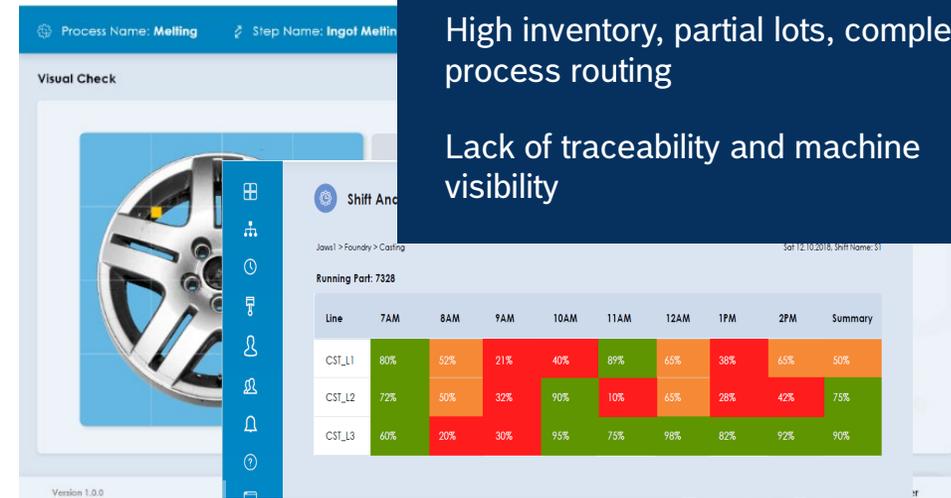
Capacity : 4.5M Wheels/annum
Traceability
Scrap & Rework reduction
Energy Analytics & Sensor Monitoring

CHALLENGES

High scrap rate, energy intensive processes and quality defects

High inventory, partial lots, complex process routing

Lack of traceability and machine visibility



OUTCOME

~\$ 2.5M USD

Estimated saving realized through implementation

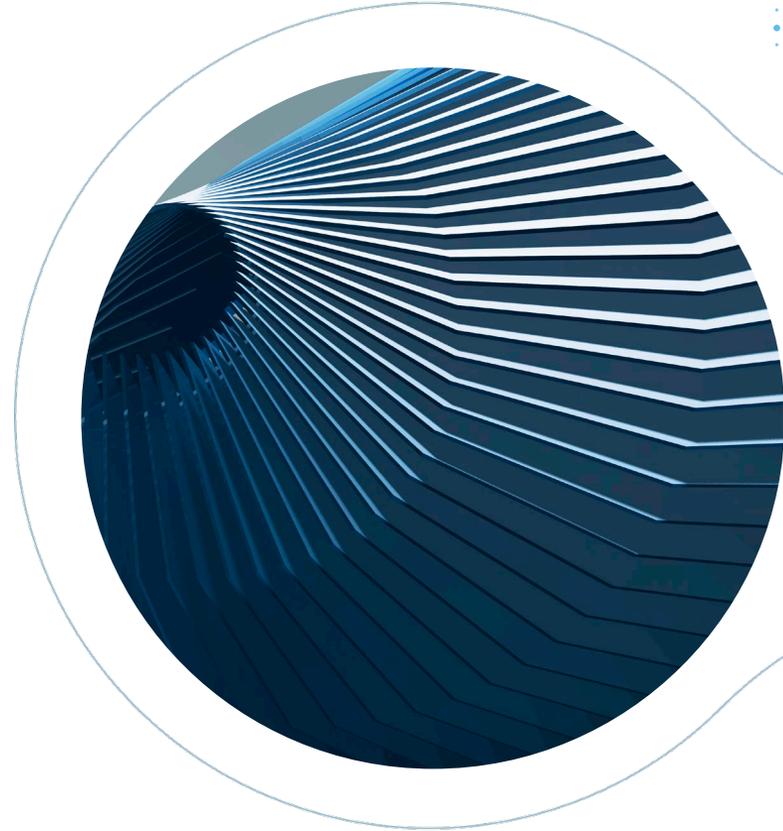
6% - 10%

Reduction in Scrap identified

10%

Improvement in conversion cost and manpower redeployment

Use Cases: Sustainability Insights with AI



Digital Suite targeted at Energy Conservation & Sustainability

- Full stack digitalization suite that **connects and monitors assets to optimize energy & utilities consumption** accelerating carbon neutrality initiatives
- 60+ pre-built KPIs for energy intensive production and utility assets
- Preconfigured asset models & templates for deeper insights
- Real-time analytics on Cloud or Edge (on premise)
- Facilitates ISO 50001 certification



Digitalize legacy machines and reduce new capital investments



Establish data and **KPI transparency** across sites 24X7



Library of Asset Models for **faster deployment**



Drive Energy/Utilities cost reduction



Key Benefits



Utility cost reduction



Efficient resource use



CO₂ footprint reduction



Utility conservation: Monitoring, management & optimization



Utilities



Process Machines



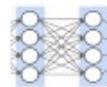
Power Sources



Power Distribution



Complex Assets



Cognitive layer
(Domain driven Analytics Models)

30+ Energy Intensive Asset Models

Water Balance

Leakage detection

Anomaly Detection

Forecasting



Consume layer
Energy + Utilities EnPI* & KRA Dashboards

Energy EnPIs as per ISO50001

Solar O&M

60+ Utilities KPIs

Assets Condition monitoring

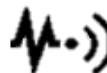


Collect layer + Edge Functions

Energy & Utilities IIOT gateway firmware

Class-1 Accuracy, CE,FCC, ATEX & EN69050 Compliance

Low latency Edge Functions: Condition Monitoring, alerting



Connect layer (SenseNet)

IEP SenseNet+ 30+ industrial Sensors



PLC/BMS/Energy meter



Sustainability transformation



5% to 20% energy cost reduction



Up to **20%** gain in utility management productivity



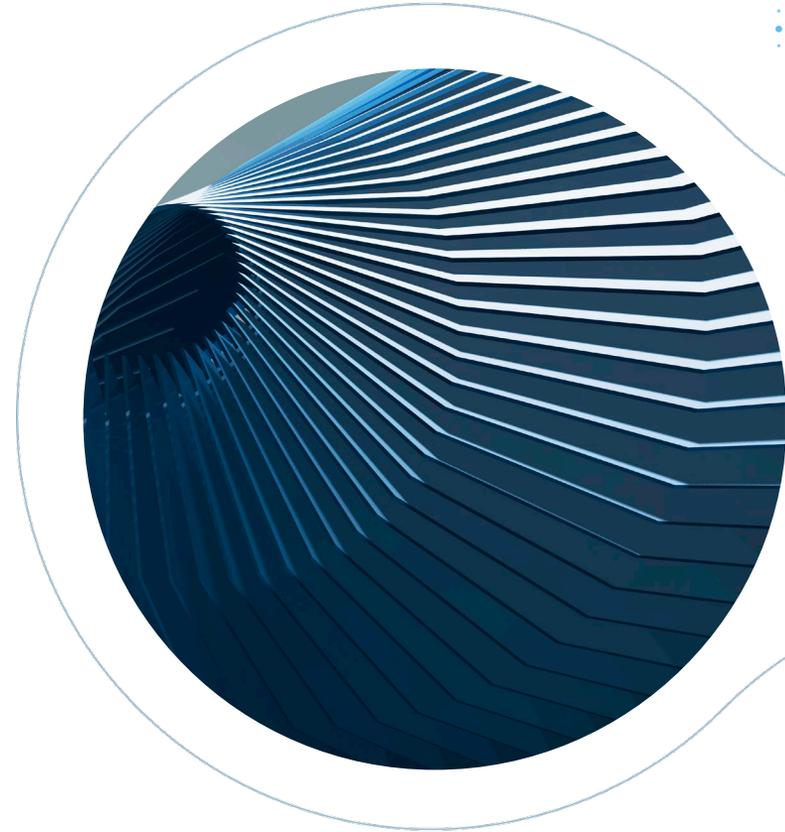
Up to **90%** reduction in utility management reaction time



Up to **30%** extension in tangible asset useful life management reaction time



Phantom: Jumpstart Sustainability with Smart Energy Management



Scope 2 Emissions Tracking, Productivity Improvement & Asset Monitoring



- AI @ Edge, IOT Gateway
- Real-Time Access **Anytime, Anywhere**
- **Non-Intrusive, 30 min** plug & play deployments
- Periodic **Insights** to Real-Time **Actions**
- **ONE** Cockpit. **24x7** Customer Support.

3 Use-Cases



Carbon Emissions Tracking from Facility Operations by measuring consumption of electric utilities & a Gateway to integrate water, gas, electricity & steam data



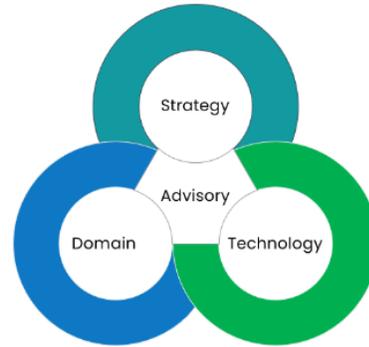
Productivity Measurement at Manufacturing Industries to reduce losses in a discrete manufacturing machine due to electrical, availability, performance and quality aspects



Asset Performance Monitoring
For equipment having high impact and close correlation to business operations

Digital Transformation: Industry 4.0 & Sustainability

Ihre Ansprechpartner



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