

SAP Industry 4.0 & the Internet of Things

Connected Manufacturing in Mill Products Industries

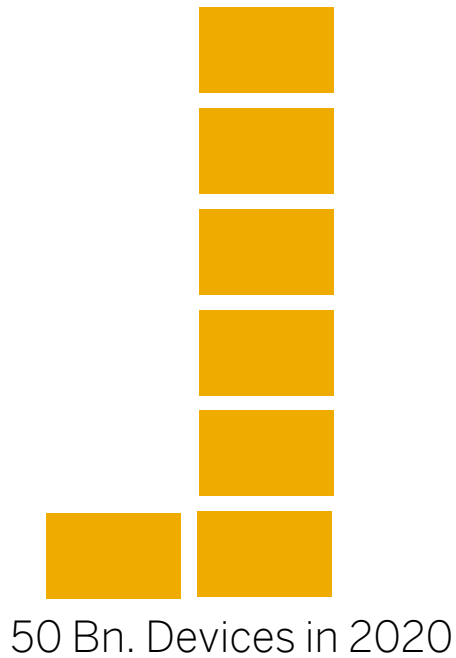
Chris Dorrow, May 2015

The SAP logo is located in the bottom left corner of the slide. It consists of the letters 'SAP' in a bold, white, sans-serif font, set against a blue rectangular background that is slightly tilted to the right. The background of the entire slide is a photograph of a steel mill, showing glowing orange molten metal being processed by machinery, with a metal staircase in the foreground on the left.

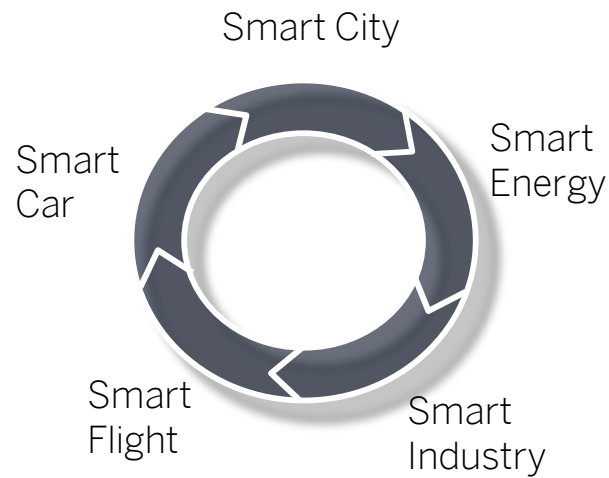
SAP

Trends in an Industrial World

Connected Devices



Connected Processes



Connected Business



Complexity

Manufacturing Continues to Change

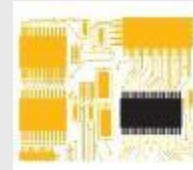
4th Industrial Revolution

based on cyber-physical systems



3rd Industrial Revolution

use of electronics and IT to automate the production



2nd Industrial Revolution

adoption of work-sharing mass production by using electrical power



1st Industrial Revolution

adoption of mechanical production facilities by using water and steam power



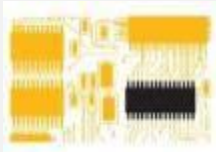
End of the
18th century

Beginning of
20th century

Early 70s

Today

Industry 4.0 – Terms and Enablers



M2M

Machine-to-Machine



Smart Anything

Devices provide Information



Cyber-Physical Systems

Machines connected to the business



Internet of Things

Connected via one protocol



Big Data & Analytics

Mass data & Semantics



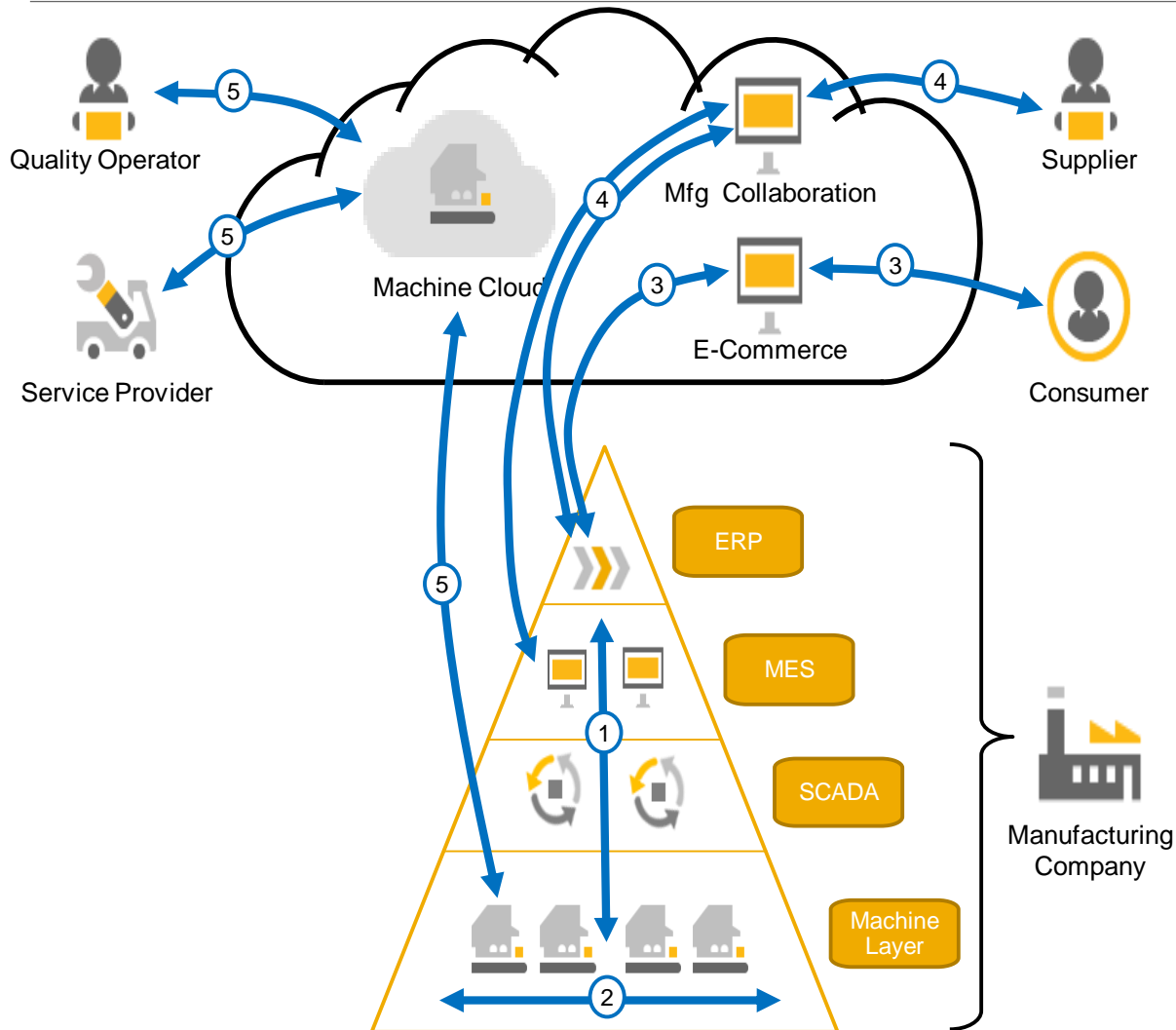
Mobile and Cloud

Access to Information anytime anywhere

Smart products, assets, and human beings in a hyper connected world

Connected Manufacturing

5 Scenarios of “Connectedness”

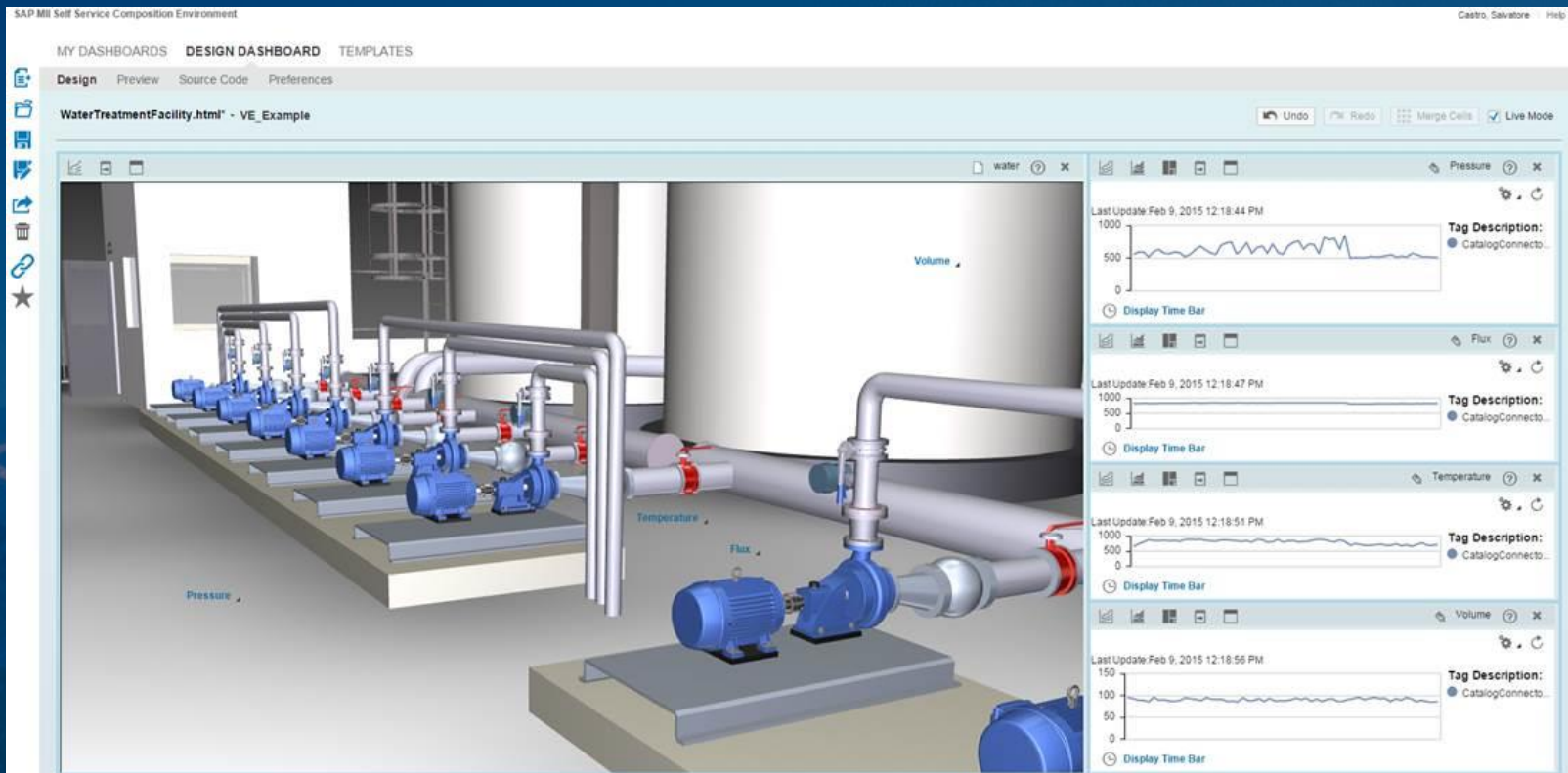


5 Scenarios:

- 1. Shop floor to Top floor**
Intra company vertical integration
- 2. Machine to Machine**
Autonomous machines
- 3. eCommerce Integration**
Direct integration of online configurators
- 4. Manufacturing Collaboration**
 - Visibility
 - Genealogy
 - Quality
 - Kanban / Direct replenishment
- 5. Machine Cloud**
 - Predictive maintenance
 - Predictive quality

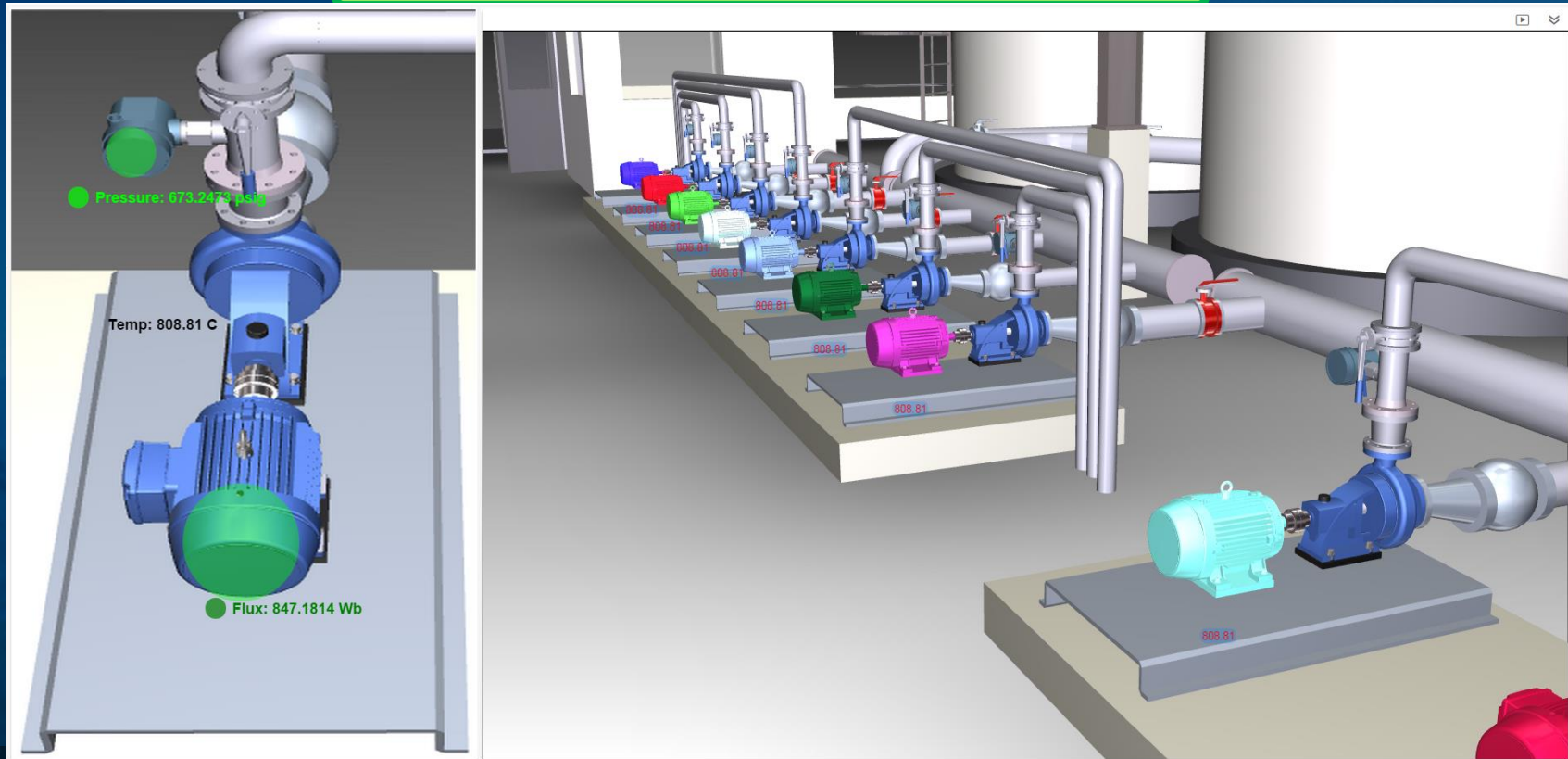
Next Generation Process Visibility – SAP MII & SAP Visual Enterprise

Currently In Development (Planned for MII 15.1 – Q4 2015/Q1 2016)



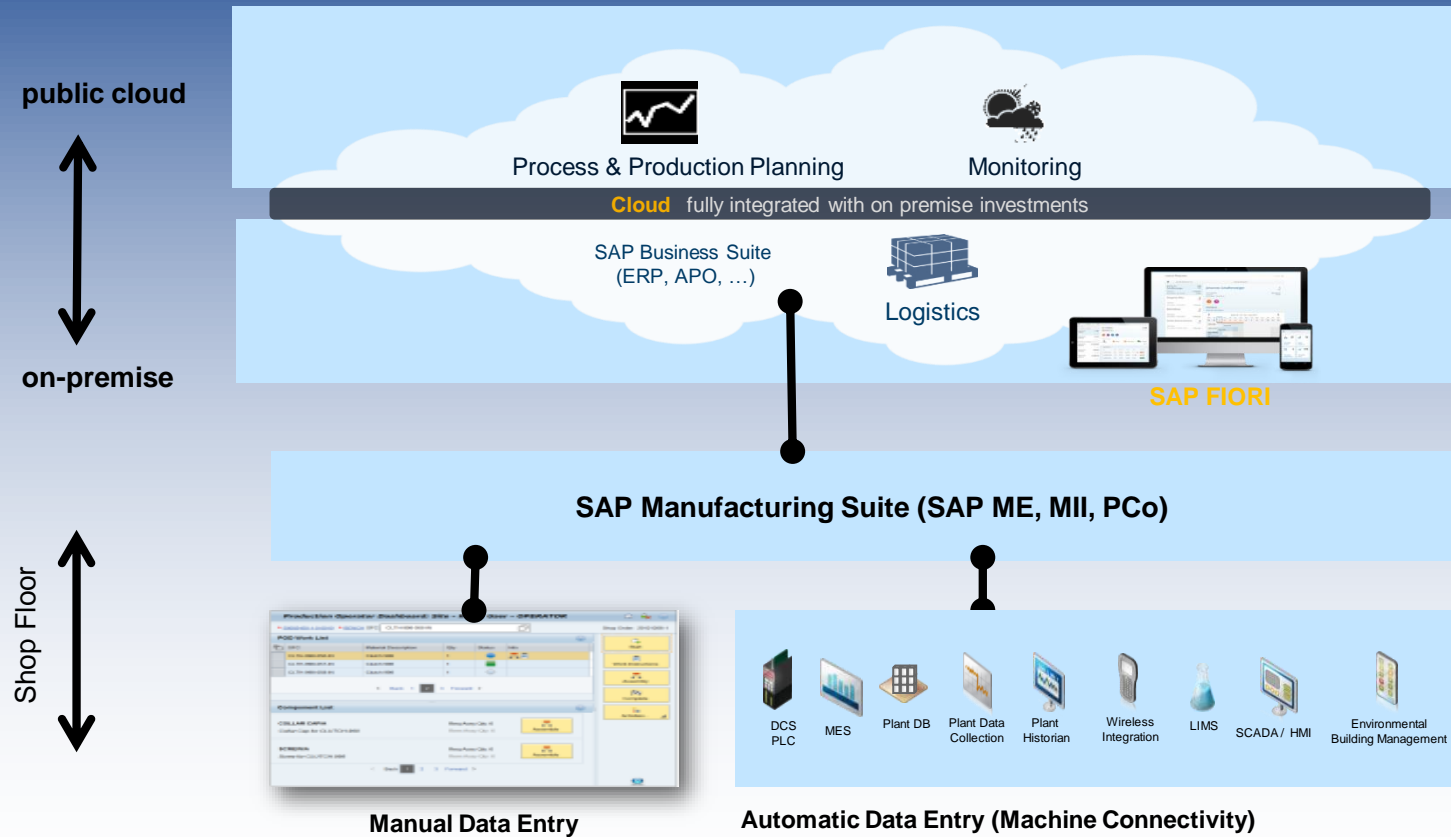
Connected Manufacturing: Manufacturing Data Across the Enterprise

Currently In Development (Planned for MII 15.1 – Q4 2015/Q1 2016)



SAP Connected Manufacturing

Cloud / On-Premise / Shop Floor



Powered by **SAP HANA**

Integration Architectures for Industry 4.0 & IoT Scenarios

Scenario	Connected Plant	Connected Assets	Connected Logistics	Connected Car
Application	Smart Plant with SAP Manufacturing Execution Suite (SAP ME, SAP MII, SAP PCo)	Predictive Maintenance & Service, Cloud Edition	Smart Logistics for Ports	Fleet Management
Connectivity	SAP PCo Shop floor connectivity	SAP IoT Connector Device Connectivity	Partner Solution Connectivity into truck on-board units	Partner Solution / SAP IoT Connector Device Connectivity
Platform	SAP HANA Platform for IoT (Optional *)	SAP HANA Platform for IoT Real time visibility, predictive, big data analysis, benchmarking ...		
Available Assets	SAP Manufacturing Execution Comprehensive Application Hundreds of live Customers	Custom Development Projects (Kaeser) Standard Product IoT (GEA)	Custom Development Projects	Custom Development Projects

Industrial Automation / Industry 4.0
 Internet of Things (IoT)



Prove Points in Manufacturing

Responsive Manufacturing

With SAP solutions, companies can develop real-time visibility into manufacturing operations, optimize manufacturing processes and asset performance, and collaborate in global manufacturing and supply chain networks while lowering costs and exceeding customer expectations. Companies can execute quality management processes to prevent deficiencies, enable continuous process improvements, and sustain quality control.

Design-to-order and project manufacturing



Offer custom-designed and engineered solutions for profitability and competitive differentiation.

Make-to-order manufacturing



Offer highly customized solutions with short lead times, on-time delivery, high quality, and low cost.

12%

Higher capacity

By aligning manufacturing objectives and operational activities*

Production execution and visibility including make to stock



Align and automate production execution activities for continuous monitoring and control.

Quality management and compliance



Exceed expectations for quality management and compliance.

17%

Higher return on assets

Where asset management systems are fully integrated*

Asset operations and maintenance



Ensure assets stay up and running with effective maintenance planning, scheduling, and dispatching.

SAP solutions enable building products companies to maximize return on assets and create custom products through:

- Enhanced productivity and reduced manufacturing costs
- Reliable and compliant products by managing lifecycle quality levels

- ▶ [Bruynzeel Keukens](#)
- ▶ [Joris Ide Group](#)
- ▶ [Wienerberger](#)
- ▶ [HBIS Tangshan Iron and Steel](#)

SAP solutions provide streamlined processes for a variety of industry value chains by integrating horizontal lines of business with industry-specific solutions on premise, in the cloud, and through mobile devices.

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Use Case Scenarios in Metal

Metal industry

Use case cold rolling mill

Description

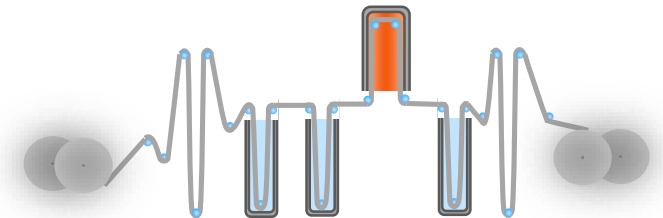
Starting of coating line leads to losses during calibration phase.

Potential

Shortening of calibration phase reduces losses and so costs.

Solution approaches

- Real-time analysis of BIG DATA
- Analysis of historic data with predictive methods to improve real-time analysis
- Integrated analysis of data of different machines



Metal industry

Use case product quality

Description

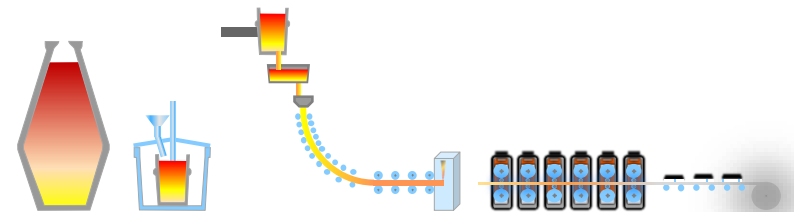
Cost pressure leads to operation of machines at “lower limit” with ongoing reduction of safety tolerances.

Potential

As more precise the machines can be operated as lower the danger of quality issues and to run into related product depreciations.

Solution approaches

- Real-time analysis of BIG DATA
- Usage of predictive methods for maintenance
- Integrated analysis of data of different machines



Metal industry

Use case creation and operation of production assets

Description

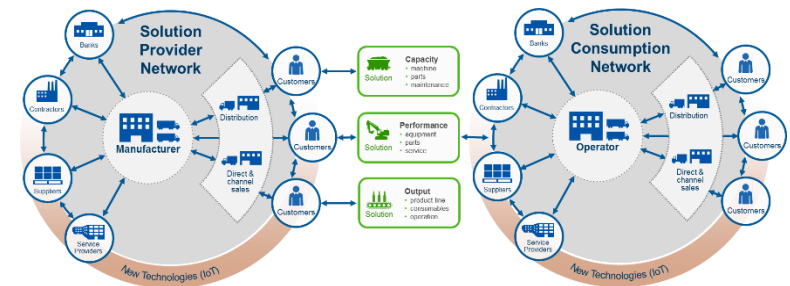
Metal companies often operate machines of different manufacturers resulting in many different processes and machine data formats for interaction.

Potential

An aligned approach of asset manufacturers and operators can lead to improved processes and lower costs.

Solution approaches

- Harmonized definition of data and processes
- Need distribution of “business tasks”
- New business models



Metal industry

Use case customer service by real-time

Description

Customers expect high quality, low costs and reliable information at increasing lower time horizons for order, last changes and deliveries (“Amazon for Steel”)

Potential

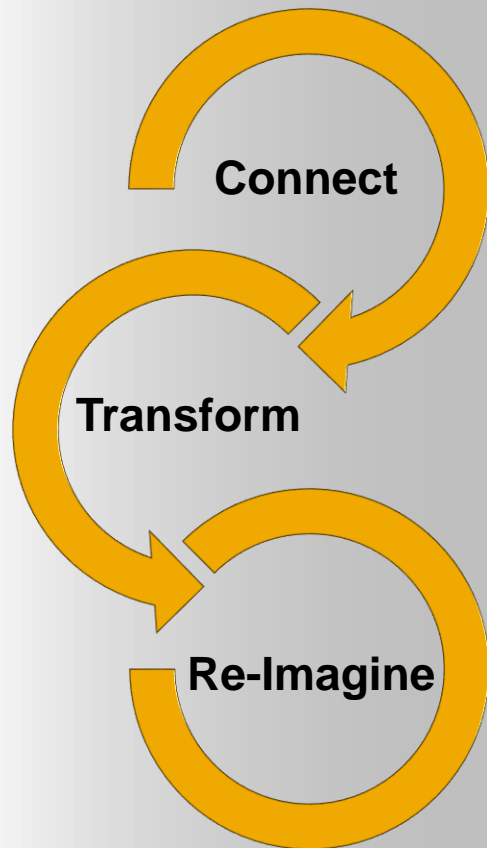
A seamless connection and usage of data in sales, procurement through production up to delivery is the base for competitive advantages.

Solution approaches

- Harmonized definition of data and processes
- Handling of real-time data
- New business models



Internet of Things in Manufacturing Will...



Improve your products and services by adding “cyber capabilities”

Take advantage of Industrie 4.0 technologies to improve your own processes

Enable new business models for yourself and your customers

Questions?



Industrie 4.0



Internet of Things