



Dare più valore alla misura:
integrazione tra metrologia e l'ecosistema informativo aziendale.



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Global Trends

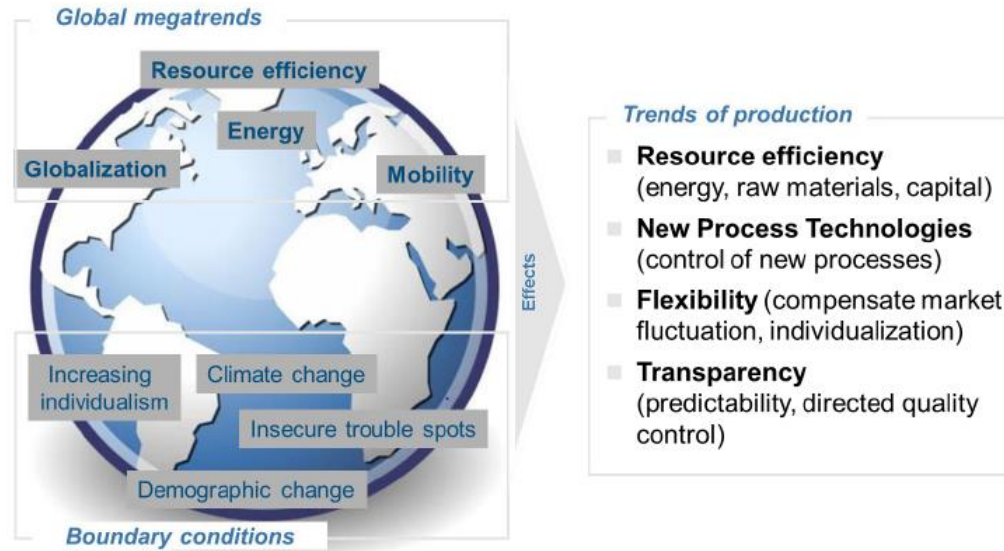


Figure 1. Global trends and trends in manufacturing technology (image source: WZL, RWTH Aachen).

Challenges and trends in manufacturing metrology – VDI/VDE Roadmap

Cyber Physical Production System (CPPS)

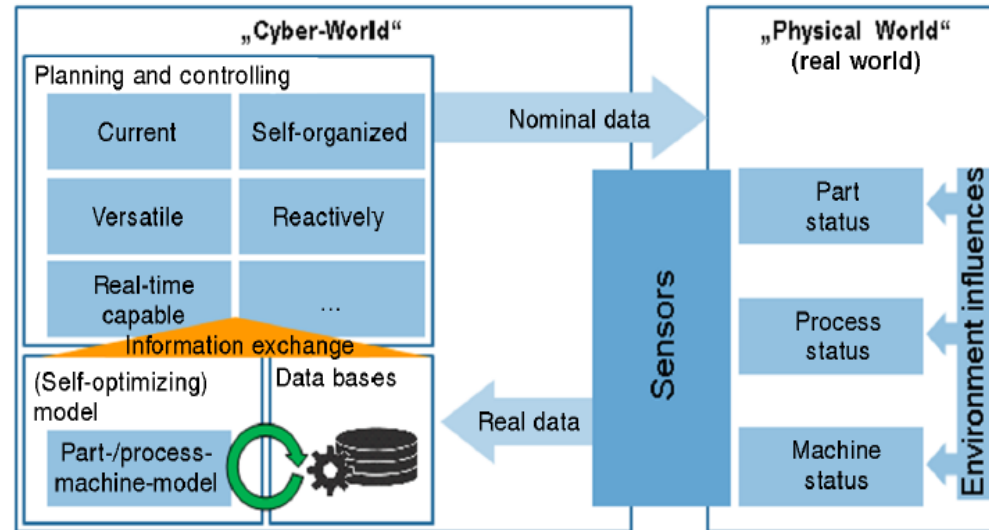


Figure 2. Concept of a cyber-physical production system.

Challenges and trends in manufacturing measurement technology – the “Industrie 4.0” concept

Manufacturing Metrology

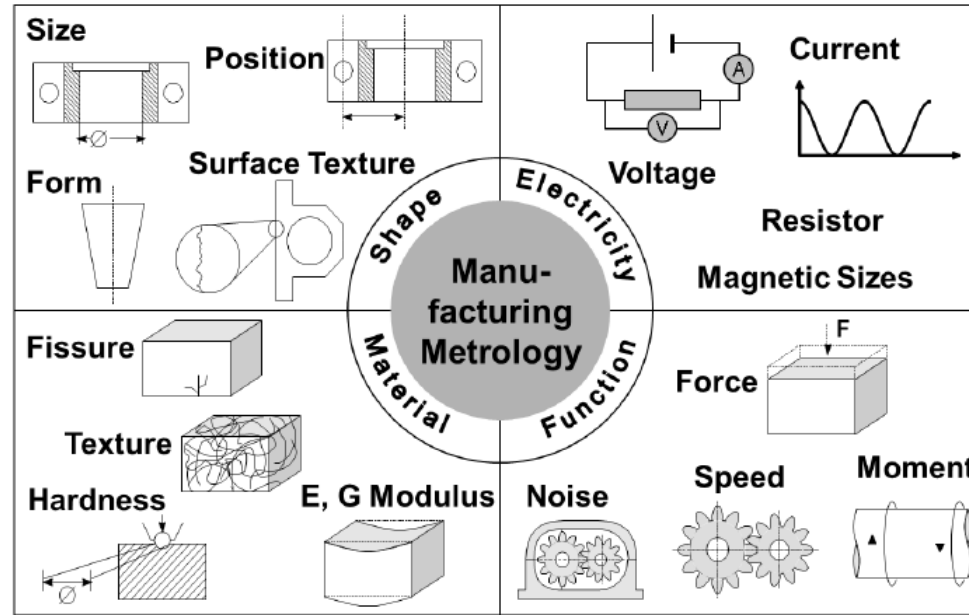
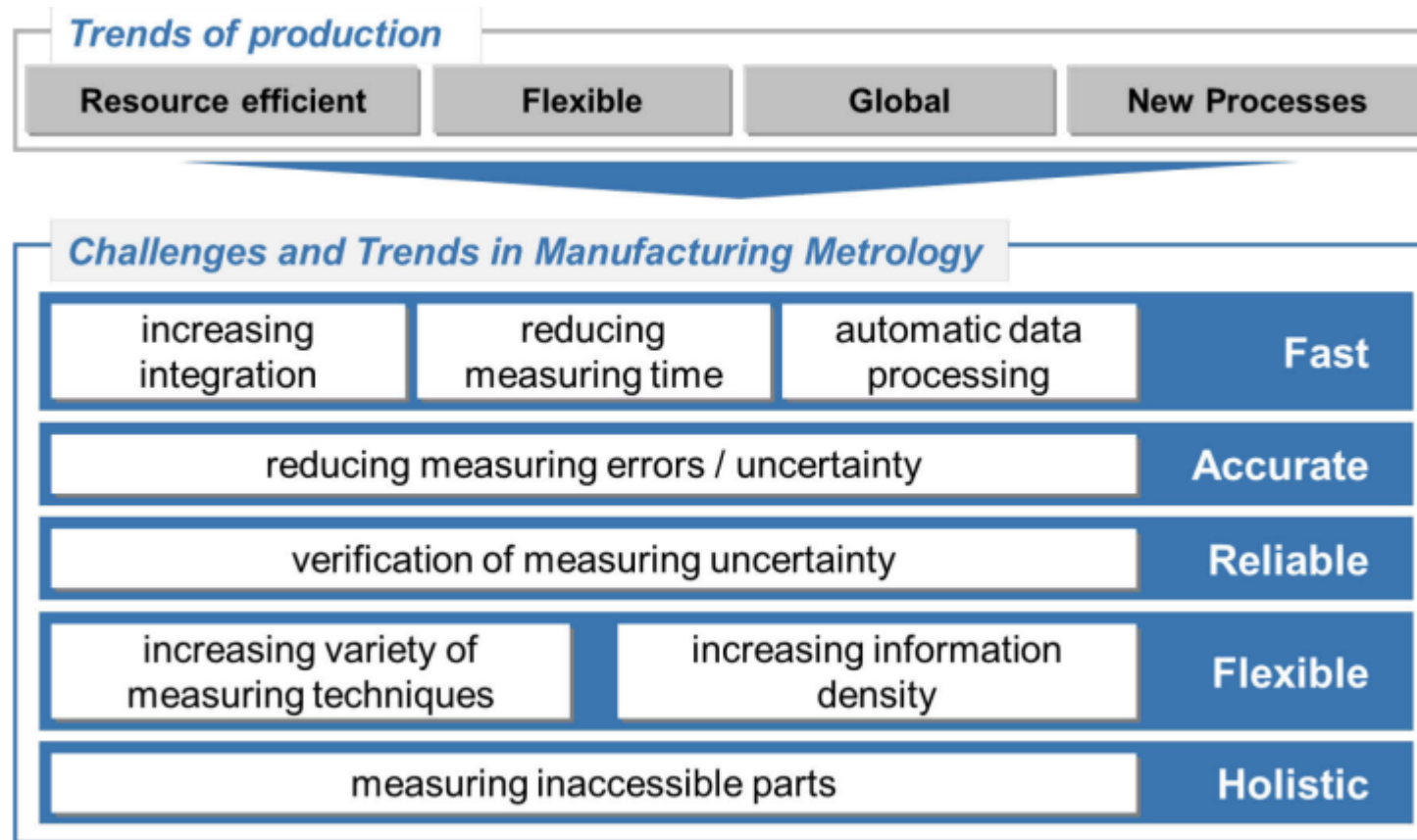


Figure 2. Fields of application for manufacturing metrology (derived from Pfeifer and Schmitt, 2010).

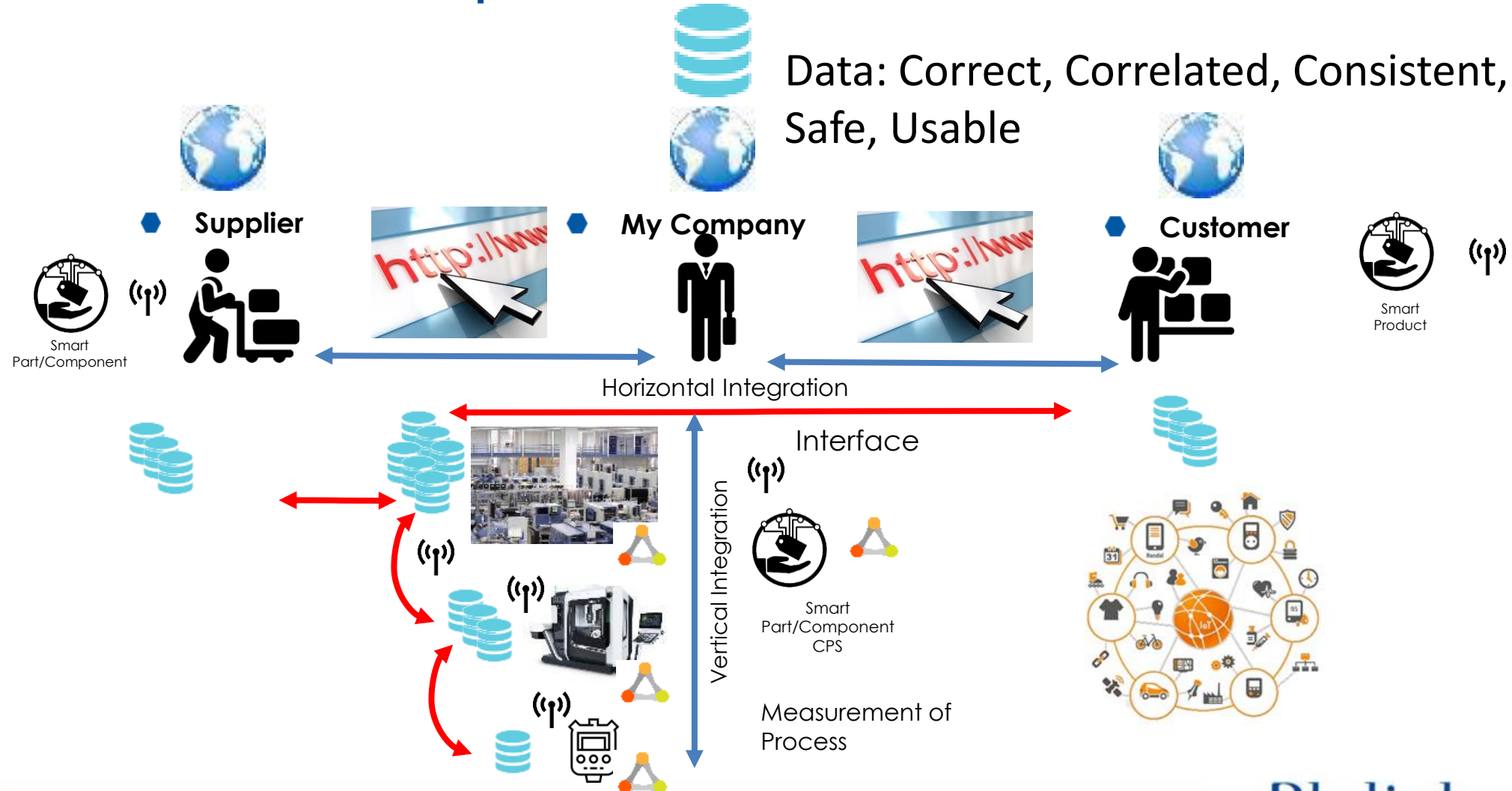
Looking at the future of manufacturing metrology: roadmap document of the German VDI/VDE Society for Measurement and Automatic Control

Metrologic Requirements and Trends



Requirements and trends from the VDI 2020 Manufacturing Metrology Roadmap (updated in 2015)

Trend: Competences, Complexity, Data, Technology – Speed and Growth



QMIS as a Gateway

- Machine Learning (ML) – BIG DATA
- Enterprise Information System (ERP, MES, ...)
- Cloud Platform

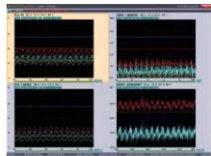


Gateway

Data Collection Network



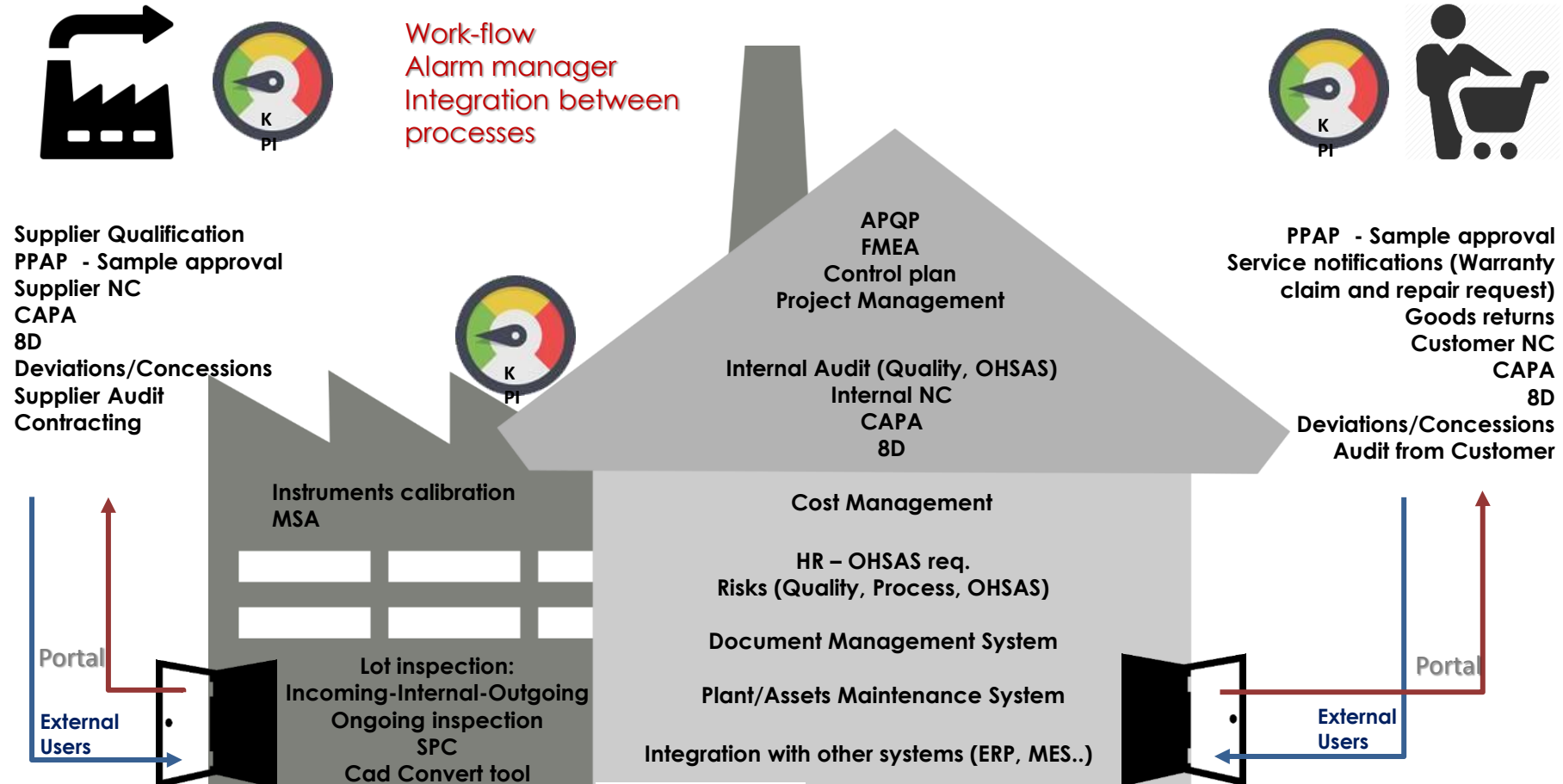
DDU non-contact sensor system with stator and rotor directly on the tool holder



devit is the best method for monitoring long duration machining jobs on a single workspace

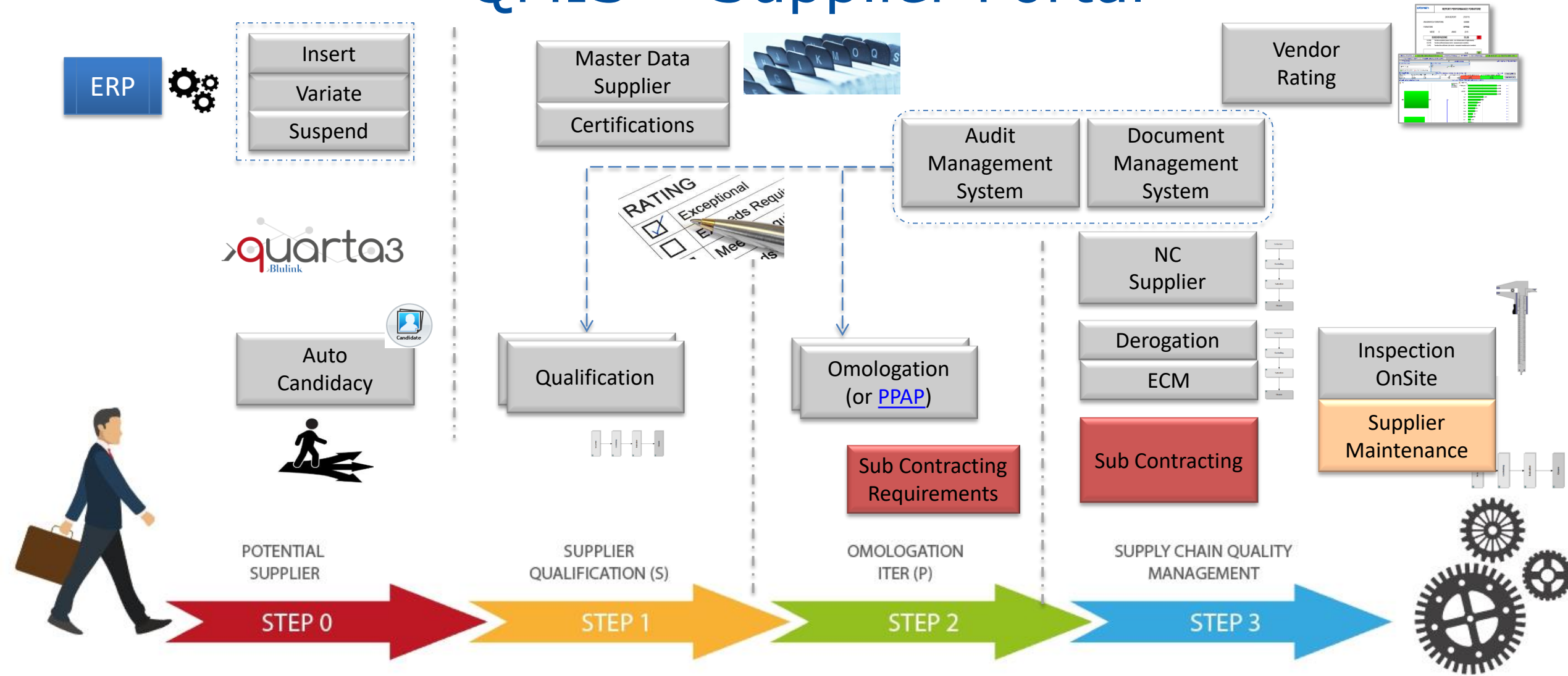


QMIS – Functions



quarta3

QMIS – Supplier Portal



The Flow



Part Nr. PART001

INCOMING

Part Nr - Supplier

PRODUCTION

Part Nr - Operation

SPECIAL ACTIONS

Part Nr - Operation

- Hourly controls
- Change Shift controls
- Change setup controls
- Change tools controls
-

Outgoing

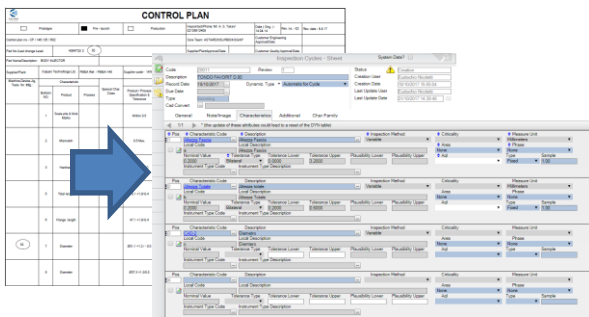
Incoming Inspection Module

Internal Inspection Module

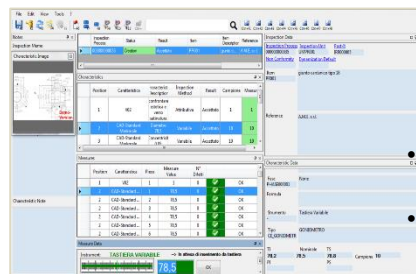
On going Inspection Module/SPC

Outgoing

Incoming Inspection Cycle

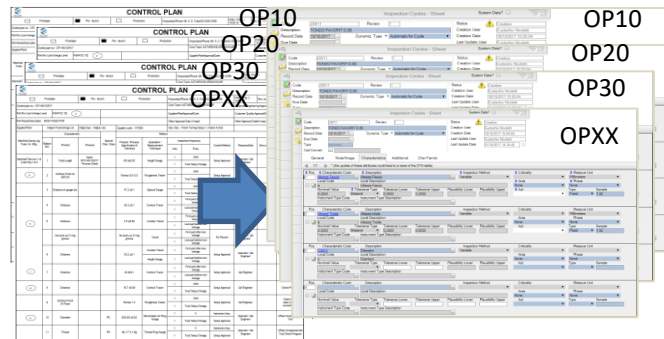


Incoming Inspection Control process

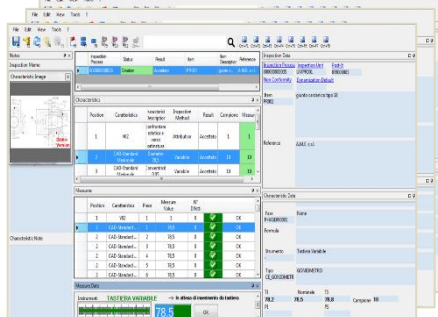


- Characteristics Values
- Serial Numbers

Internal Inspection Cycle

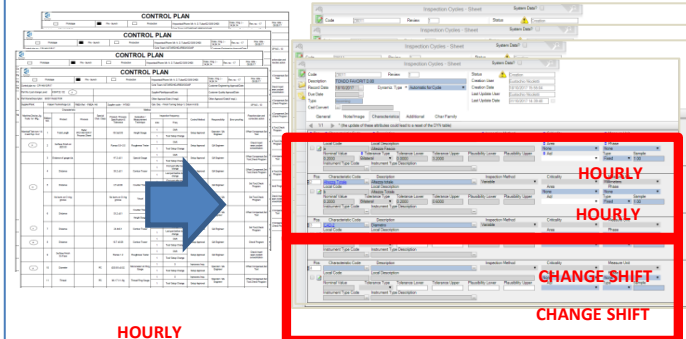


Internal Inspection Control process

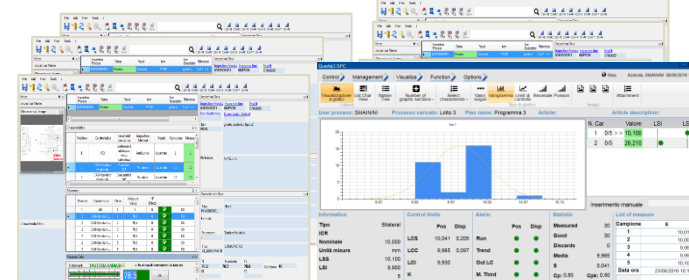


- Characteristics Values
- Serial Numbers

On going Inspection Cycle / SPC

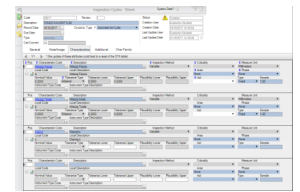


On going Inspection Control process

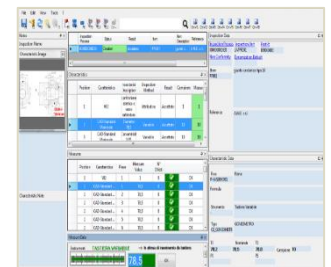


- Characteristics Values
- NO Serial Numbers

Outgoing Inspection Cycle

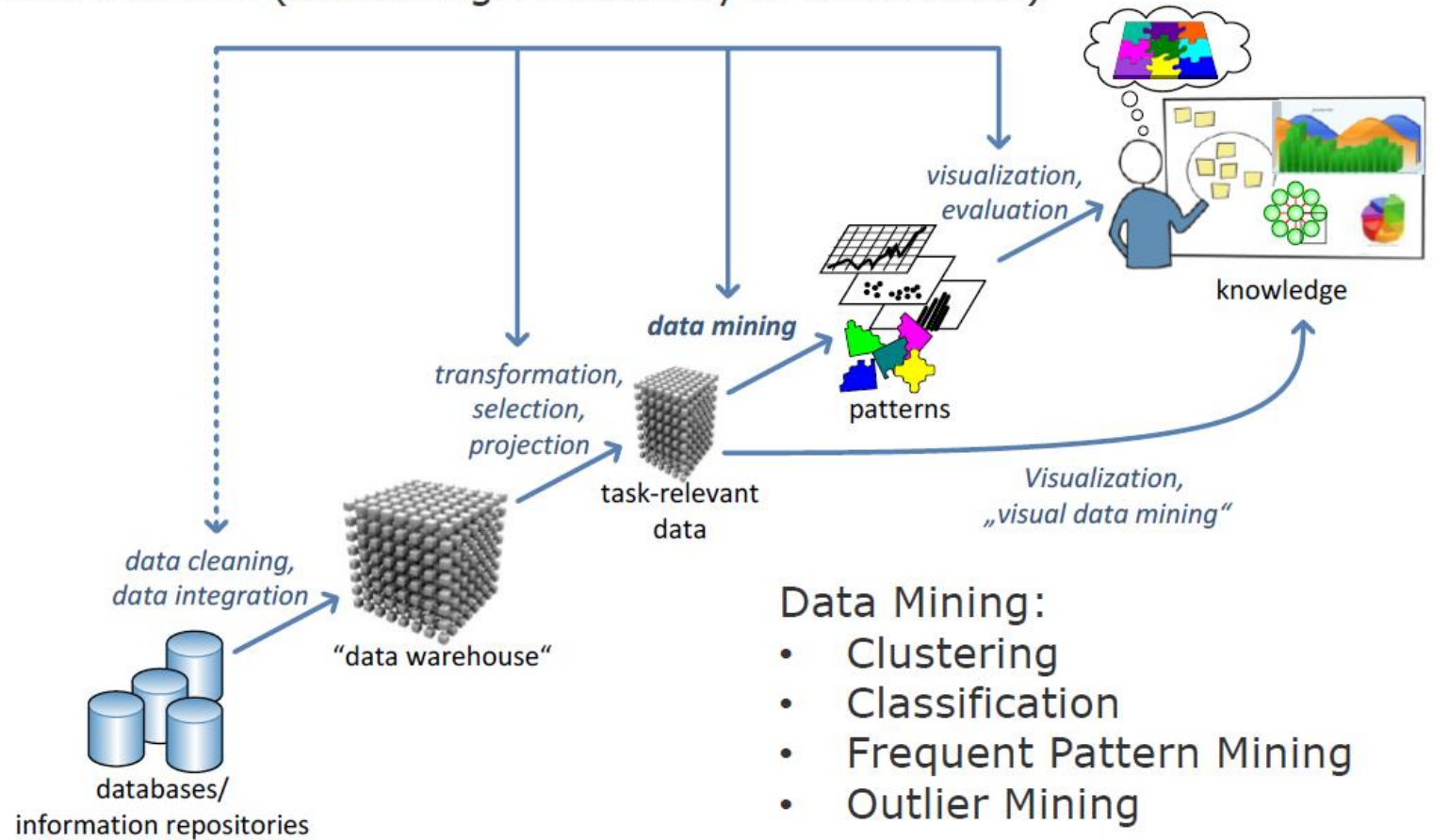


OutgoingControl process



KDD – Knowledge Discovery in database

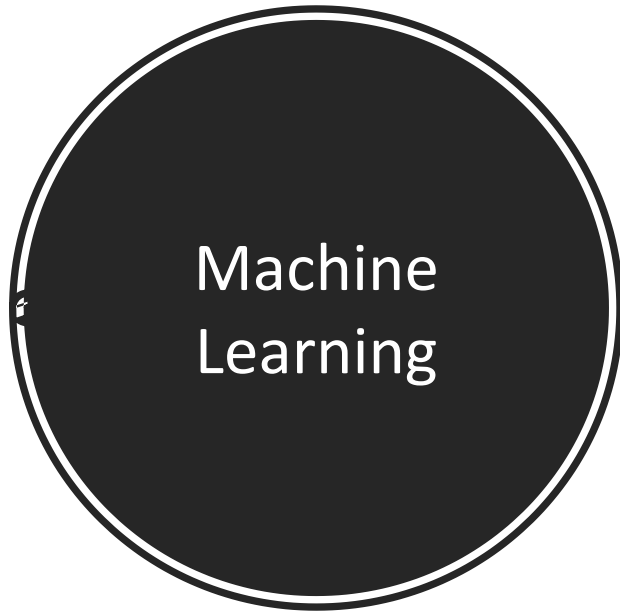
KDD-Process (Knowledge Discovery in Databases)



Difference - Unsupervised / Supervised learning?

Clustering: Unsupervised learning

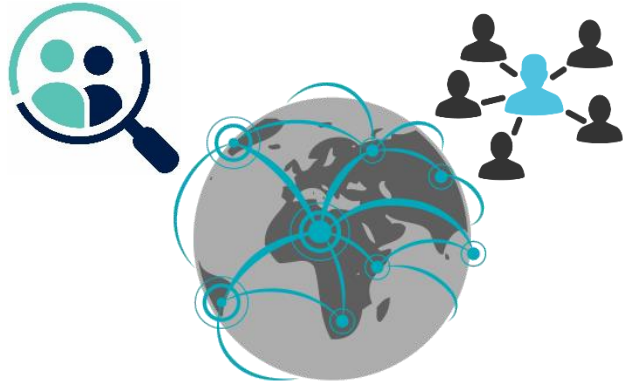
- The class labels of training data are unknown
- Given a set of measurements, observations etc. with the aim of establishing the existence of classes or clusters in the data.
 - Classes (=Clusters are unknown)
 - You don't know what you are looking for



Classification: Supervised learning

- Supervision: The training data (observations, measurements etc) are accompanied by labels the class of the observation
 - Classes are known in advance
 - you know what you are looking for
- New data is classified based on the information extracted from the training set





INTERNATIONALIZATION



INTEGRATION QUARTA3 & MARPOSS MEASURING INSTRUMENTS



NEW SKILLS



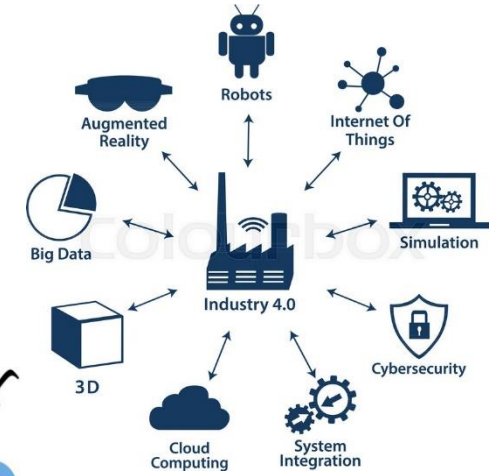
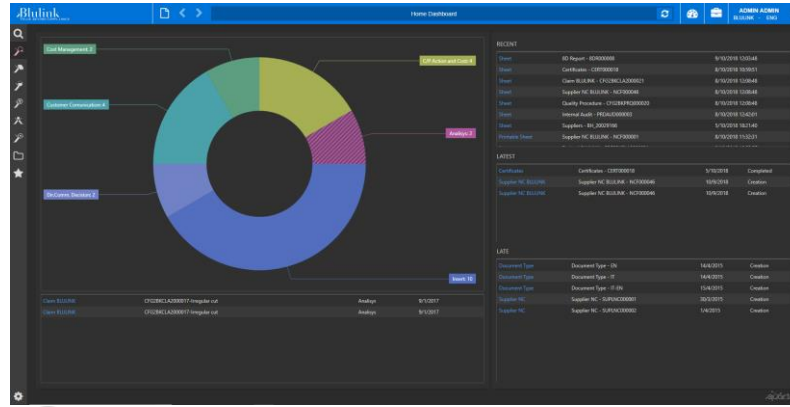
**Measurement and
EDGE Technology**
for Blulink

**Information Technology
and data analysis for
Marposs**

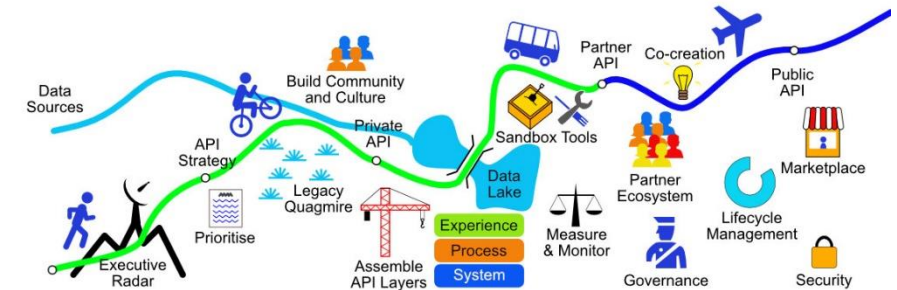
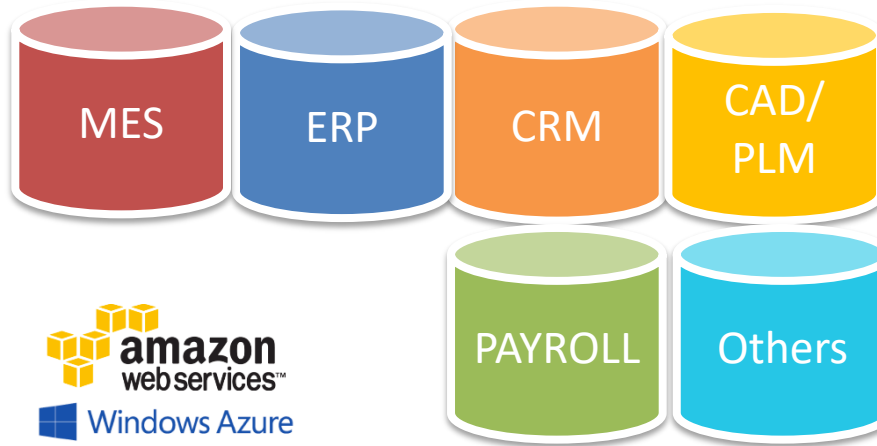


QUALITY 4.0 / INDUSTRY 4.0

Quality & Safety Platform



BEST *of*
BREED



Thanks for your attention



Bernhard Konzet CEO

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