

The background of the slide is a dark blue image showing a man and a woman in business attire. They are interacting with a futuristic, semi-transparent interface that includes concentric circles and a world map. The woman is pointing at a circular element on the interface.

TRACK & TRACE (SHOPFLOOR CONTROL SYSTEMS)

SLF
SERVICE LOGISTICS FORUM

PERSONAL INTRODUCTION



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VINCI ENERGIES: A BRAND STRATEGY PER ACTIVITY



INFRASTRUCTURE



INDUSTRY



SERVICES



ICT



51 COUNTRIES
OF WHICH **30** OUTSIDE
EUROPE



€10.2Billion
REVENUE IN 2015



1,600 BUSINESS UNITS
65,400 EMPLOYEES

OUR STRENGTH: THE POWER OF A WORLDWIDE NETWORK



40 COUNTRIES

5 CONTINENTS



319
BUSINESS UNITS

**Shared vision and
values**

ACCELERATOR OF OPERATIONAL INNOVATIONS



SMART PROCESS / MANUFACTURING

Produce in a **human-centered** and **connected** industry

- ✦ MES / traceability
- ✦ Cobotics
- ✦ Quality control & Vision
- ✦ Smart Logistics
- ✦ Non-Destructive Testing
- ✦ Additive manufacturing
- ✦ Virtual reality / 3D Modeling



SMART ENERGY

Accelerate the energy transition for a **sustainable** and **responsible** industry

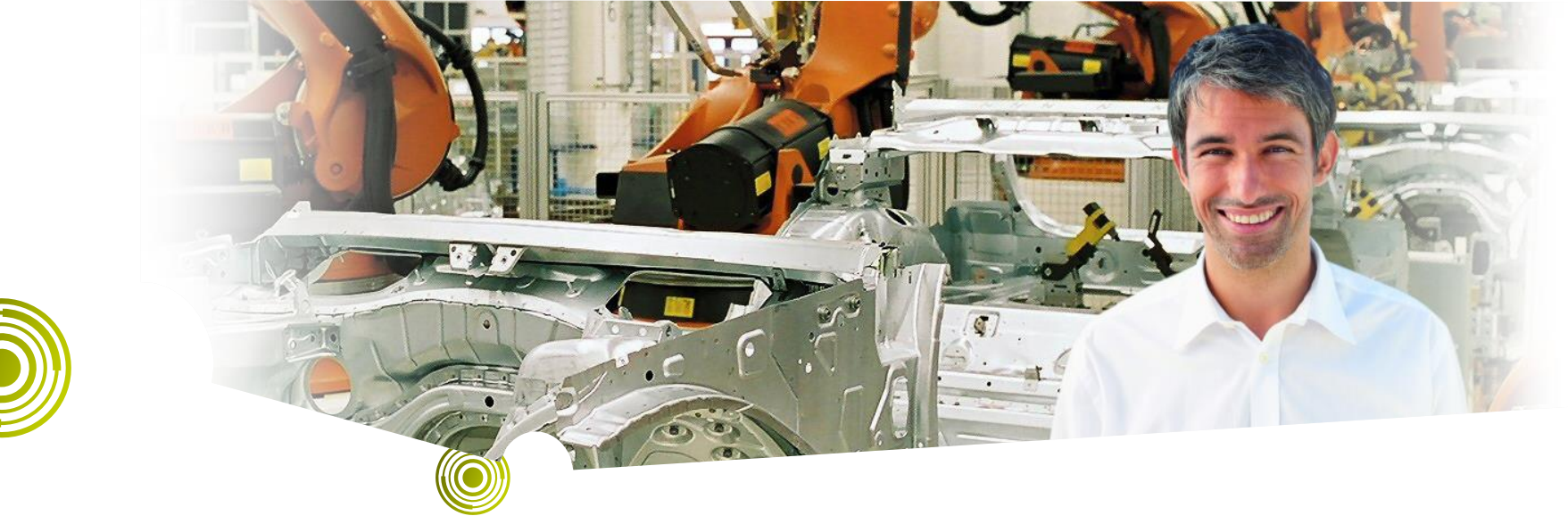
- ✦ Audit and Systemic Analysis
- ✦ Energy Monitoring
- ✦ Energy Optimisation
- ✦ Demand-Response
- ✦ Advice and Financing Solutions



SMART MAINTENANCE

Manage production assets for an **efficient** and **optimized** industry

- ✦ Augmented reality
- ✦ Mobility tools
- ✦ Predictive maintenance
- ✦ Internet of things



TRACK & TRACE

Shopfloor control / Manufacturing Operations Management

IDENTIFICATION TECHNOLOGY



Manual Entry
(Entry per item)



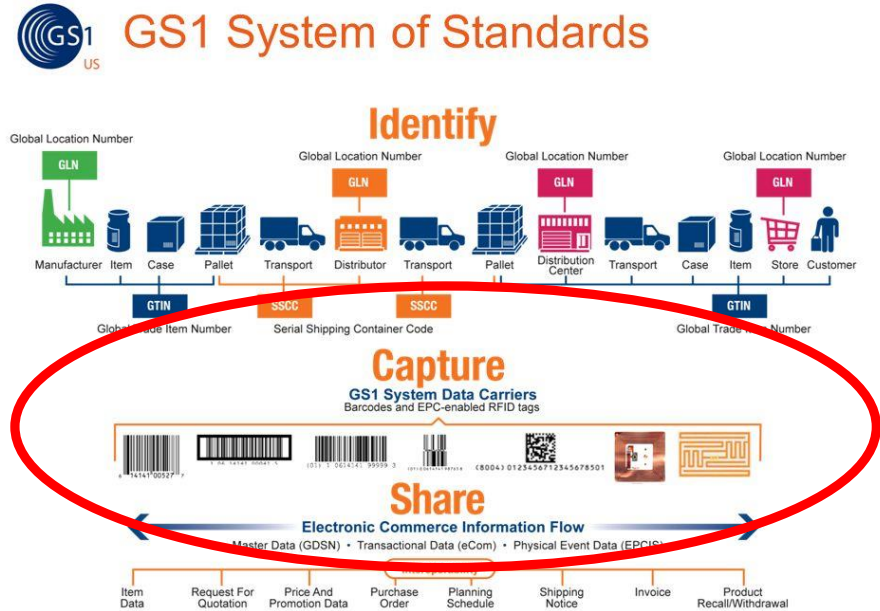
Barcode
(Scan per item)



RFID
(Automatic scan of single or multiple items, contactless)

WHAT MAKES RFID SMART?

- **RFID is a way of identifying your components/items, used by operations to:**
 - Track items/components and order progress
 - Trace items
- **Business/IT systems adds the logic to support smart operations**
 - Vertical integration
 - Shopfloor control / Manufacturing operation management systems
 - From RFID to information (contextualization)



SHOPFLOOR / MANUFACTURING OPERATIONS

Characteristics of manufacturing operations (for service components):

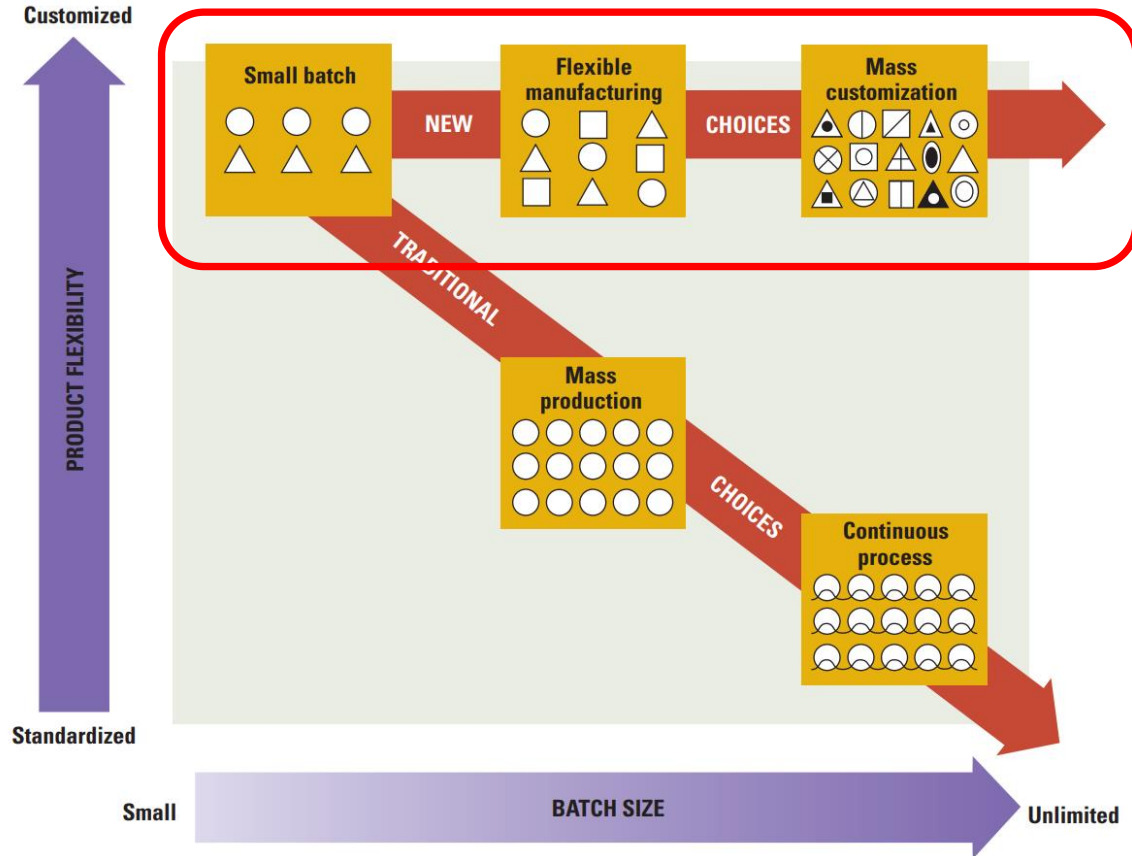
- ✦ Flexible routings of components / flexible operations scheduling
 - ↳ Routing based on the state of the received component(s)
- ✦ Inspections (incoming goods / outgoing goods)
- ✦ (Many) different work-instructions
- ✦ Tracking / Traceability
- ✦ Nonconformity handling
- ✦ Skilled / Certified personnel

Fokker Services



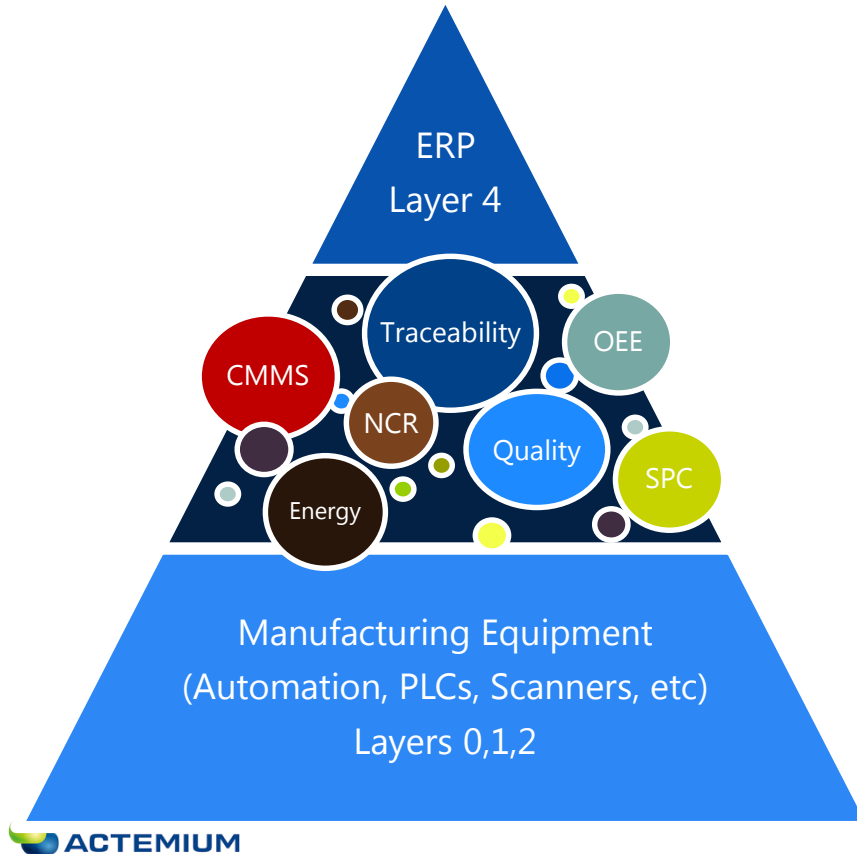
- Lessor Aircraft Redelivery
- Operator Aircraft MRO
- VIP Aircraft Conversions
- Component Programs
- Component Repair
- Spares Availability
- Engineering Services
- Aircraft Modifications
- Defense

FLEXIBLE MANUFACTURING SYSTEMS



Source: Based on Jack Meredith, "The Strategic Advantages of New Manufacturing Technologies for Small Firms," Strategic Management Journal 8 (1987), 249–258; Paul Adler, "Managing Flexible Automation," California Management Review (Spring 1988), 34–56; and Otis Port, "Custom-made Direct from the Plant," BusinessWeek/21st Century Capitalism (November 18, 1994), 158–159.

USUALLY SHOPFLOOR SYSTEMS ARE FRAGMENTED...



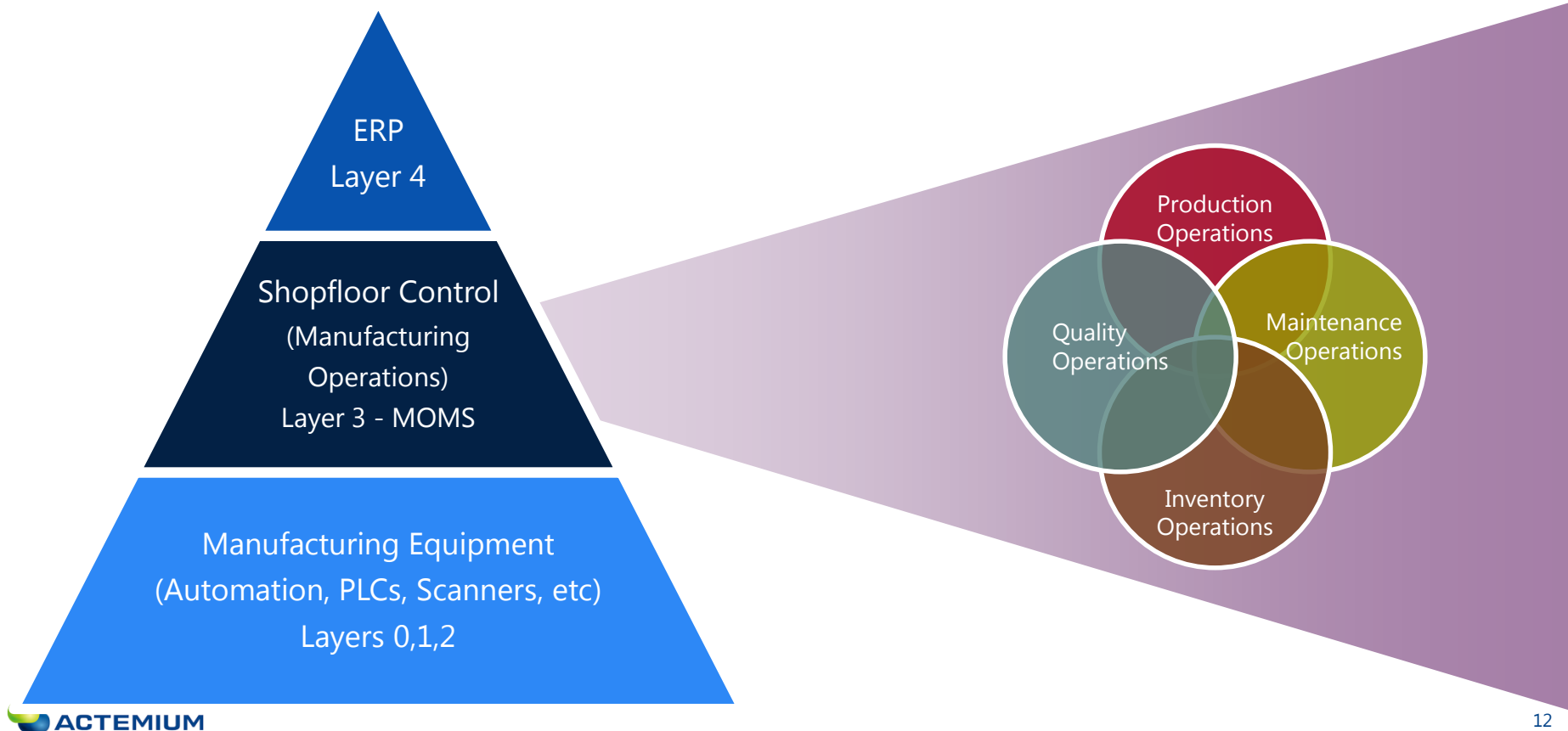
Level 3:

- ✦ Departmental
- ✦ Spreadsheets
- ✦ Paper
- ✦ Home grown applications
- ✦ Access databases
- ✦ 3rd party Applications

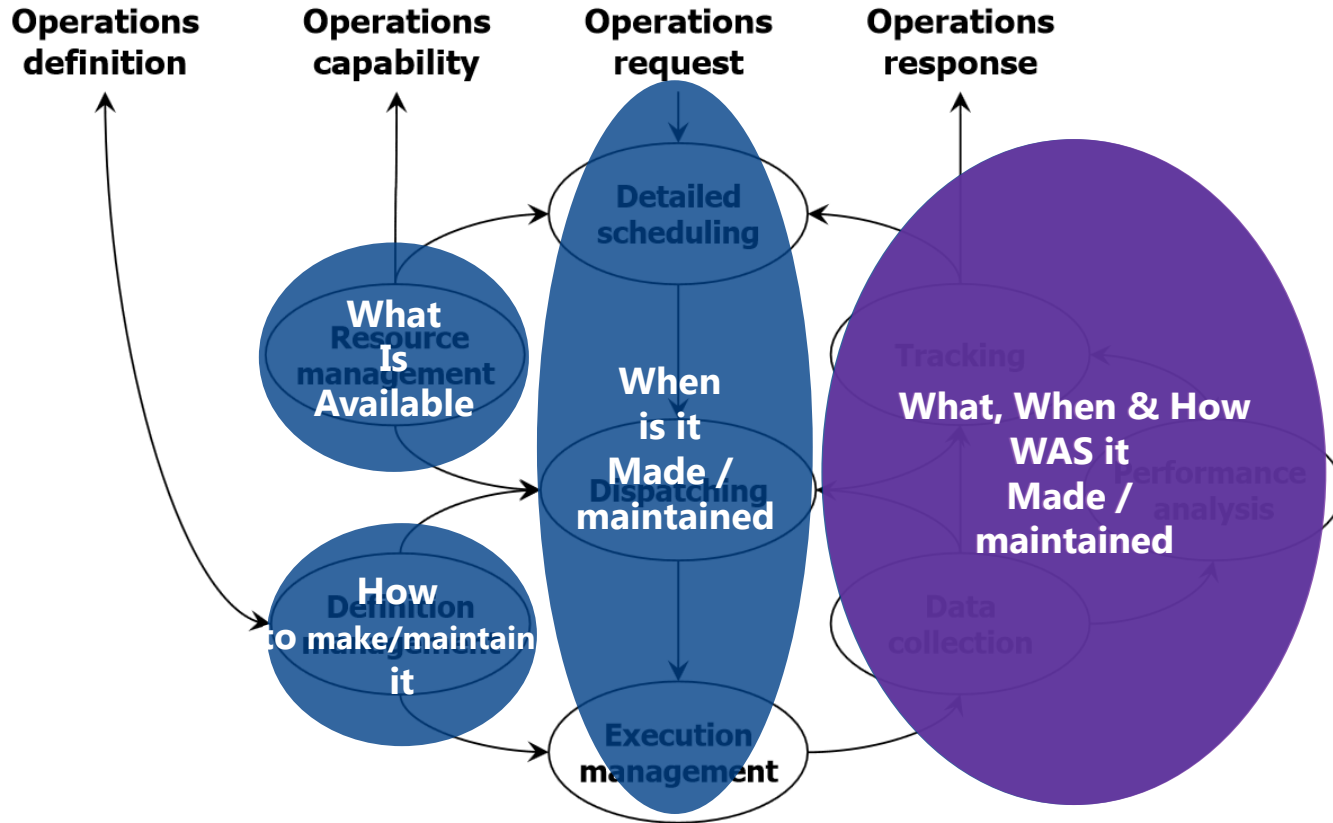
Not:

- ✦ Shared
- ✦ Visible
- ✦ Integrated
- ✦ Accurate

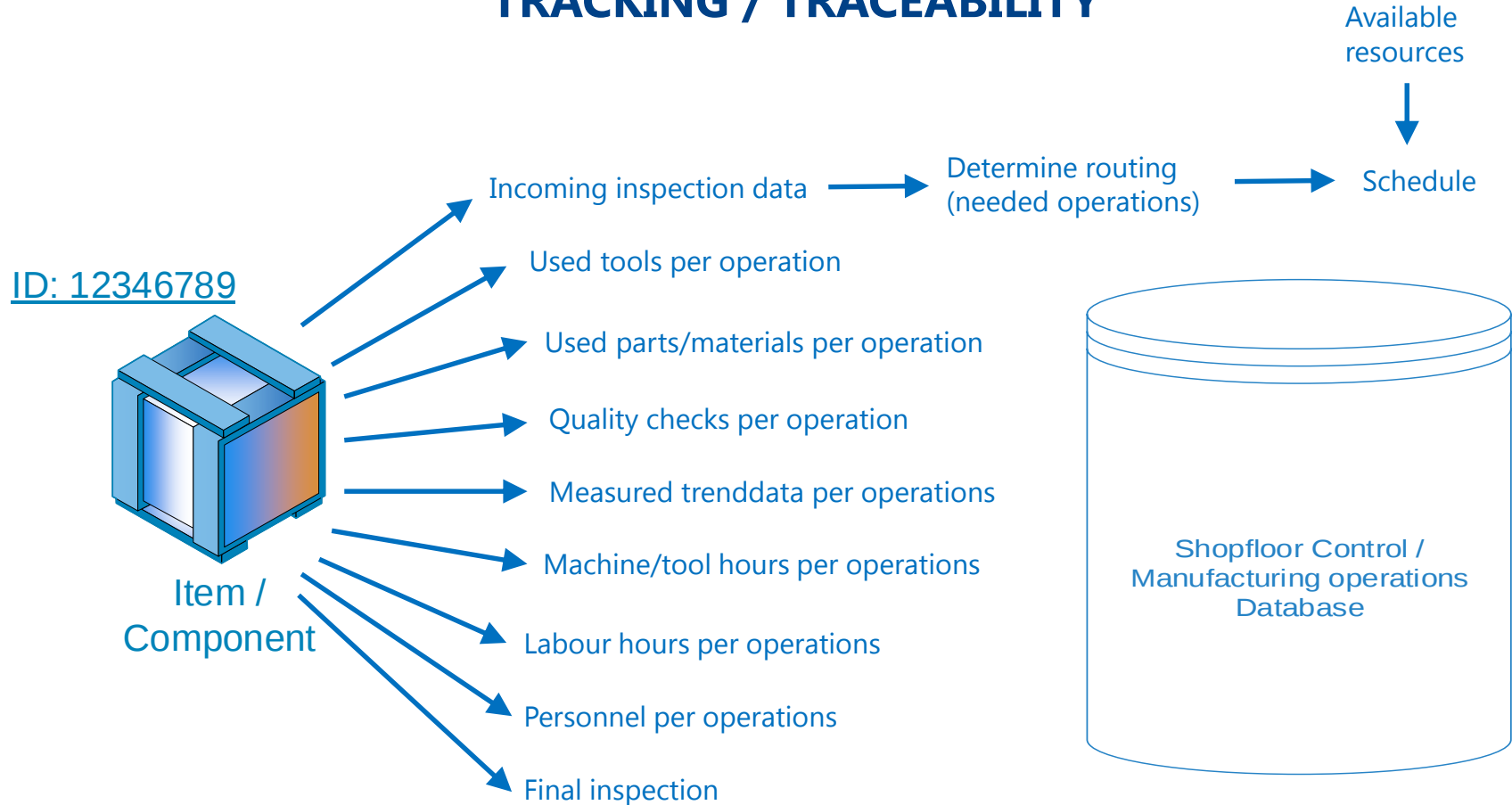
MANUFACTURING OPERATIONS MANAGEMENT



MANUFACTURING OPERATIONS MANAGEMENT



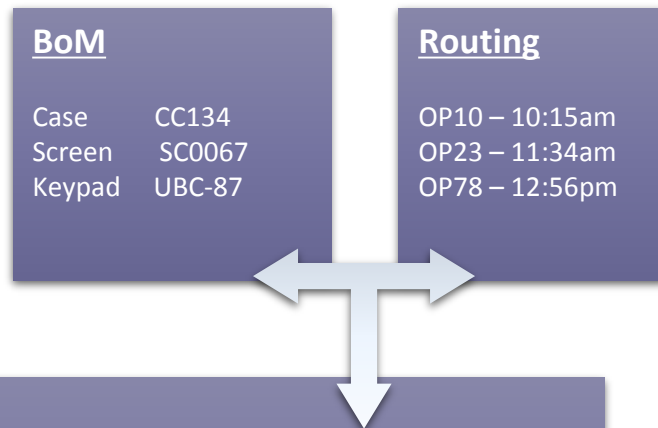
TRACKING / TRACEABILITY



(BUILD) TRACEABILITY

The compilation of all records relating to the production of a finished component including;

- ✦ Datetimes of manufacture per operation
- ✦ Quantity manufactured / used
- ✦ acceptance records to show that the component was produced/maintained according to specifications
- ✦



Build Record

Part	Part #	Serial #	OP & Machine	Date & Time	Engineer
Phone	TN60	SN00567			
Case	CC134	R4J7DR5	OP10 / CaseAssembly21	21/4/10 – 10:15	FGH
Screen	SC0067	O98NY2	OP23 / CaseAssembly21	21/4/10 – 11:34	FGH
Keypad	UBC-87	DBR5H7	OP78 / CaseAssembly21	21/4/10 – 12:56	FGH

BENEFITS OF ONE SHOPFLOOR CONTROL SYSTEM

One system for Shopfloor Control / Manufacturing Operations Management

- ✦ "Knows everything"
- ✦ Create an Intelligent shopfloor control/manufacturing system

Improve consistency and predictability of shopfloor/manufacturing

- ✦ Enforce standard processes
- ✦ Less deviations/surprises

Faster reaction to events

- ✦ Better connected enterprise
- ✦ Automated escalation

Better quality response

- ✦ Share best practice, past

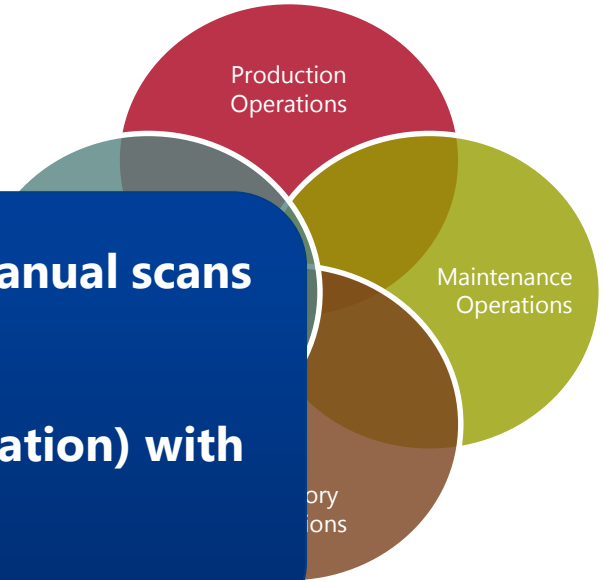
Improve productivity

- ✦ Visual management – real time
- ✦ Support empowerment and accountability

Decision making based on data

- ✦ Continuous Improvement
- ✦ Benchmarking

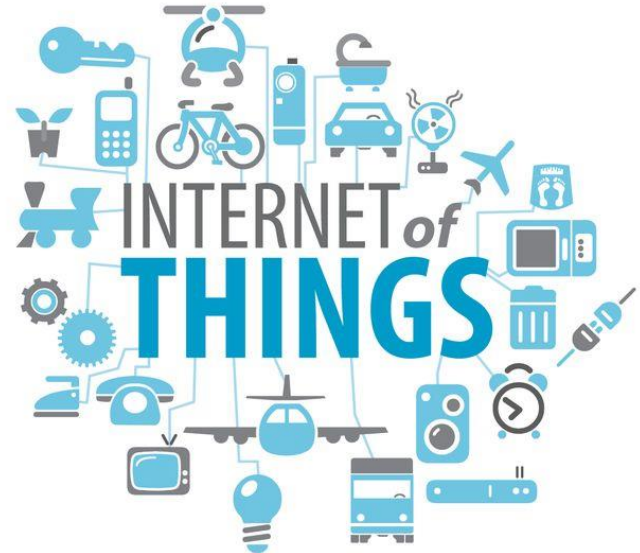
- **RFID provides less data entry & manual scans which increase data quality.**
- **Share contextualized data (information) with partners in the supply chain.**



FACTORY OF THE FUTURE & IDENTIFICATION

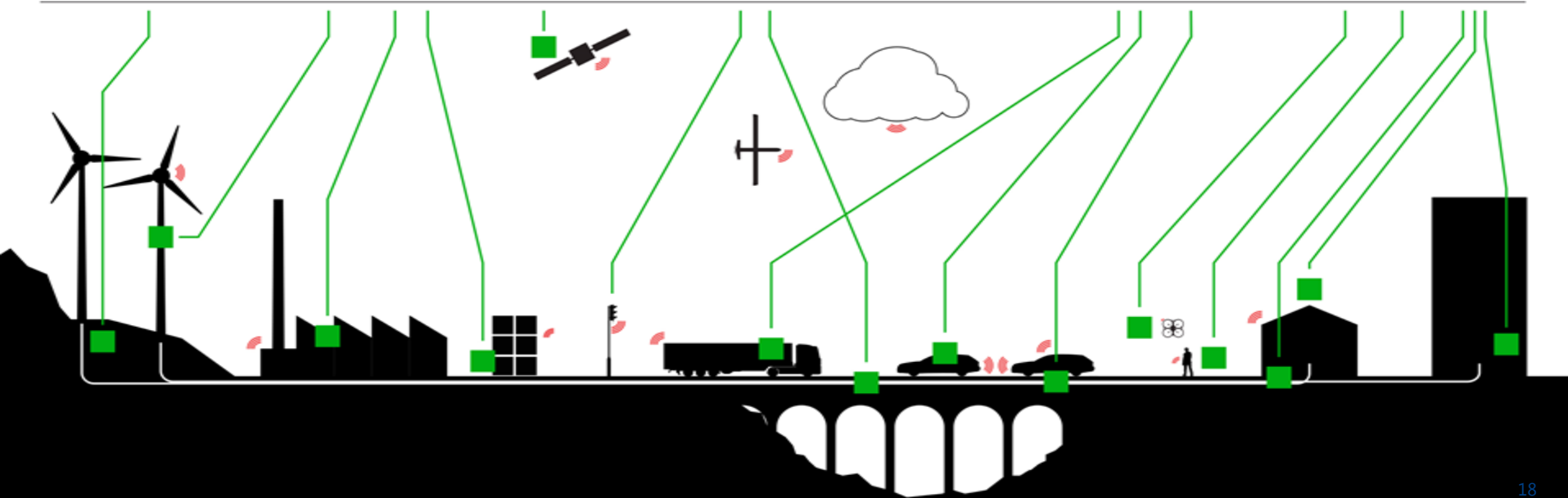
- When sharing data with partners, all partners have the data history of a component.
- All data generated/born within factory walls is known within the supply chain.

**But,..... Would it be added value
if we could monitor data
from a component during
usage?**



INTERNET OF THINGS

- Smart devices; not only identification, but also sensor (e.g. number of cycles, pressure)
- Low Power Wide Area Network (LPWAN, like LoRa, Sigfox)



OPPORTUNITIES IOT

--Predictive maintenance on components:

- └ Based on measured values during component usage request the component for overhaul/maintenance.
- └ Results in more predictive shopfloor schedule.

--Ultimate goal: Prescriptive maintenance on components:

- └ Based on measured values during component usage request the component for together with historic data (big data) and measured data it will be possible to propose / generate an operation schedule including the exact actions which needs to be performed.

OTHER OPPORTUNITIES

-- Augmented reality

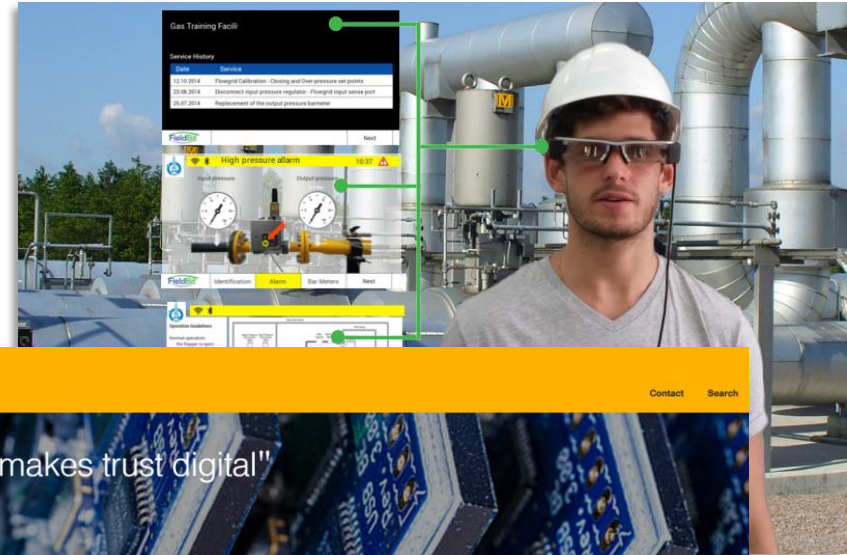
- Service at the customer with remote support of an expert.
- Record service for traceability of repairs.

-- Industrial analytics

- Predictive / Prescriptive.

-- Blockchain

- Verification of original parts



 **Lufthansa
Industry Solutions**

ContactSearch

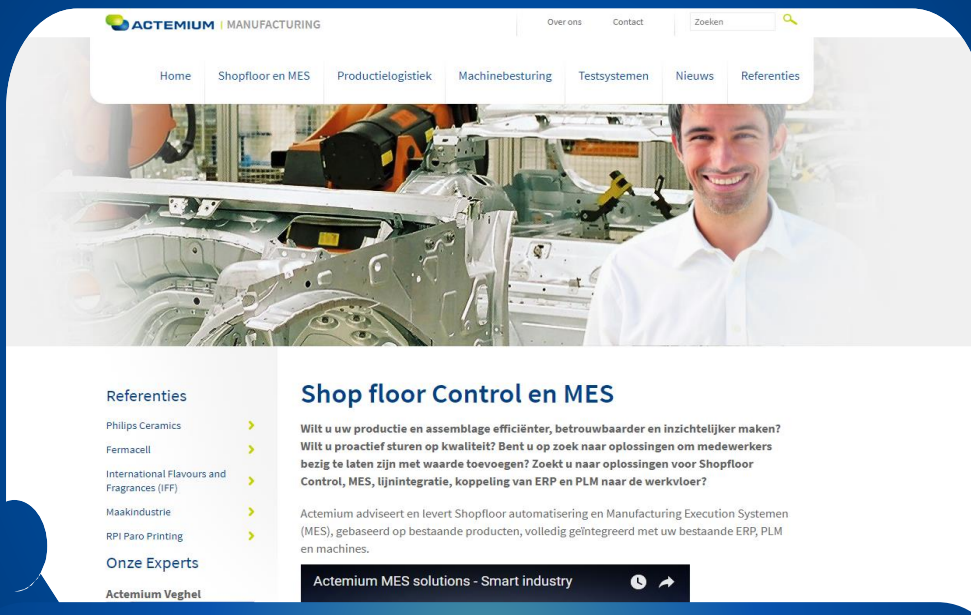
"Blockchain makes trust digital"

 Please contact me:
Patrick Götz
Director Sales New Business



With a wide range of conceivable applications – from the secure tracking of valuable goods to the verification of original parts – blockchain is currently at the center of intense debate. Dr. Carsten Böhle, Technology Consultant at Lufthansa Industry Solutions, explains why new processes are essential to seizing the technology's potential.

HTTP://MANUFACTURING.ACTEMIUM.NL/



Thanks for your attention