Nobilia: flessibilità e produzione lot-size-1 secondo il paradigma Industria 4.0

Ing. Giuseppe Lettere
Automation Product Specialist
Beckhoff Automation S.r.l.

Organizzato da

Nobilia Werke J. Stickling GmbH & Co. KG

Series production of fitted kitchens

Maximum data transparency in kitchen manufacturing through **PC-based control technology:**

- ✓ Series production of **2,600** fitted kitchens every day with **lot-size-1** flexibility;
- ✓ **Production planning** aligned with loading data and the correct truck;
- ✓ Transparent data storage with central works database as basis for an **Industry 4.0** concept.

Industry 4.0 requires real-time data over the entire process

Modern Industry 4.0 concepts are not possible without ensuring transparency of all machine and parts data.

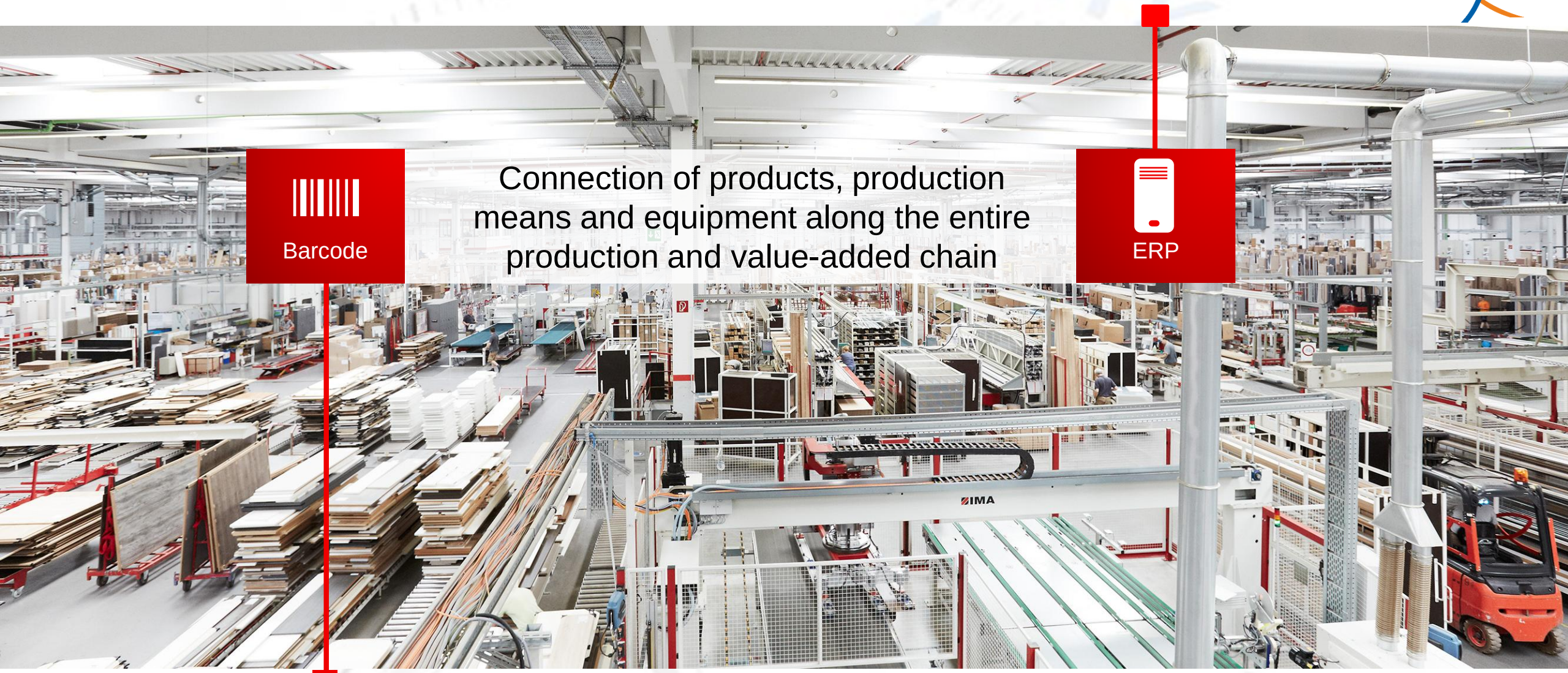
- ✓ Real-time tracking capability over the entire process. This starts by applying a barcode label that contains all necessary information about a piece of furniture;
- ✓ Each processing machine scans the barcode and retrieves the associated machining data (processing steps, logistic details, loading time, truck information, delivery address….) from the central database or from web services;
- ✓ The production facility accordingly supplies all required parts, initiates the correct processing sequences, and ensures that the desired drawer is placed in a logistic train "*just in sequence*".

"***Through real-time tracking, we know exactly where each part is in the production process at any time. That corresponds precisely to the Industry 4.0 approach***"

Implementation: **2014**

Collaboration since: **1990**

Industry 4.0 requires real-time data over the entire process



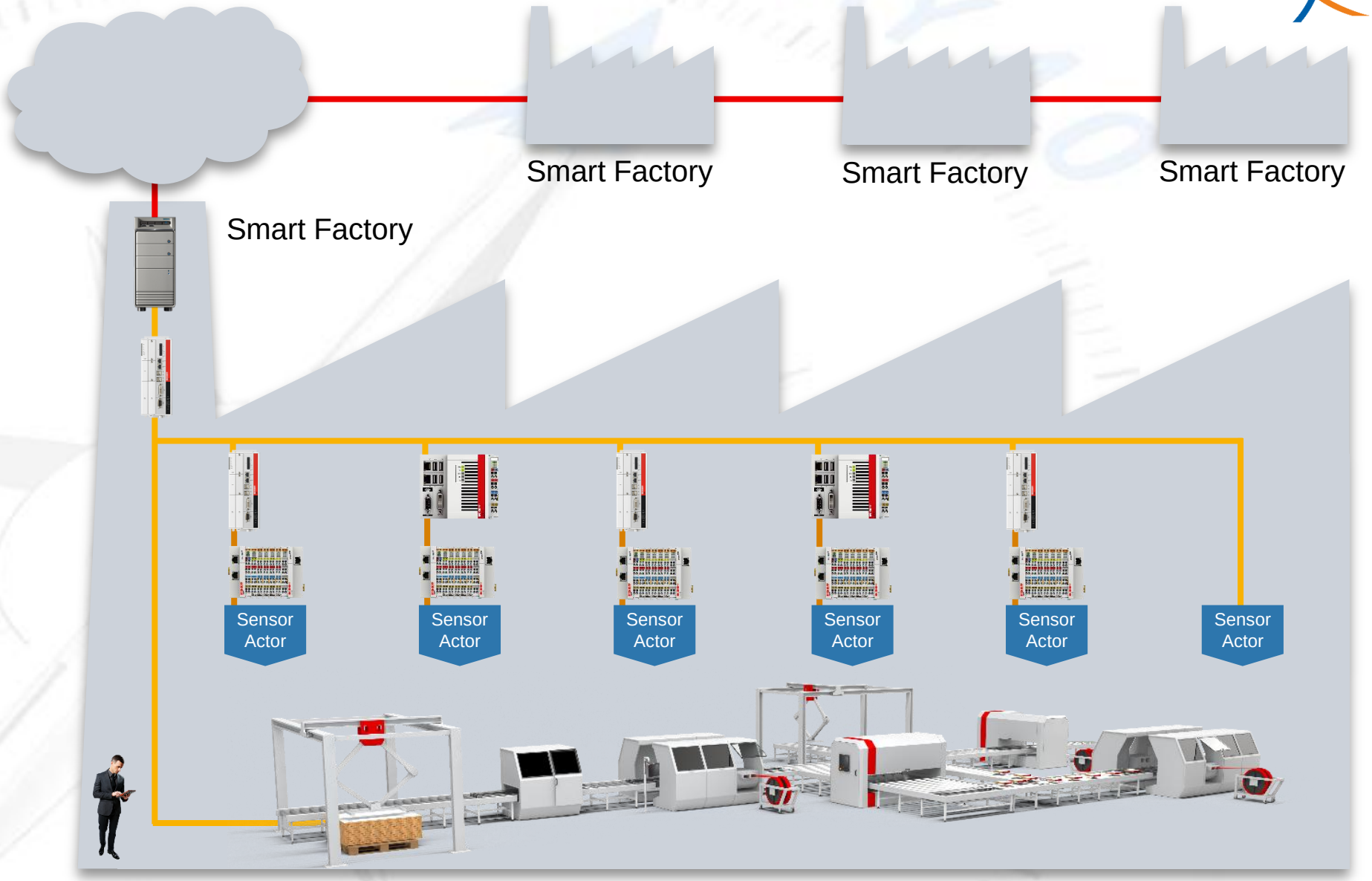
Industry 4.0 requires real-time data over the entire process

"*Through real-time tracking, we know exactly where each part is in the production process at any time. That corresponds precisely to the Industry 4.0 approach*"

Industry 4.0 requires:

1. **Secure** horizontal and vertical **communication**;
2. Consistent and **integrated engineering** over the entire product life cycle;
3. Central cyber-physical **data acquisition**, **analysis** and **evaluation**;
4. Control solution based on **open Automation** and **IT standards**;
5. Human operators at the central point of control in a **networked production**.

Industry 4.0 in a **Smart Factory**



Industry 4.0 in a **Smart Factory**

Vertical: SCADA / MES / ERP with PLC

- Access to process data in PLC

Horizontal: PLC with PLC

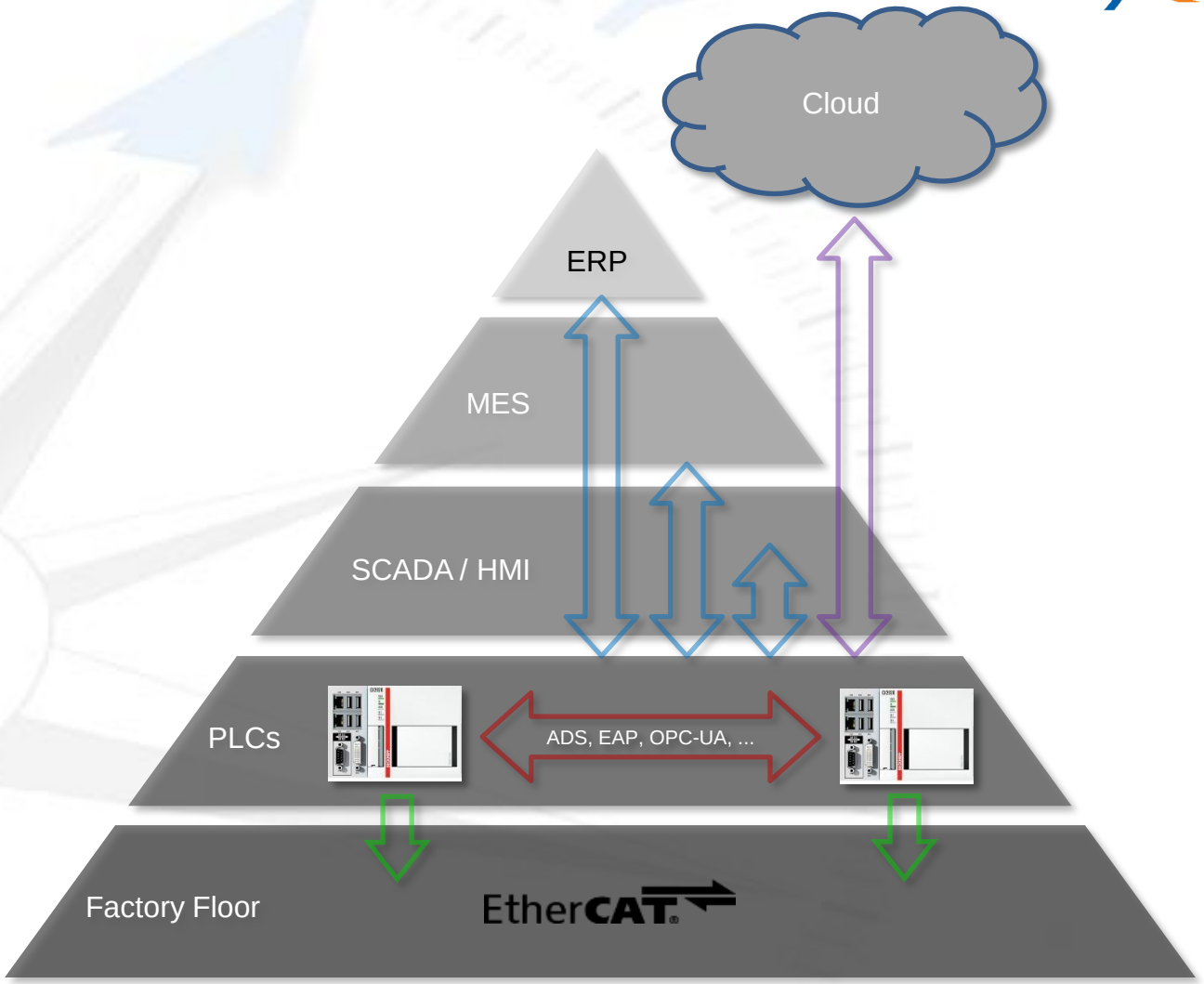
- Protocol access for data exchange

I/O: PLC with Fieldbus

- Access to data profiles in shop floor devices

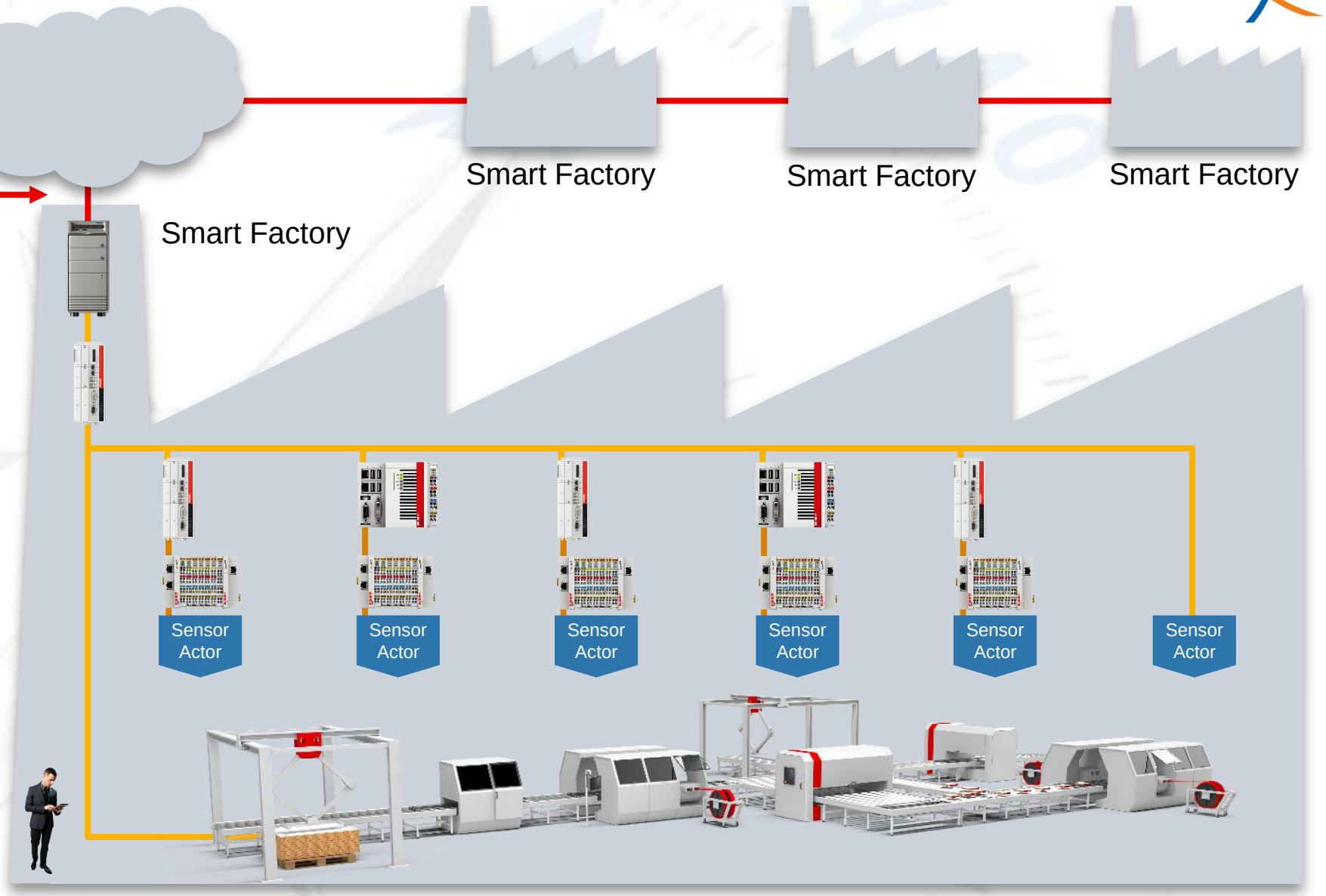
Cloud: PLC with Cloud

- Access to Cloud for Data Logging



1. **Secure** horizontal and vertical **communication**

IoT: MQTT/AMQP
OPC UA
ADS



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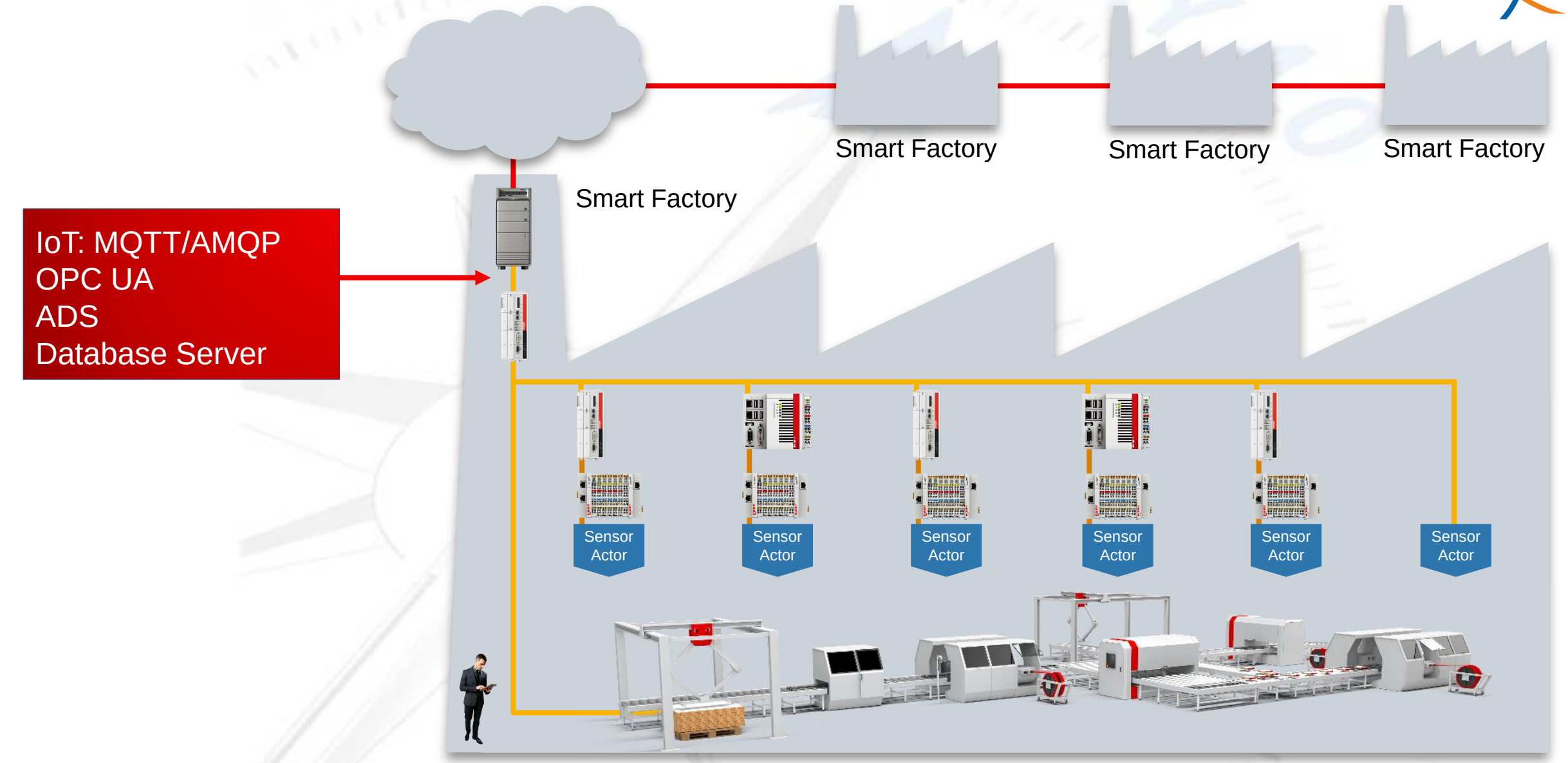

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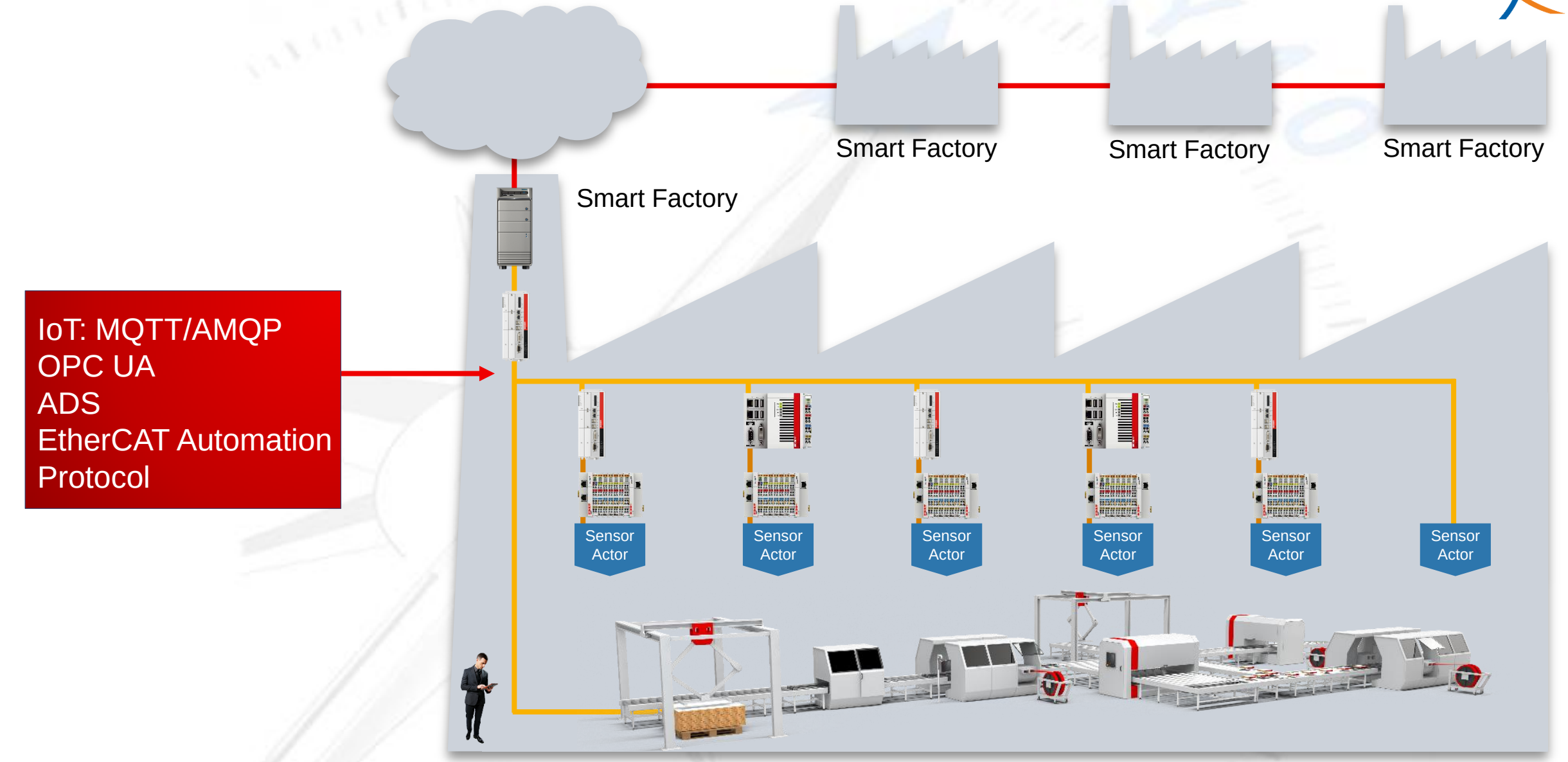

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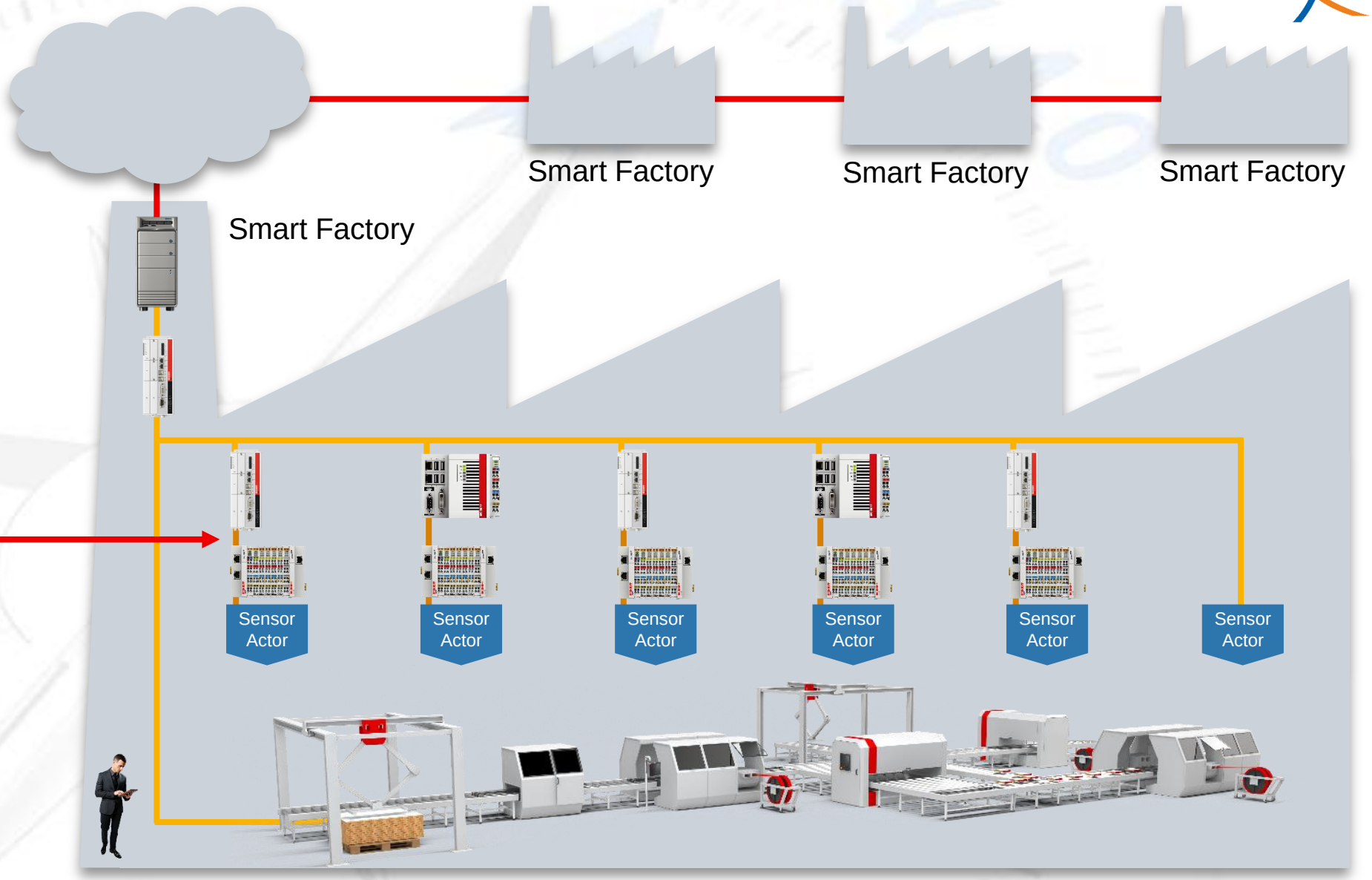
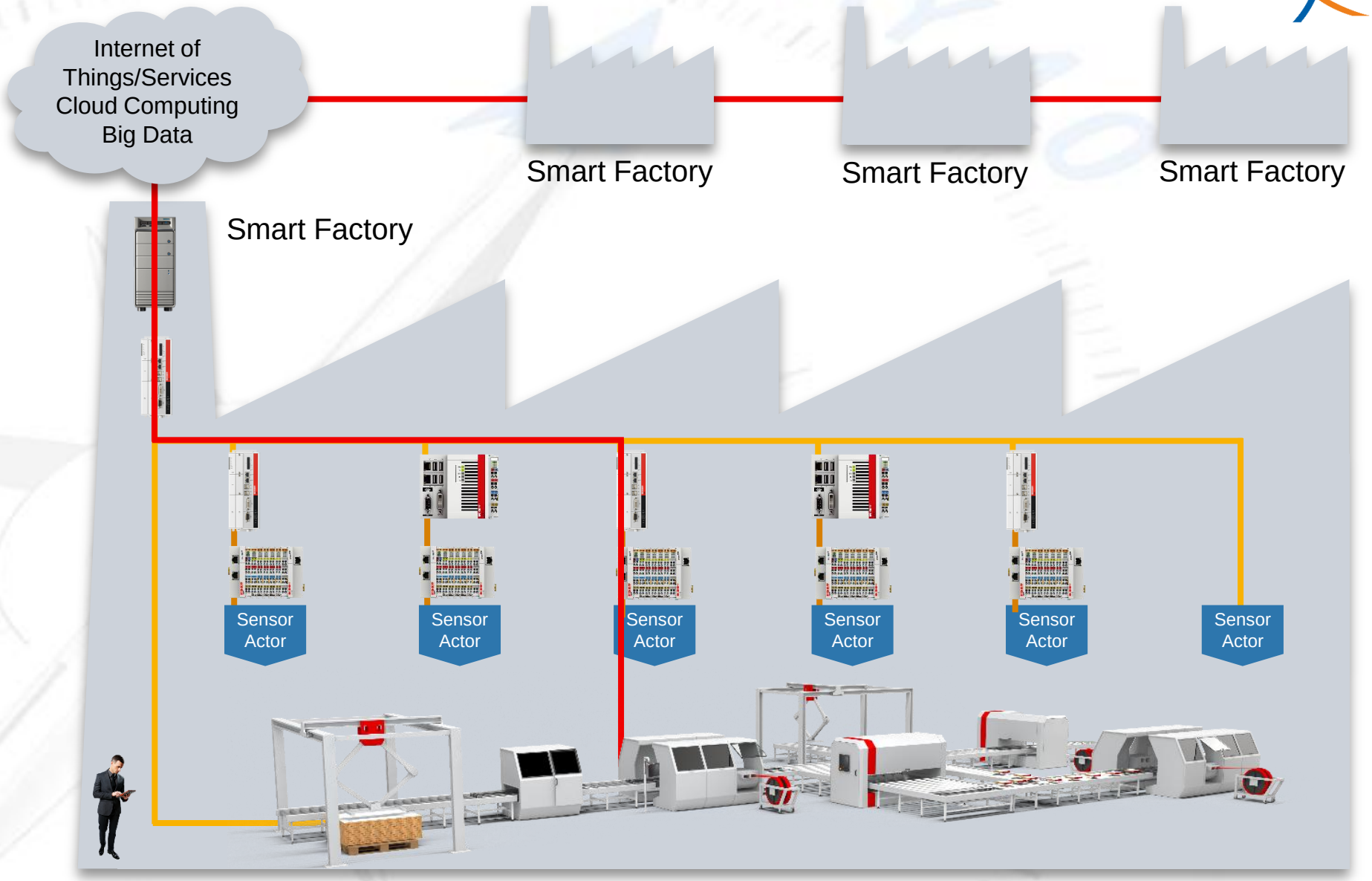


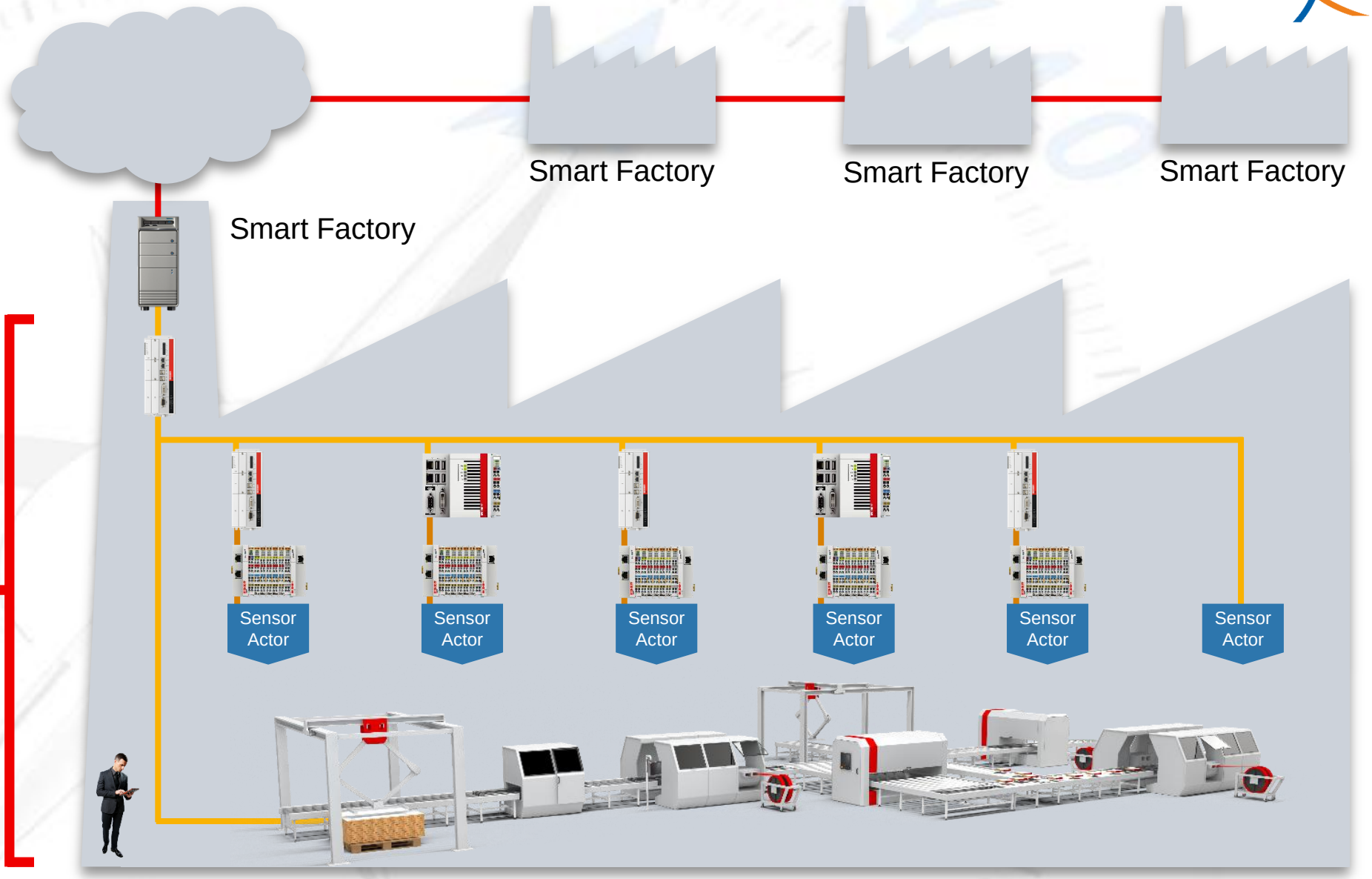
EtherCAT
Ethernet TCP/IP
Profinet
Profibus
Ethernet/IP
…

1. **Secure** horizontal and vertical **communication**



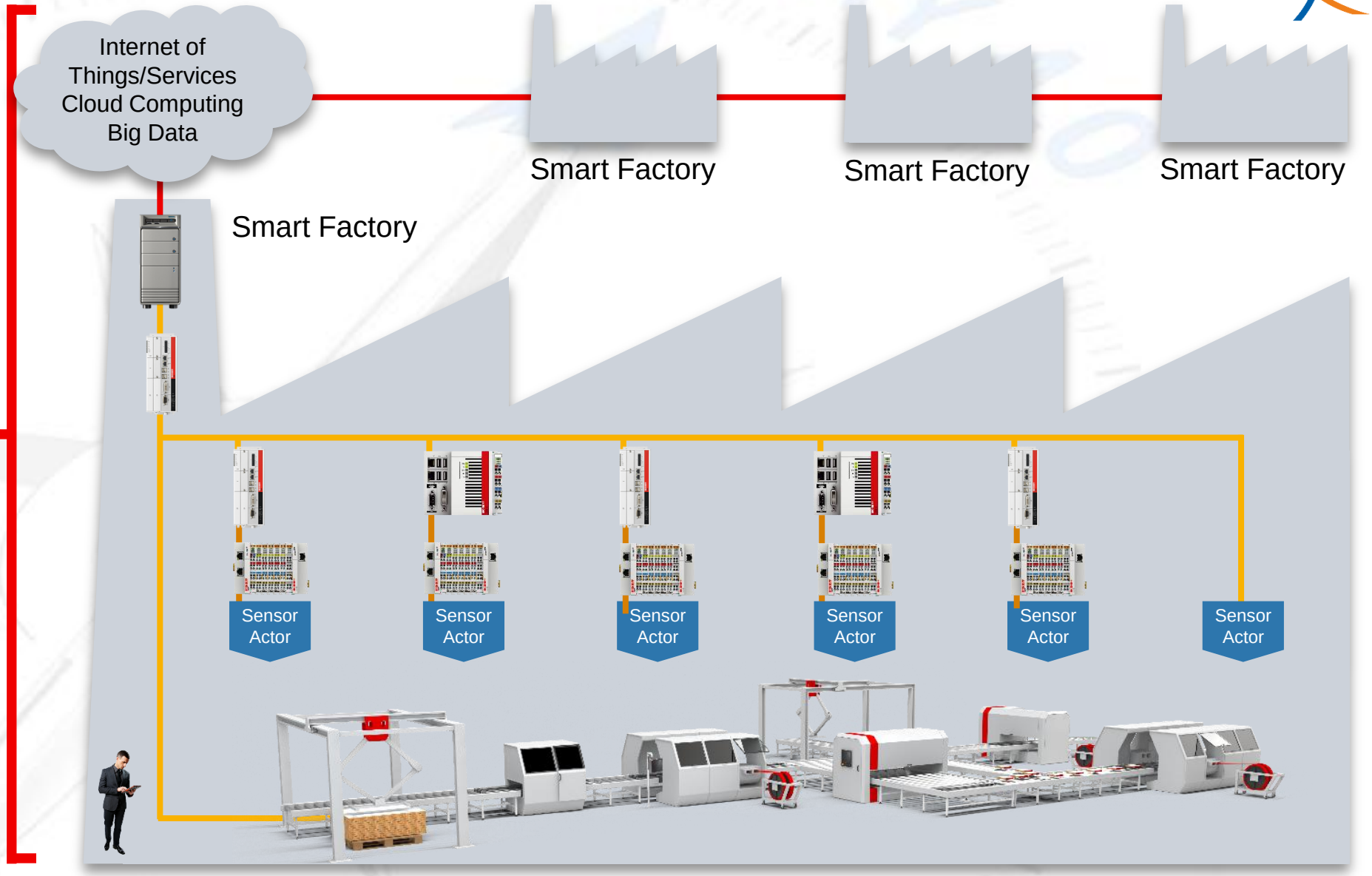
2. Consistent and **integrated engineering** over the entire product life cycle

Engineering:
- I/O
- PLC, C++
- Motion Control
- Safety
- Connectivity
- Measurement
- Analytics
- HMI
- Vision
- Machine Learning
- Simulation
- …

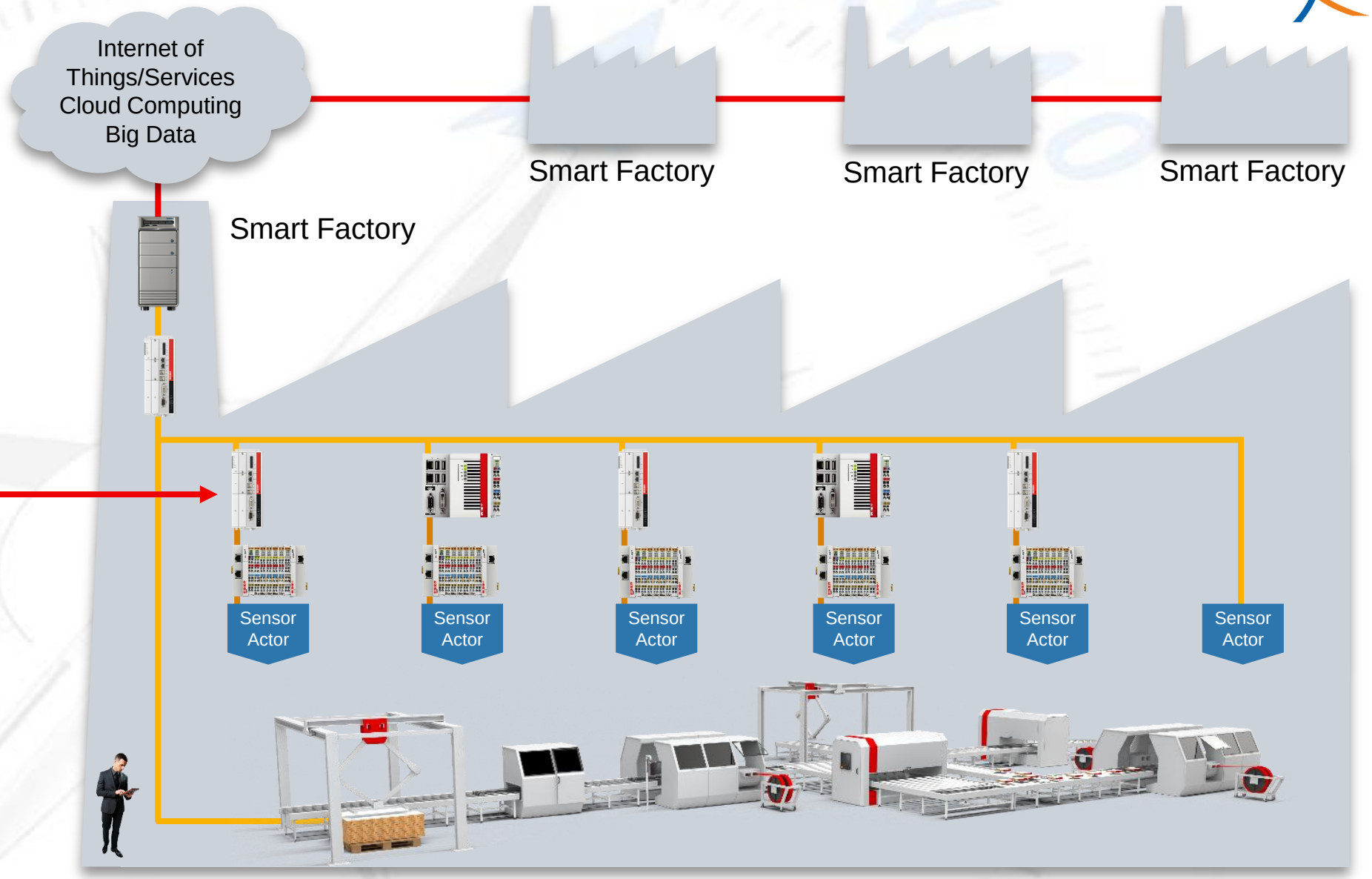


3. Central cyber-physical **data acquisition**, **analysis** and **evaluation**

Scientific Automation:
- Measurement
- Analytics
- Condition Monitoring
- Power Monitoring



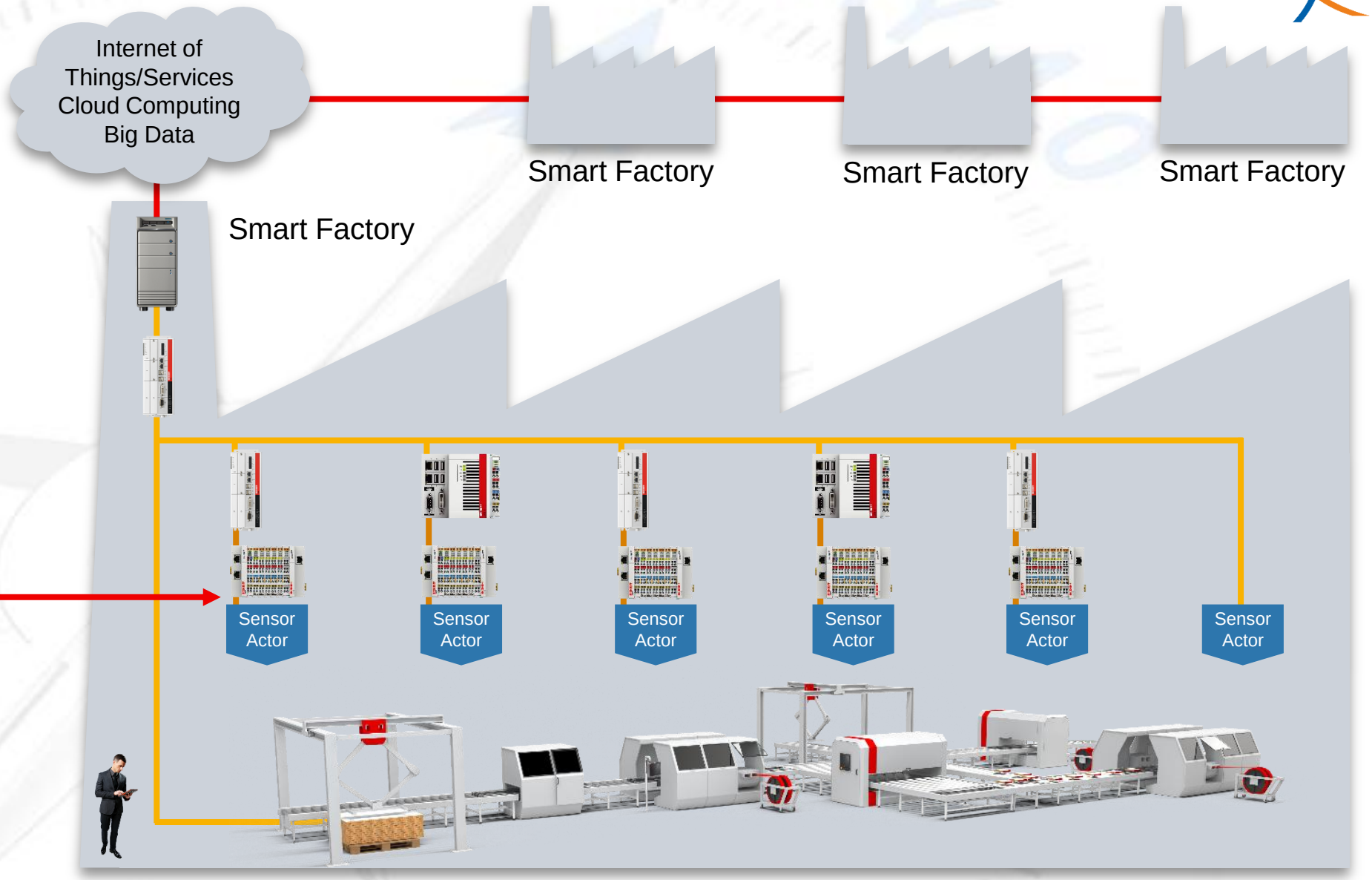
4. Control solution based on **open Automation** and **IT standards**



Automation

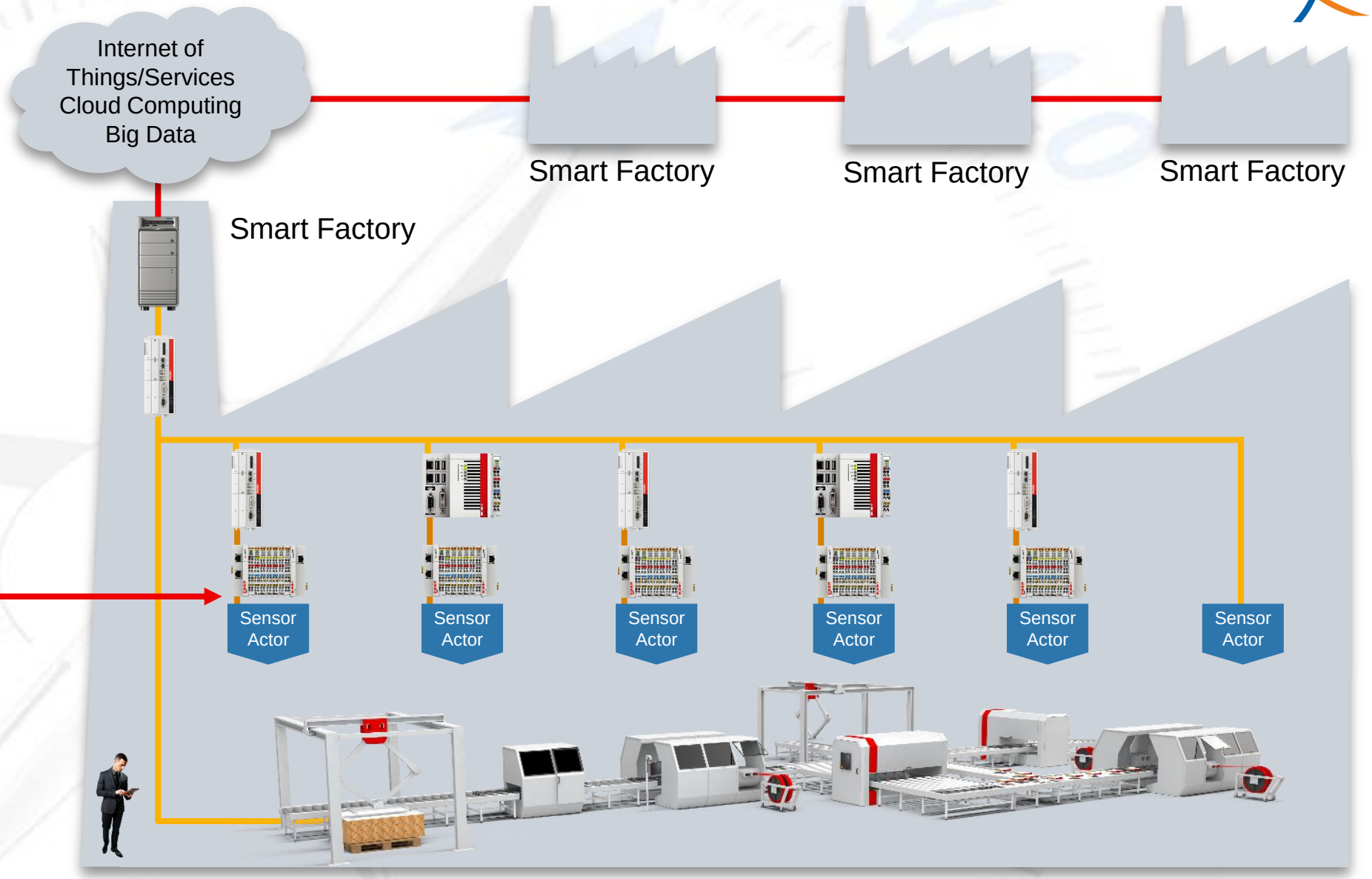
- PC-based control
- PLC
- NC, CNC
- Robotics
- Safety
- …

4. Control solution based on **open Automation** and **IT standards**



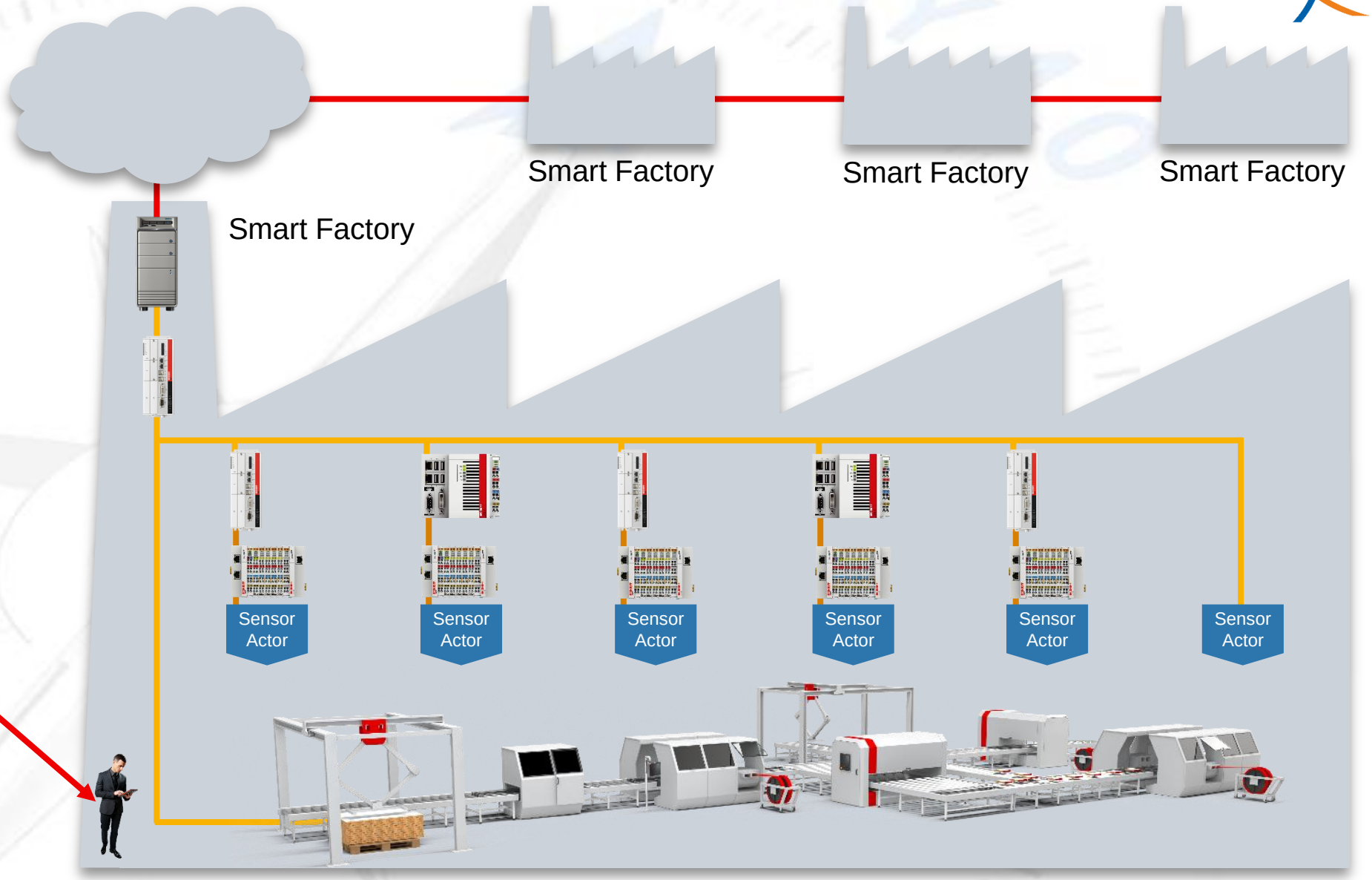
Sensors/actors
- I/O
- Drives
- Valves

4. Control solution based on **open Automation** and **IT standards**



Identification
- QR code
- Barcode
- RFID
- Camera

5. Human operators at the central point of control in a **networked production**



Smart Factory
Internet of things
Internet of service
Big data
Cloud computing
Cloud engineering
Adaption
Self optimization
…

Summary

Customer **advantages**:

- ✓ High **productivity** thanks to **universal PC-based control** technology with high computing **performance** and through **real-time tracking**
- ✓ **Open** and **high-performance** PC Control as basis for **universal data storage** in a heterogeneous manufacturing environment
- ✓ PC-based control offers possibilities for combining control units into **standardized** plant types as well as for **commissioning-friendly** modularization of plants
- ✓ Minimized engineering and **costs** thanks to cooperation of many years
- ✓ Various control-related innovation potentials for the further development of the **Industry 4.0** concept

Summary

Industry 4.0 easily implemented:

- ✓ Highly customised production (**lot size 1**);
- ✓ Increased machine/plant **availability** and **reliability**;
- ✓ Maximised **production efficiency**;
- ✓ Optimised **resource efficiency**;
- ✓ Optimised **quality** (products and processes);
- ✓ **Traceability**;
- ✓ **Faster time to market**;
- ✓ Increased employee **satisfaction**;
- ✓ Future **sustainability**;
- ✓ Securing **competivity** in global markets.