



SAP Leonardo Live

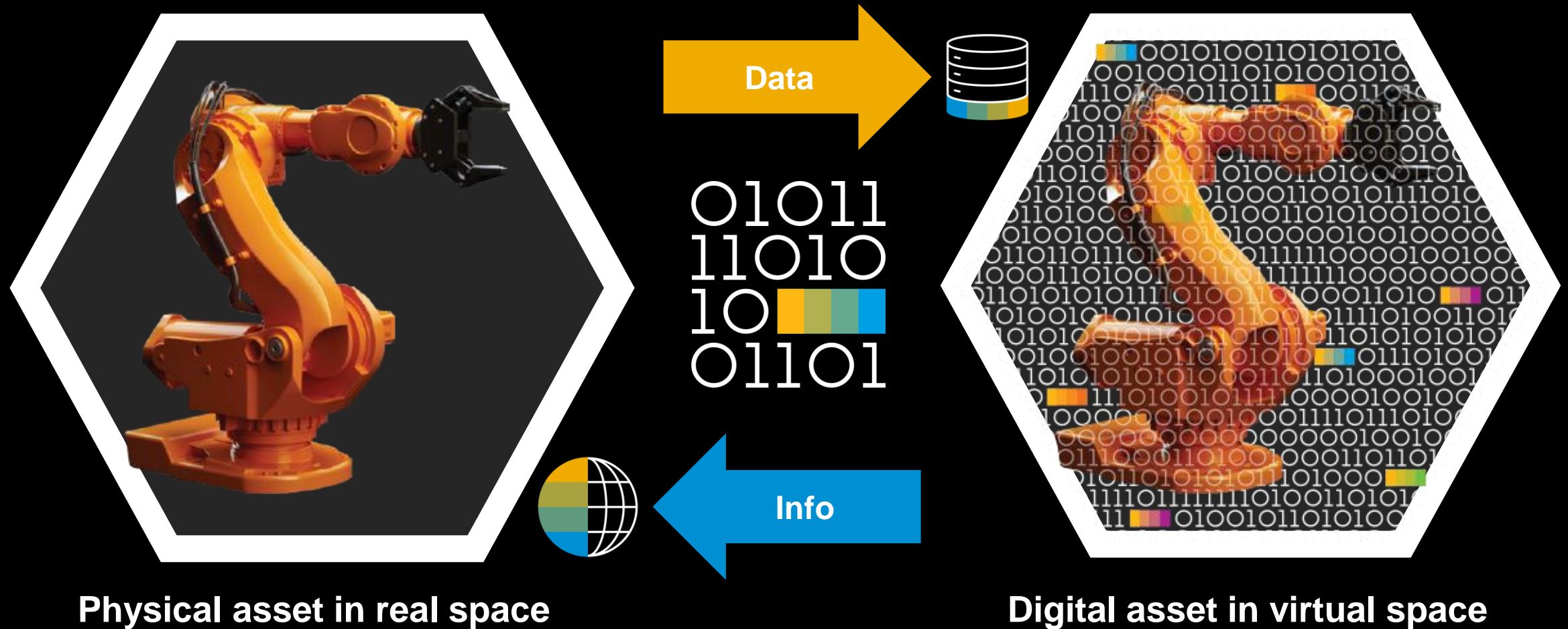
Not just another business conference

Synchronizing a Network of Digital Twins

Lars Olson, SAP

PUBLIC

Original digital twin defined as a 'one-to-one' relationship

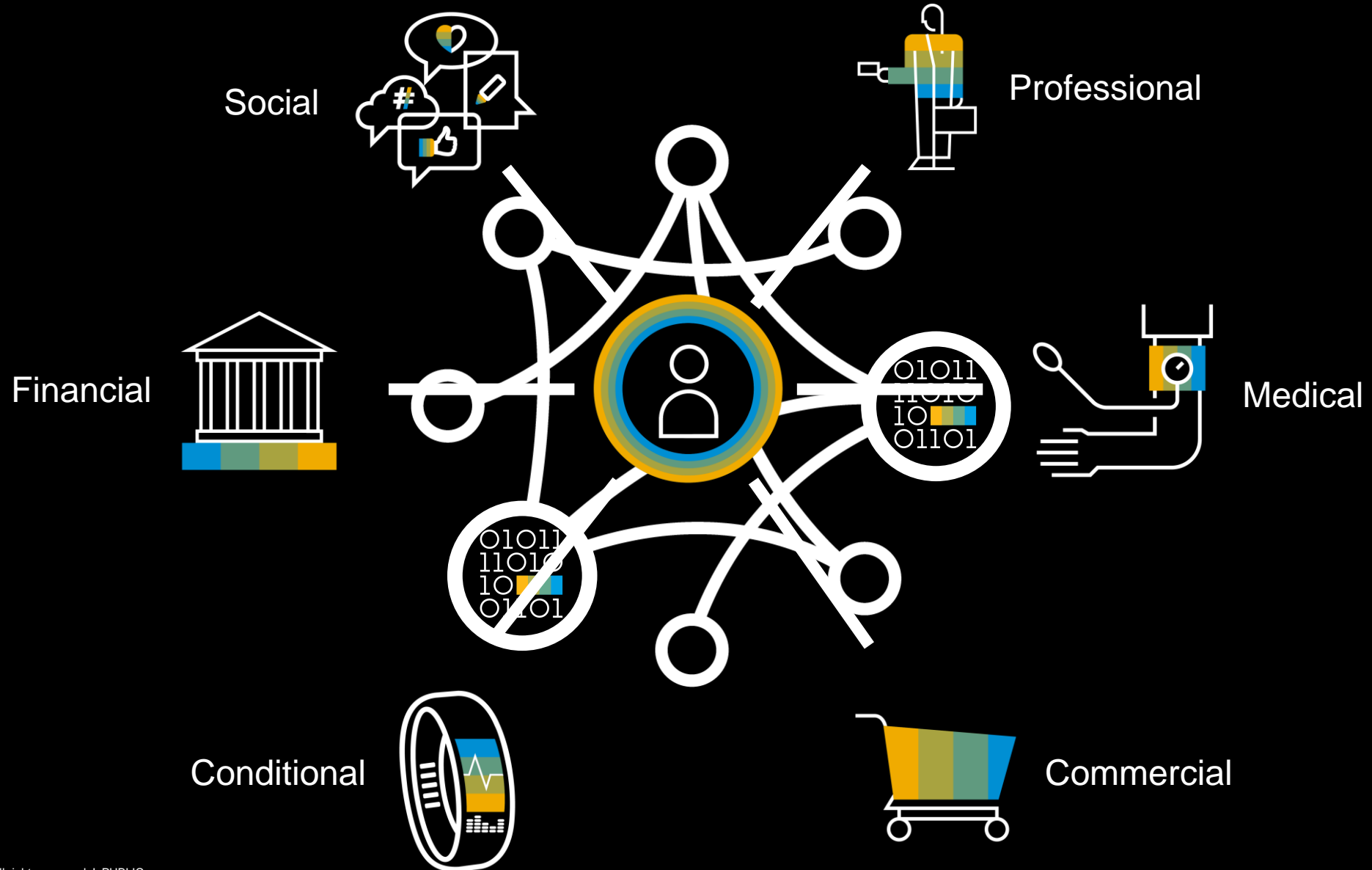


Network of digital twins

“Think of humans having digital twins. To understand how the body works and improve its health, **your digital twin must model more than the physical parts of the body. It must model how your entire body works together.”**

[Dan Woods](https://www.forbes.com/sites/danwoods/2016/12/23/how-to-put-your-digital-twin-on-steroids/#7a96a8356196), Forbes: <https://www.forbes.com/sites/danwoods/2016/12/23/how-to-put-your-digital-twin-on-steroids/#7a96a8356196>

The digital twin of you



The network of digital twins

Connected relationships between digital twins to drive business outcomes

SAP's position

- As markets shift to mass customization and new service delivery models, manufacturers, operators, producers, and service companies have to be far more **dynamic and agile** to satisfy customer expectations while ensuring efficiency in their design, manufacturing, and service processes.
- The network of digital twins synchronizes the **virtual, physical, conditional, and commercial definitions** of assets and products in real time to accelerate innovation, optimize operating performance conditions, predict service requirements, improve diagnostics, and enhance decision-making throughout the value network.
- The network of digital twins creates a **“relationship between digital twins”** to enable secure and distributed systems of record; real-time collaboration with suppliers, partners, and 3rd-party service providers; new business model delivery; and advanced analytics.



The network of digital twins

Digital, physical, conditional, commercial



Manufacturer

Product intelligence

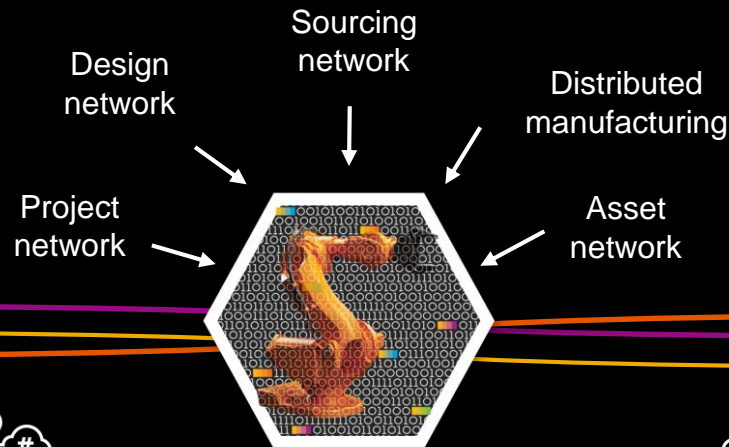
Predictive engineering and R&D



Product information management

Product view of the digital twin

- Project and portfolio management
- Compliant product lifecycle management
- Project and product intelligence



Digital twin of one

3D design and simulation data

Production and quality data

Component/ingredient data

Service and maintenance data

Cost and profitability data



Operator

Asset intelligence

Predictive maintenance and service



Asset information management

Asset view of the digital twin

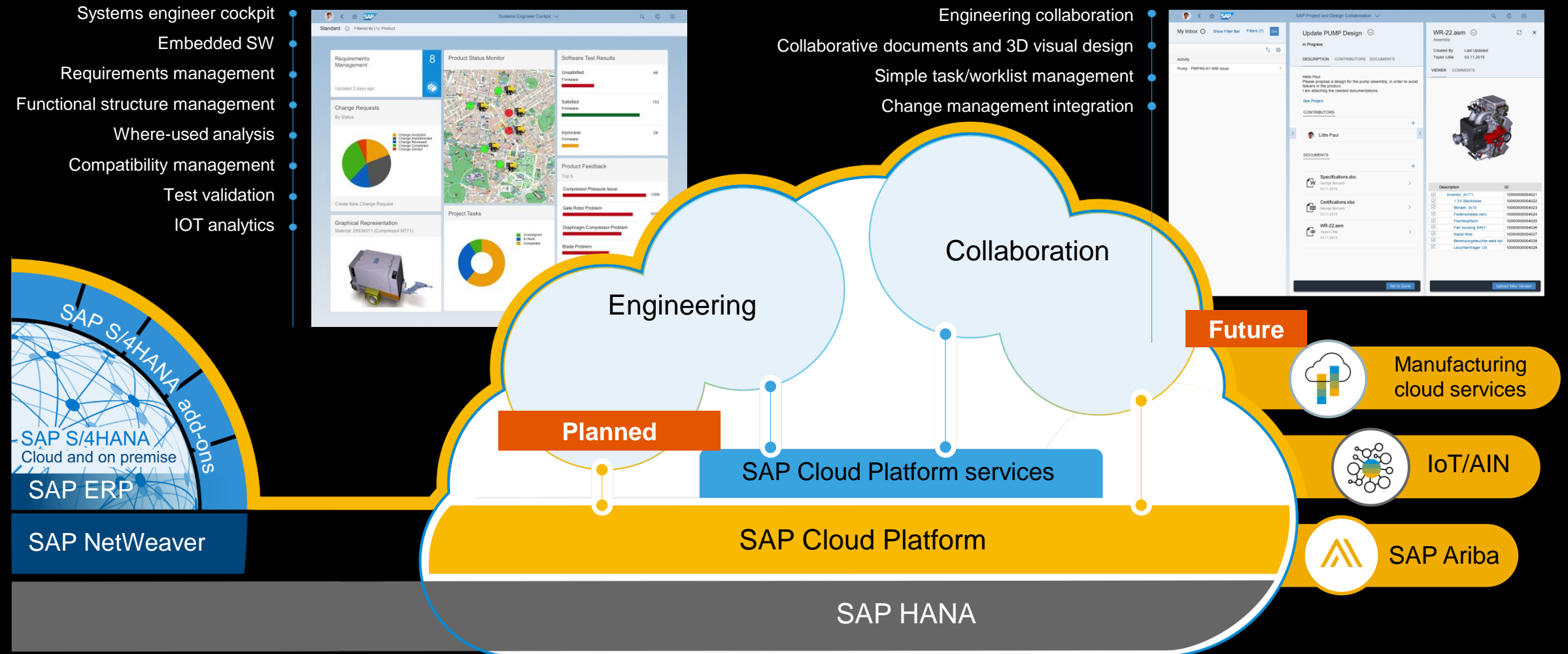
- Asset strategy and performance
- Asset prediction and optimization
- Asset intelligence

SAP S/4HANA Cloud for intelligent product design



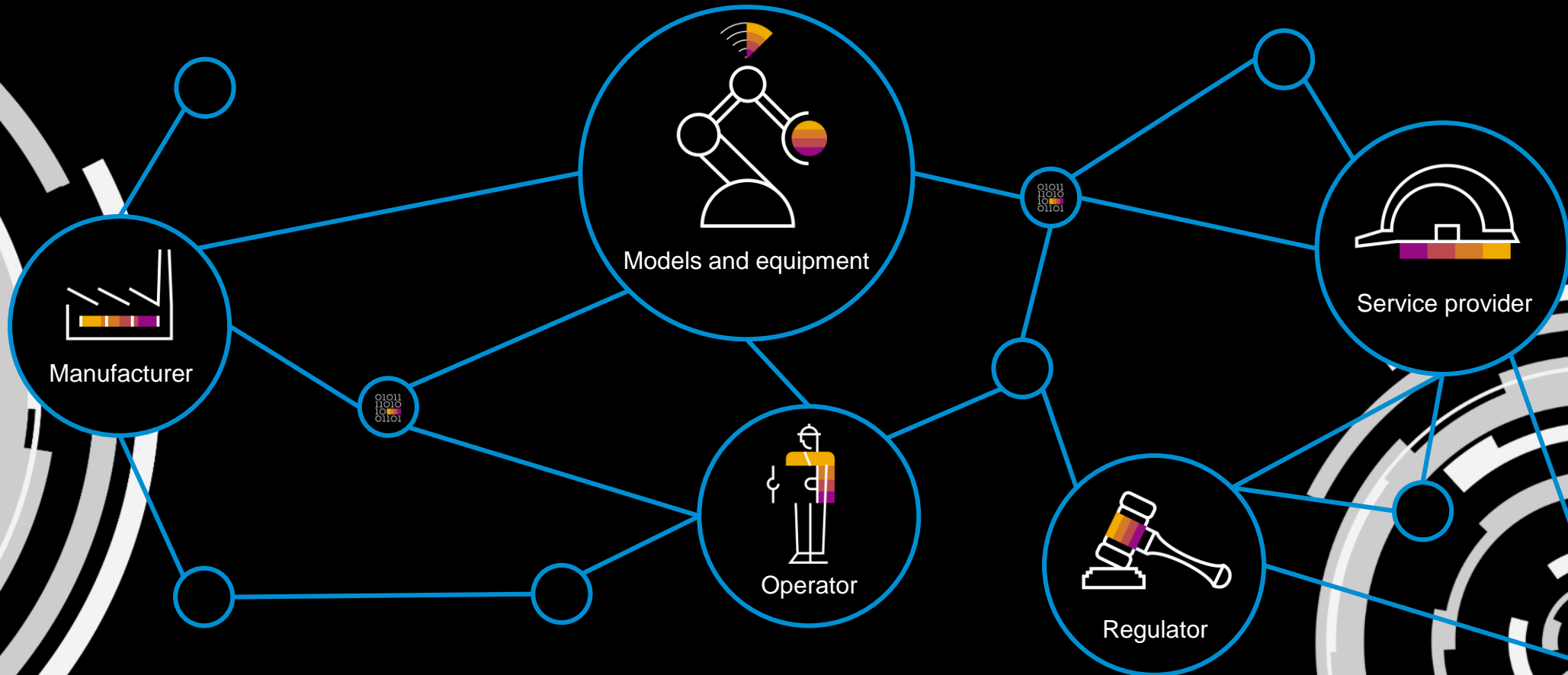
LAB preview

SAP S/4HANA cloud for intelligent product design helps to **accelerate product innovation** with **instant collaboration**, **requirement-driven product development**, and **actionable live insights** across the **extended enterprise**.



SAP Asset Intelligence Network

Bringing together business partners



A digital representation of all industrial equipment used in the field with secure, controllable sharing rights across business partners to enable customer insights, performance analytics, and new digital services

SAP Asset Intelligence Network

What it looks like – how it works

Ease of use

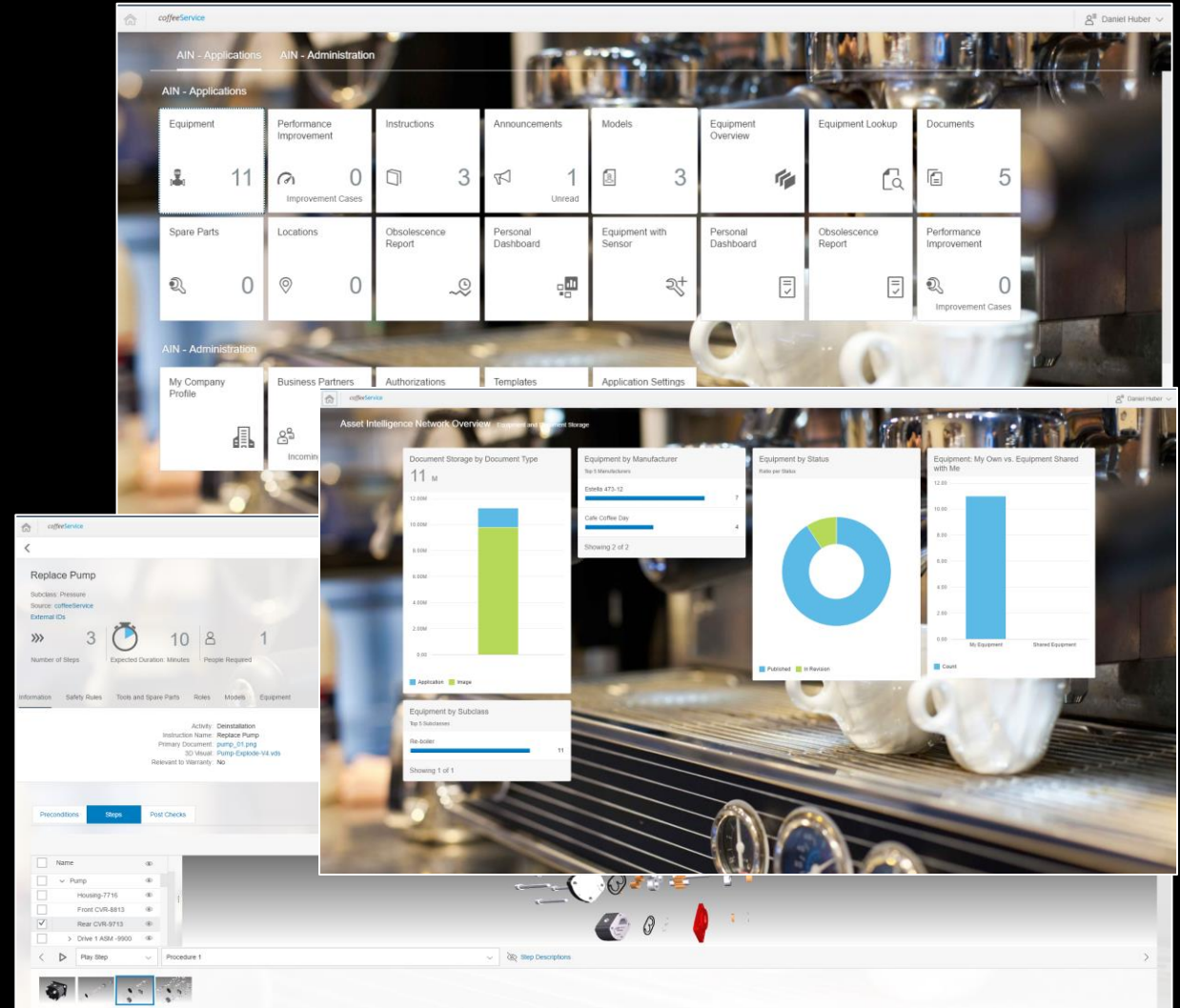
SAP Asset Intelligence Network is a cloud-based business network with a consumer-grade user experience, smoothly integrated with SAP Fiori and SAP Fiori launchpad.

Simple and secure onboarding

- For manufacturers; operators; engineering, procurement, and construction (EPC) firms; and service providers

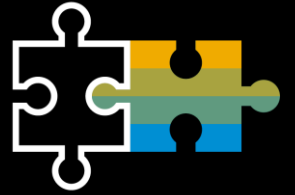
Powerful business content and analytics

- Introduce a digital twin to represent each physical machine or product along its asset lifecycle
- Standardize equipment management through asset master data and spare-parts information available for update from the network
- Streamline maintenance through access to the latest documents and service bulletins on maintenance strategies
- Achieve collaborative design and execution for complex installation or maintenance procedures



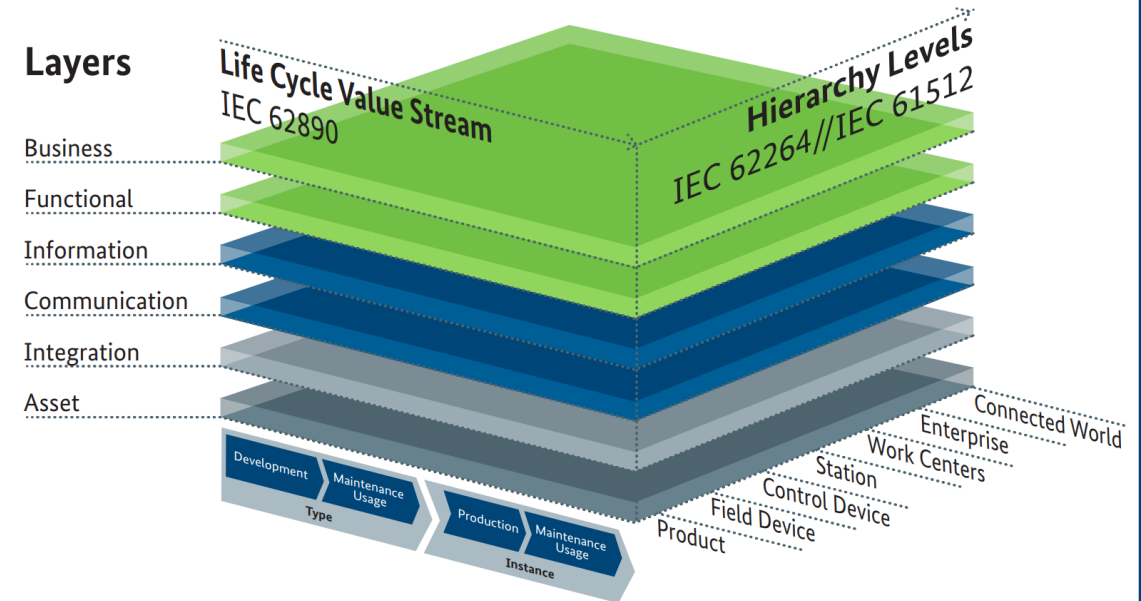
Technically synchronizing a network of digital twins

SAP Asset Intelligence Network supports the RAMI 4.0 administration shell



- One single source of truth for the asset/equipment
- Information about the utilization of the asset
- Accessible through APIs, based on a service-oriented architecture
- Information about different application aspects (installation, business partners, condition monitoring, tickets, spare parts, ...)
- Support for unique identifiers, types, and instances
- Manufacturer- and operator-specific attributes

Reference architecture model Industrie 4.0 (RAMI 4.0)



Source: Plattform Industrie 4.0 and ZVEI

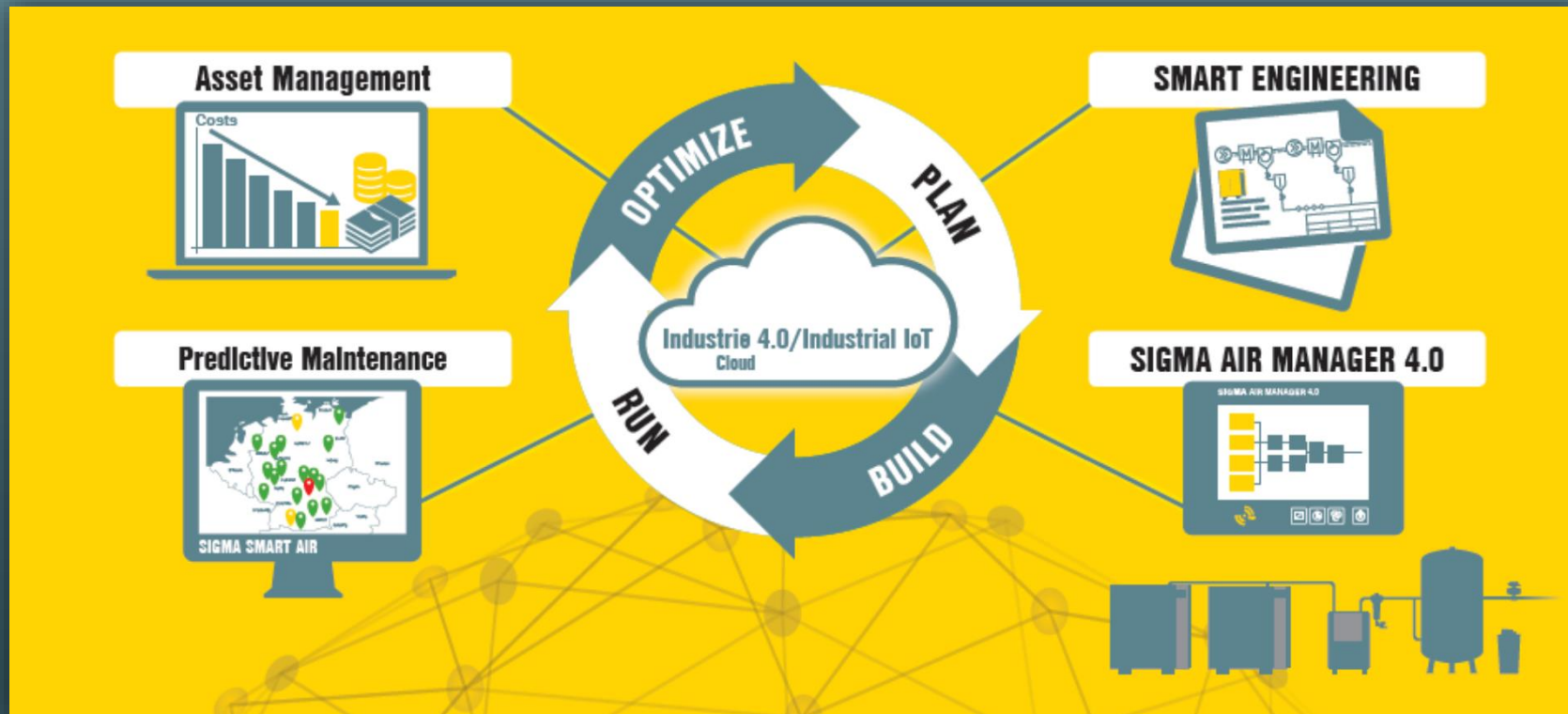
Source: http://www.plattform-i40.de/I40/Redaktion/EN/Downloads/Publikation/structure-of-the-administration-shell.pdf?__blob=publicationFile&v=5

KAESER Kompressoren

Customer success



Smart air strategy execution



KAESER SIGMA SMART AIR

Projectable

- KAESER is responsible for operations and maintenance of the compressed air station
- Service level agreements for the production of compressed air
- Monthly settlement based on consumption of compressed air

Improve overall equipment effectiveness (OEE)

Effective

- Avoid planned and unplanned downtime – High availability
- Improve energy efficiency
- Reduce service costs by optimizing maintenance and eliminating incidents

Consulting

Intelligent

- Adapt compressed air station to changing customer demand during the lifecycle

Usage information is the basis for value-added services

5. Operations

- Maintenance services
- Calibration services
- Performance as a service
- ...

4. Commissioning

- Commissioning services
- ...



1. Engineering

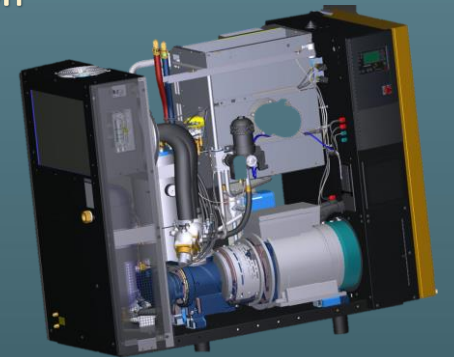
- Engineering services
- 3D model conversion
- ...

2. Procurement

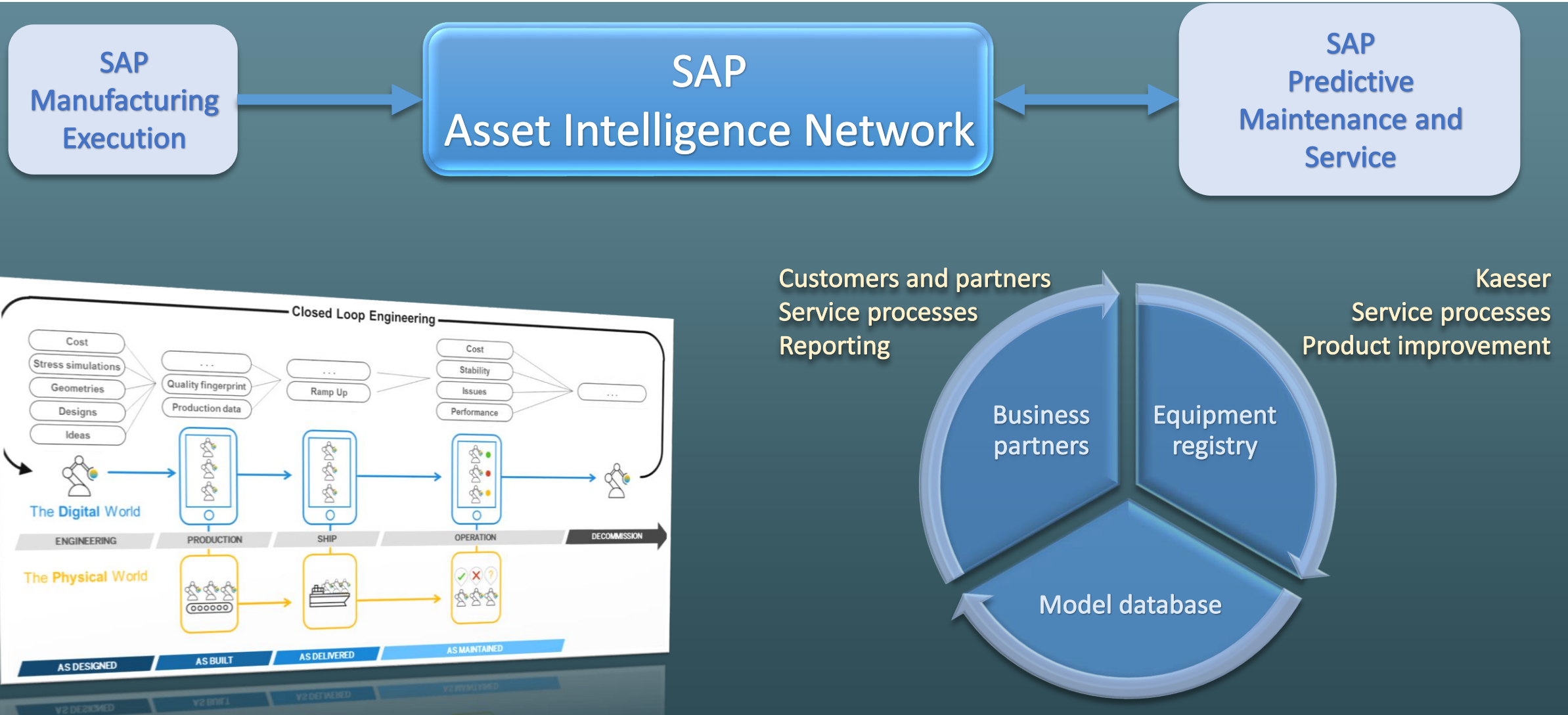
- E-procurement services
- Digital twin as USP
- ...

3. Installation

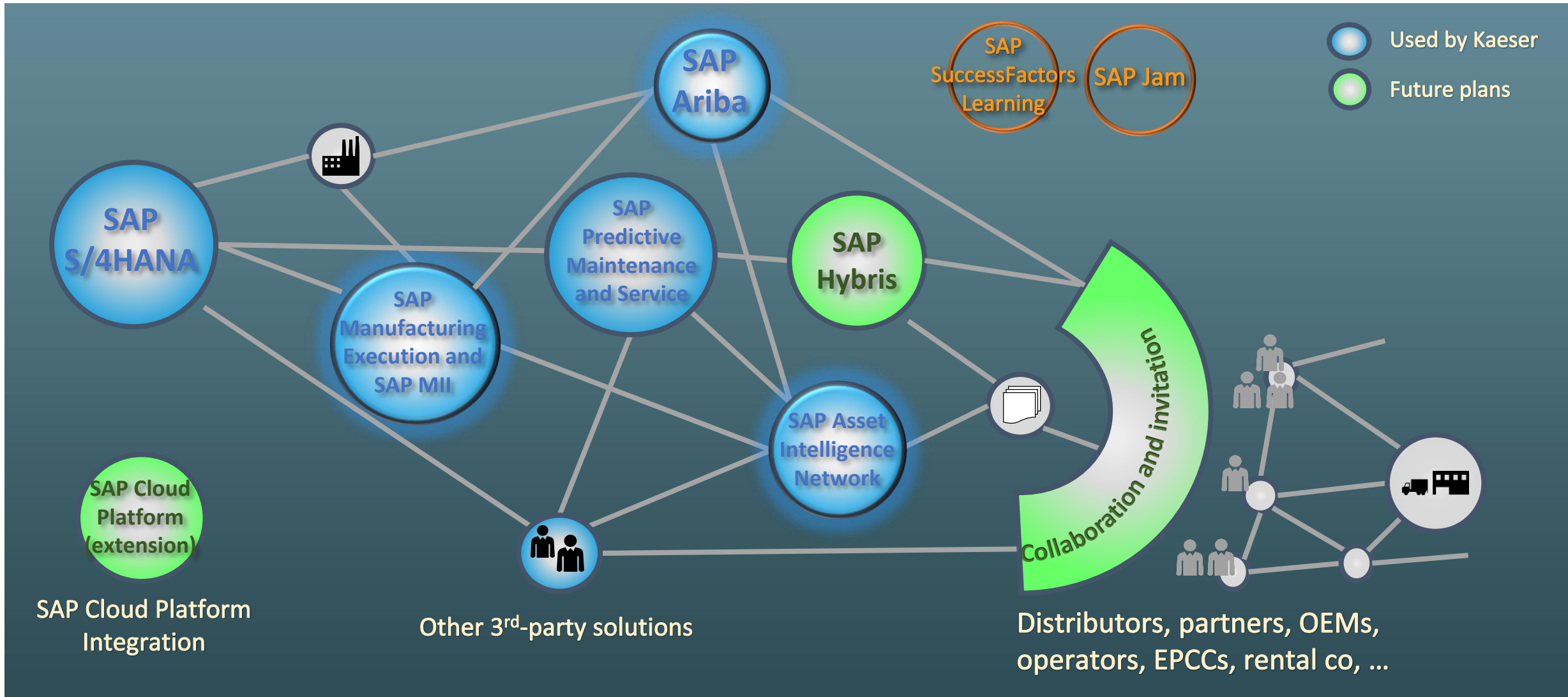
- Machine fingerprint, installation certification, ...



KAESER smart asset management



Connect the dots and go for operational excellence



Network of digital twins to drive business outcomes



Progressive products – based on trends, requirements, configurations, and collaboration



New services – aligned to customer need, industry value, and operational expectations



Opportunity expansion – new products, new services, new industries

Thank you.

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