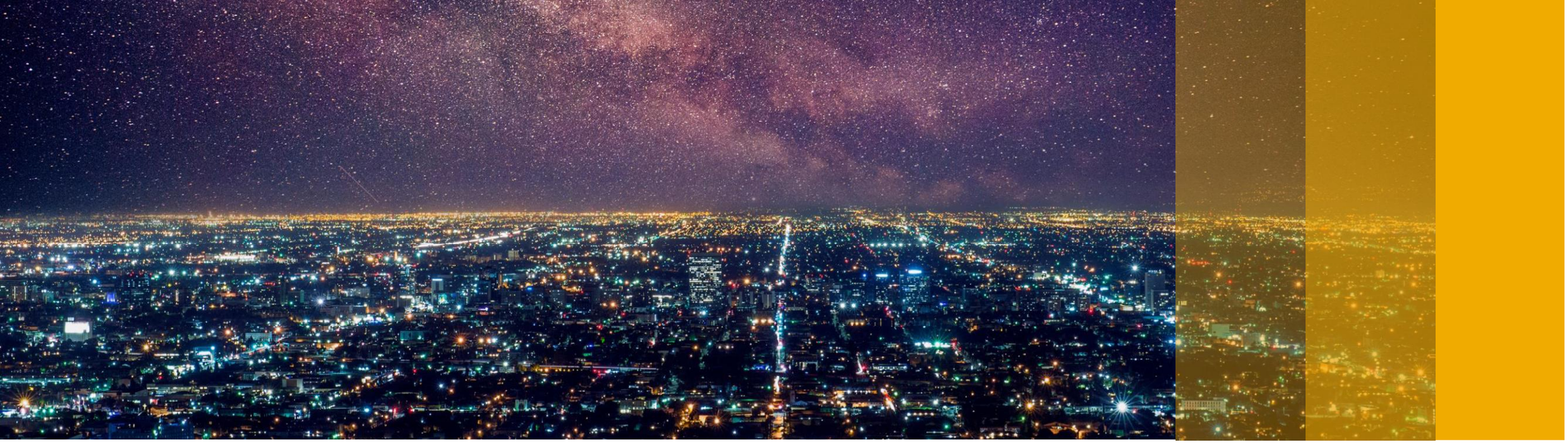

# SAP Leonardo IOT

Rakesh Gandhi – SAP Leonardo IoT GTM
Ken Pierce - SAP Leonardo IoT GTM

CUSTOMER

SAP Run Simple

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# Agenda

- Enterprise IoT – Overview and Trends
- SAP Leonardo IoT – Deep Dive
- Q&A

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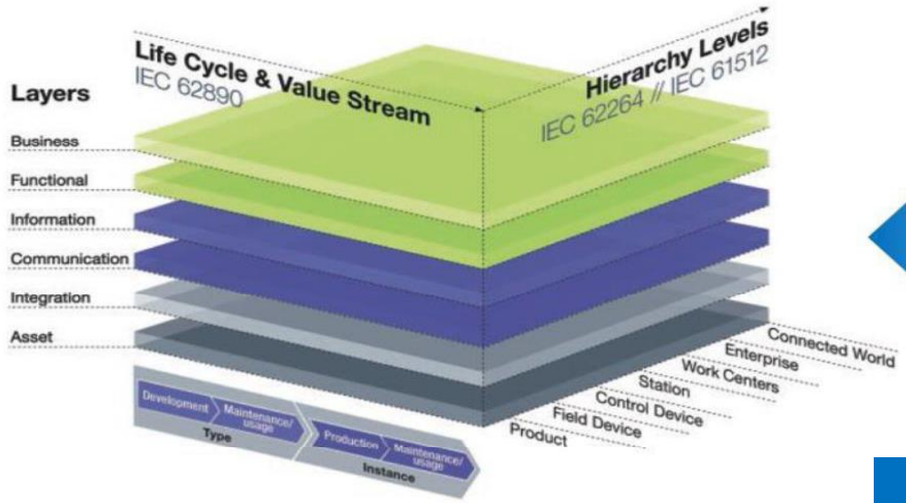
# Market Place – Emerging Trends

## Industrial Internet of Things

RAMI 4.0 INDUSTRIE 4.0

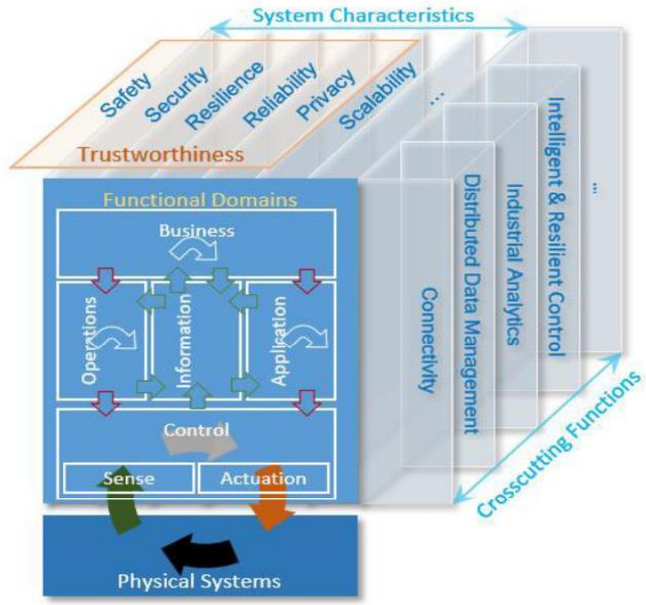



Standard Based e.g. ISA 95…

**Interoperability**

Platform Services, Connectivity, data management & Integration enables full interoperability…

IIRA Industrial Internet Consortium




Drive new outcomes

**Image Source: Industrial Internet Consortium – Whitepaper Dated: 2017 Dec'5**

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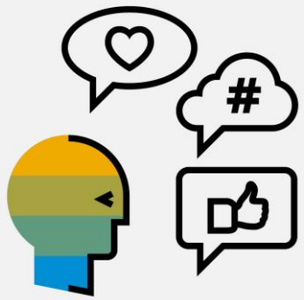
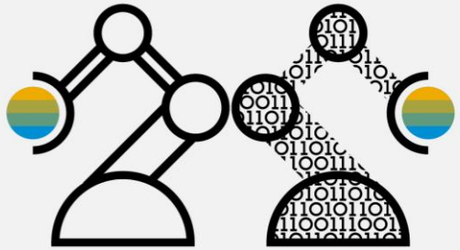
# IIoT Enabled Digital Transformation – SEGMENT OF ONE

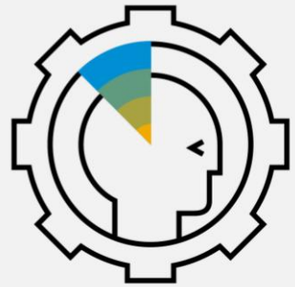
Four strategy elements



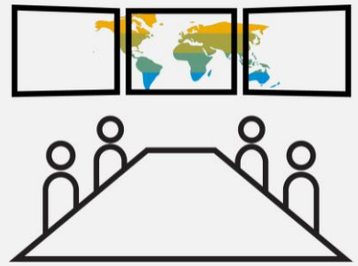
**CUSTOMER CENTRICITY**



**PREDICTIVE BUSINESS**



**SMART AUTOMATION**



**TOTAL VISIBILITY to OUTCOMES**

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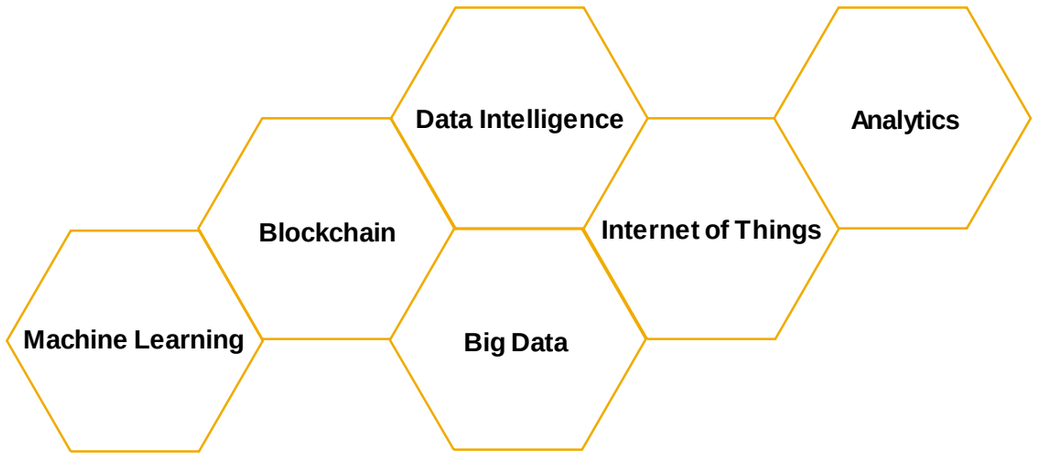
# SAP Leonardo

Infuse technology into business processes to achieve breakthrough results

**Design Led Innovation**

Solution Ideation & Vision → Rapid Prototyping → Integration Blueprint → Business Case Development

**SAP Leonardo Technologies and applications**




**SAP Cloud Platform**

Microservices | Open APIs | Flexible Runtimes | Integration

**Data Management**

SAP HANA | SAP Data Hub | SAP Vora | Other SAP | Open Source Storages | AWS S3, SWIFT, Hadoop, …

**Multi-Cloud Infrastructure**

SAP, Google Cloud Platform, Microsoft Azure, amazon web services

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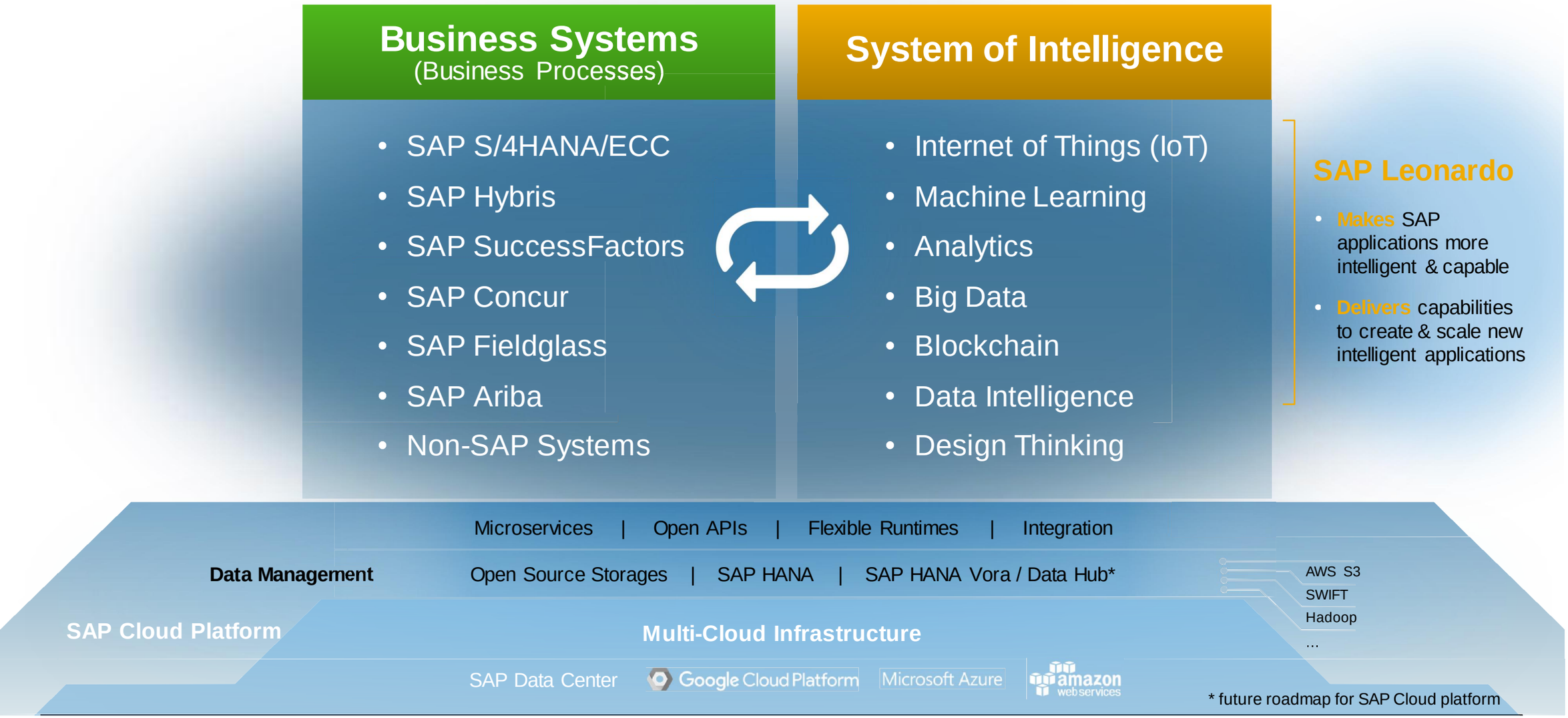
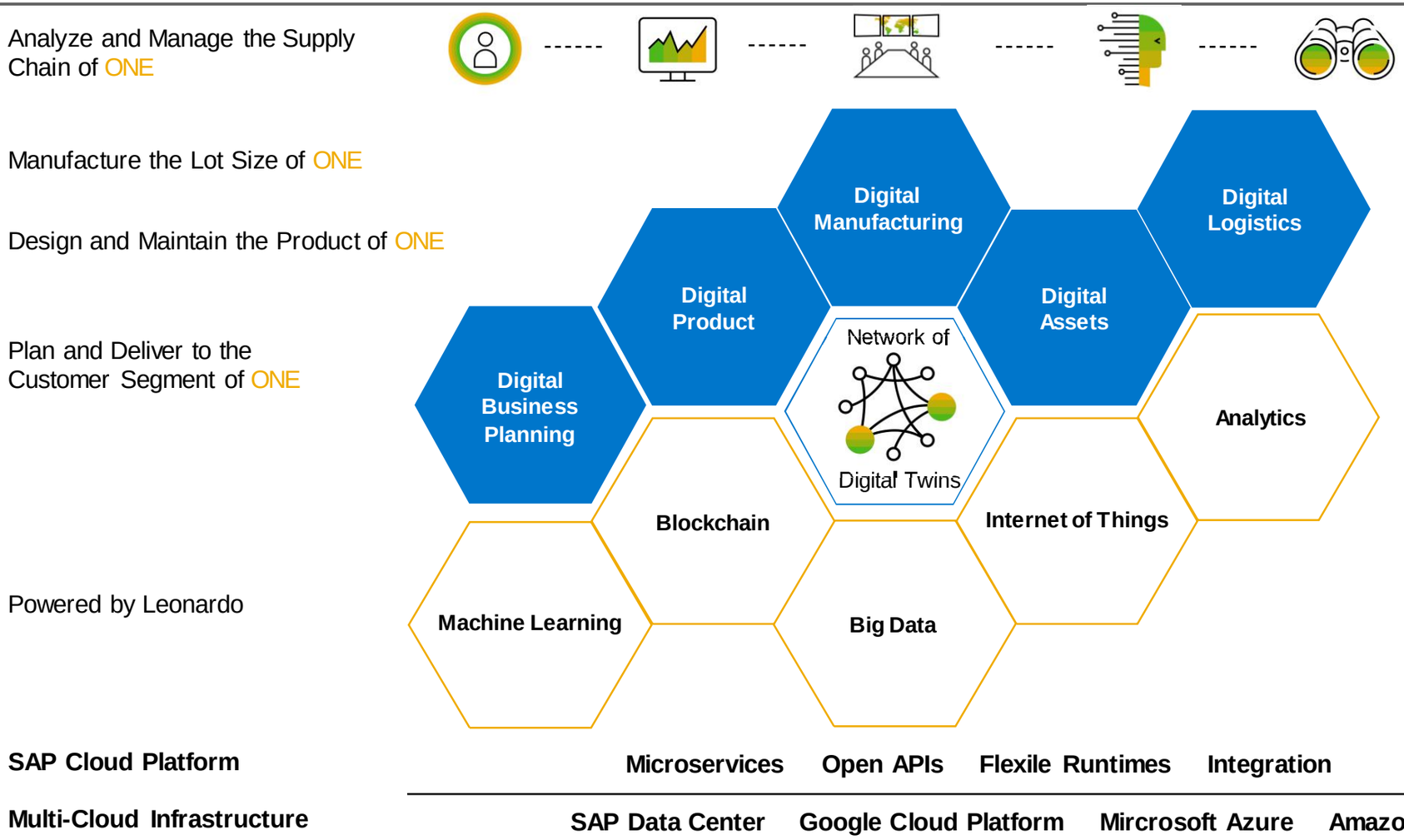
# SAP Leonardo: Virtuous cycle of innovation



# The Intelligent Digital Supply Chain of One

## Powered by SAP Leonardo

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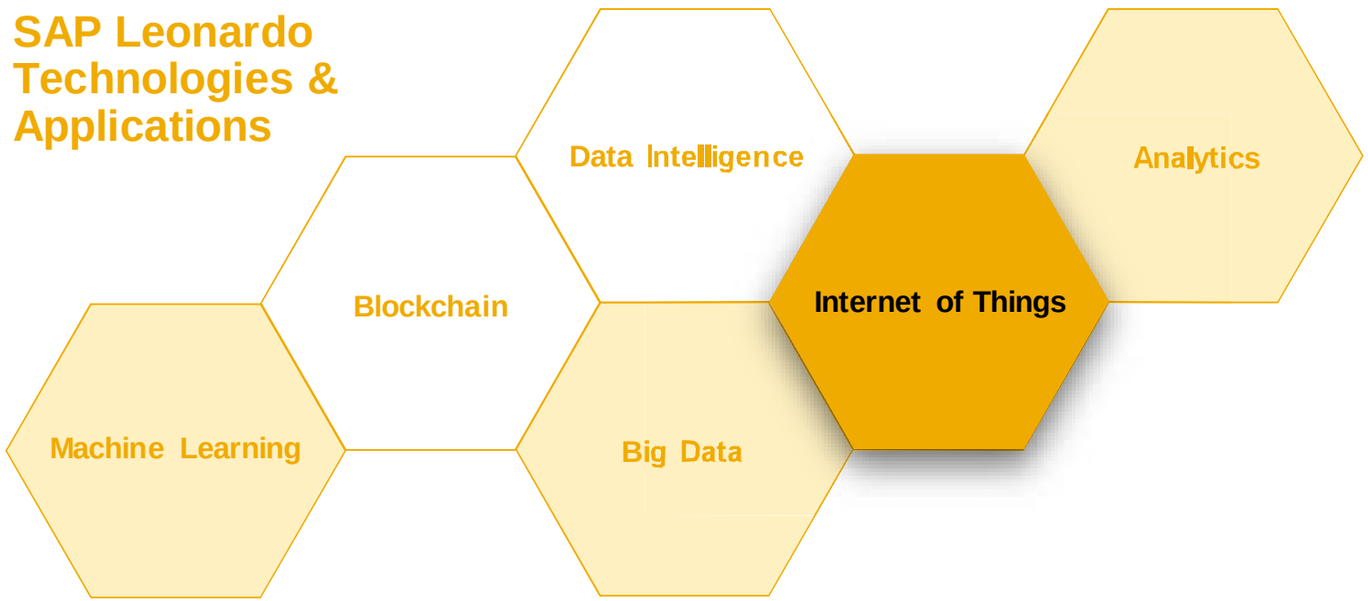
# SAP Leonardo

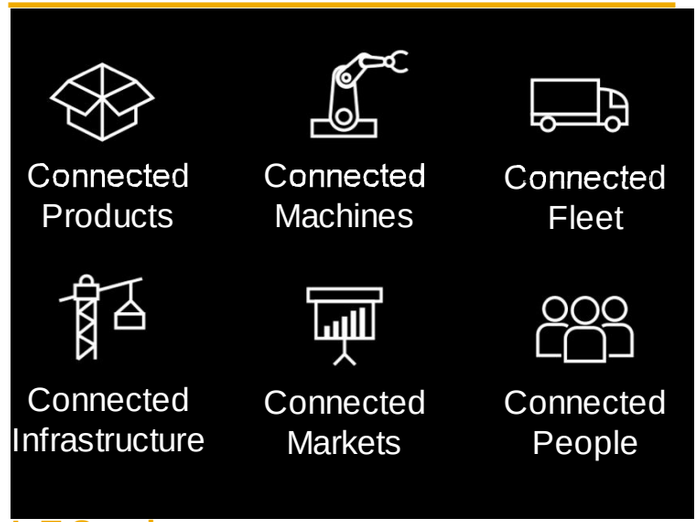
## SAP Leonardo Technologies & Applications




## SAP Leonardo Bridge

- Integrated & extendable suite
- Real-time view of connected things
- Built on business processes

## IoT Applications




## IoT Services

- Edge Services
- App Enablement/Digital Twin
- Thing management

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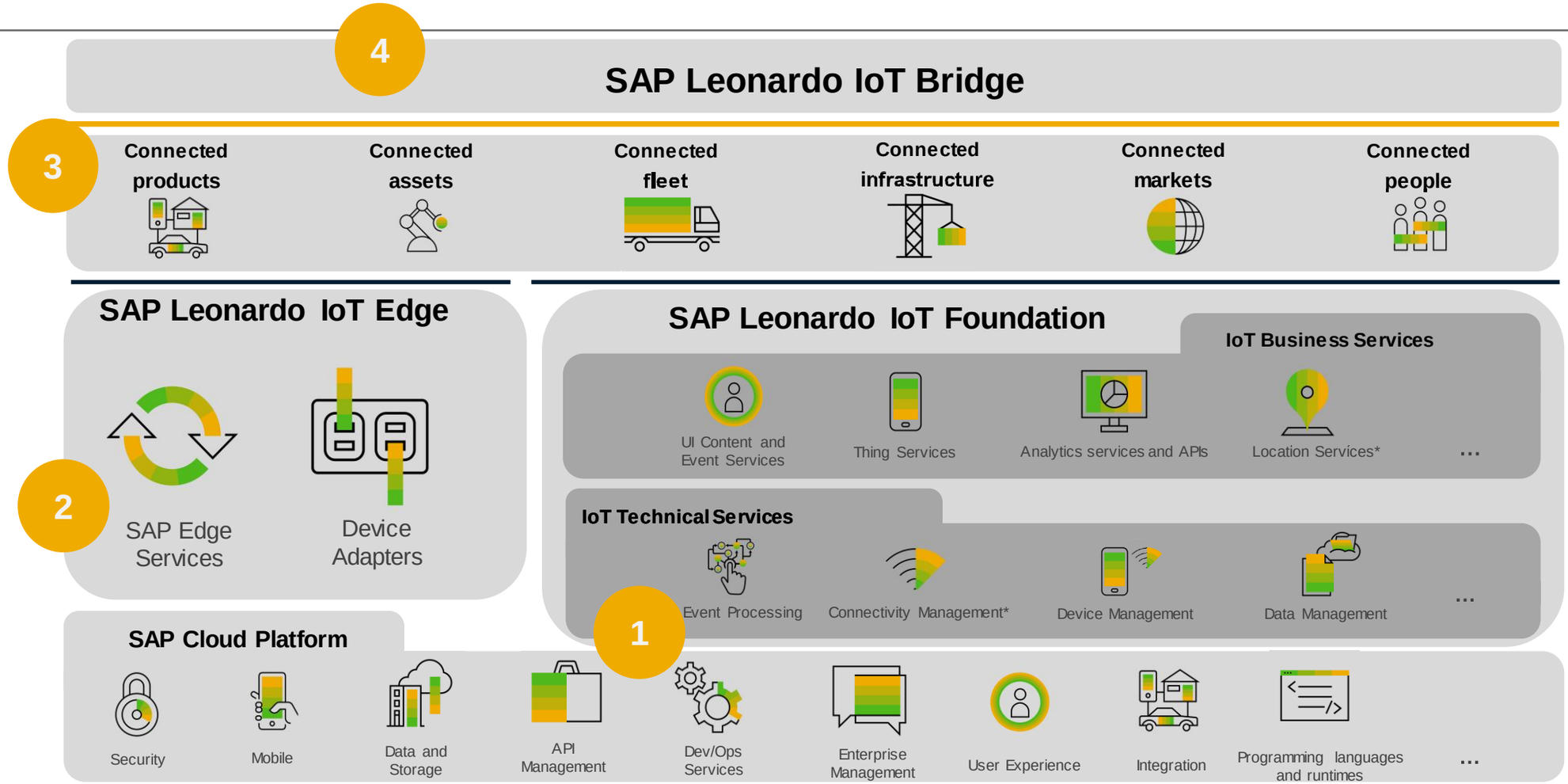
# SAP Leonardo IoT – E2E Solutions

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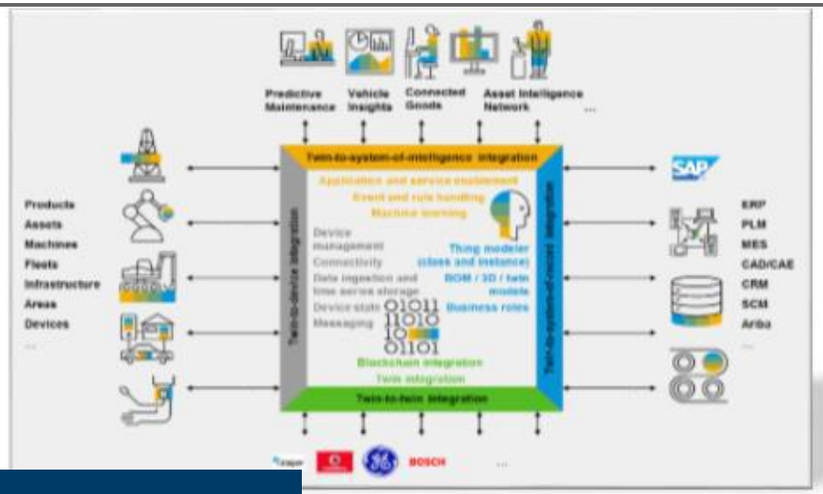
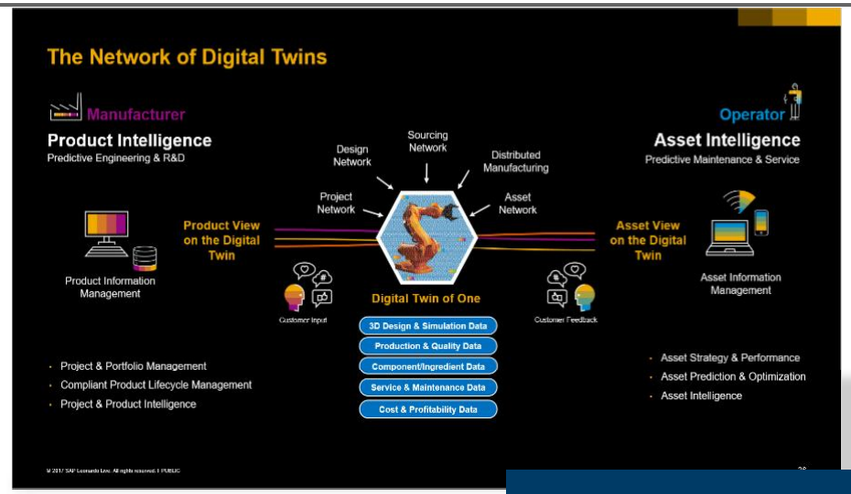
# Network of Digital Twins




DT Interfaces




Network of DTs

Physics-based DT

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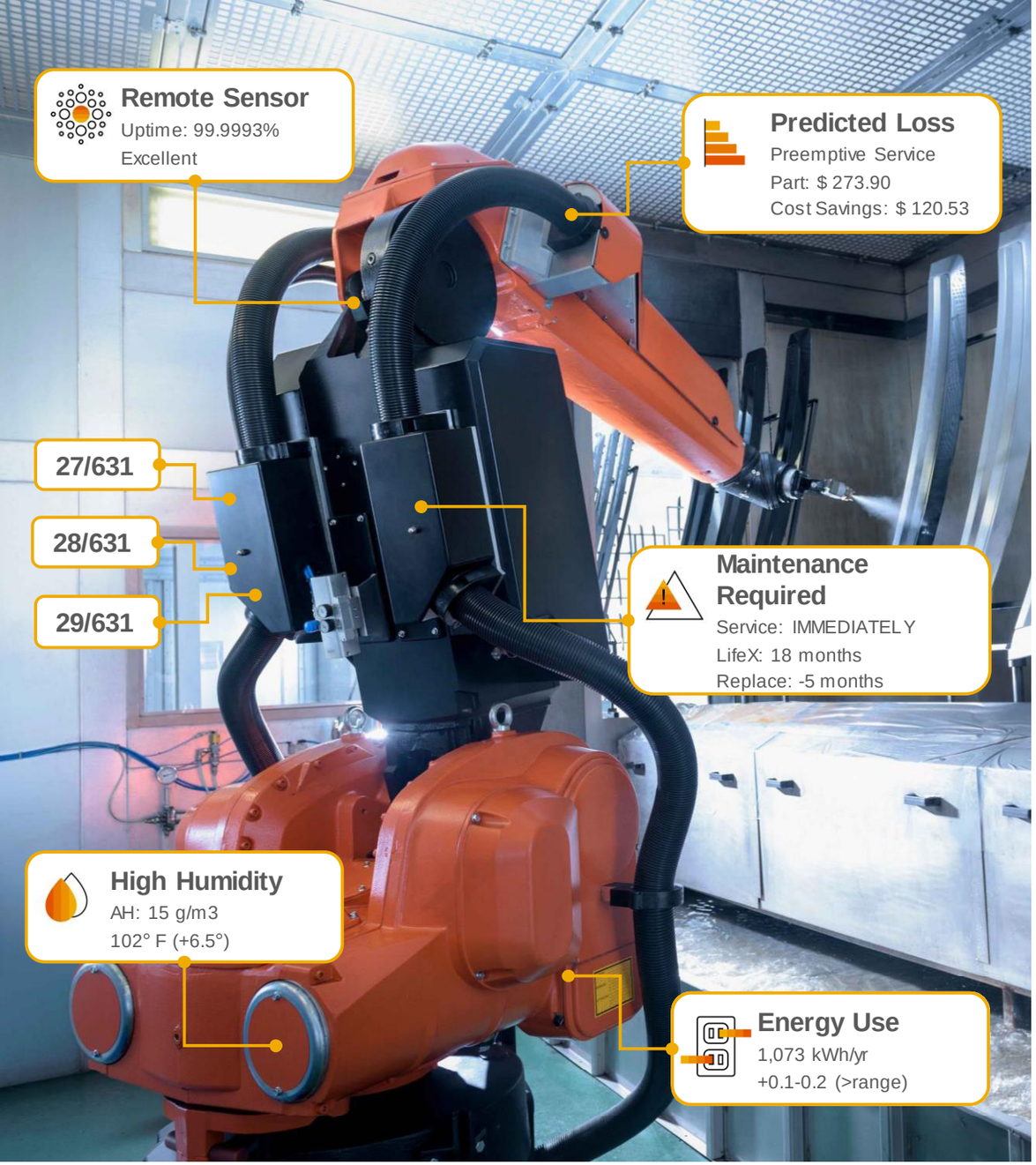
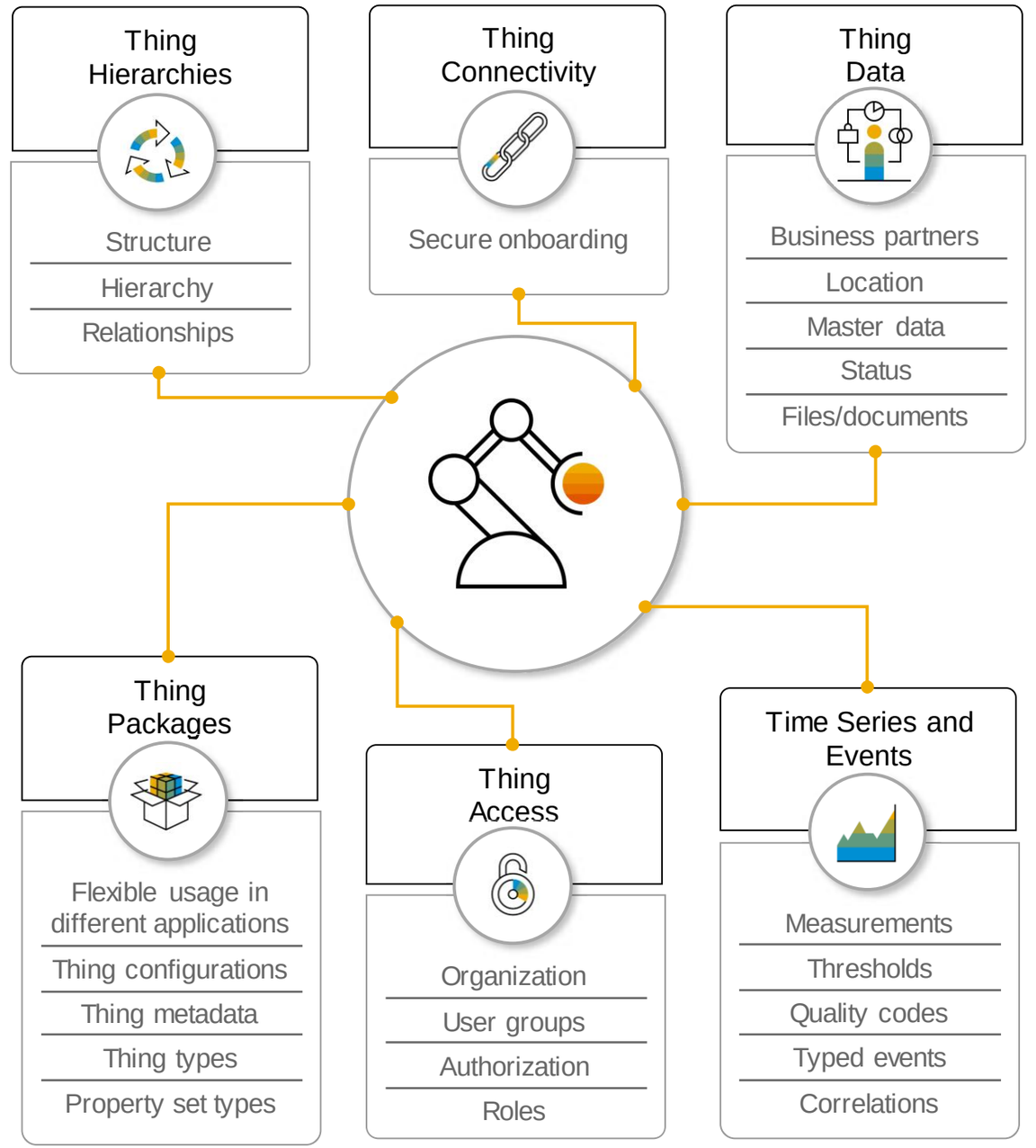
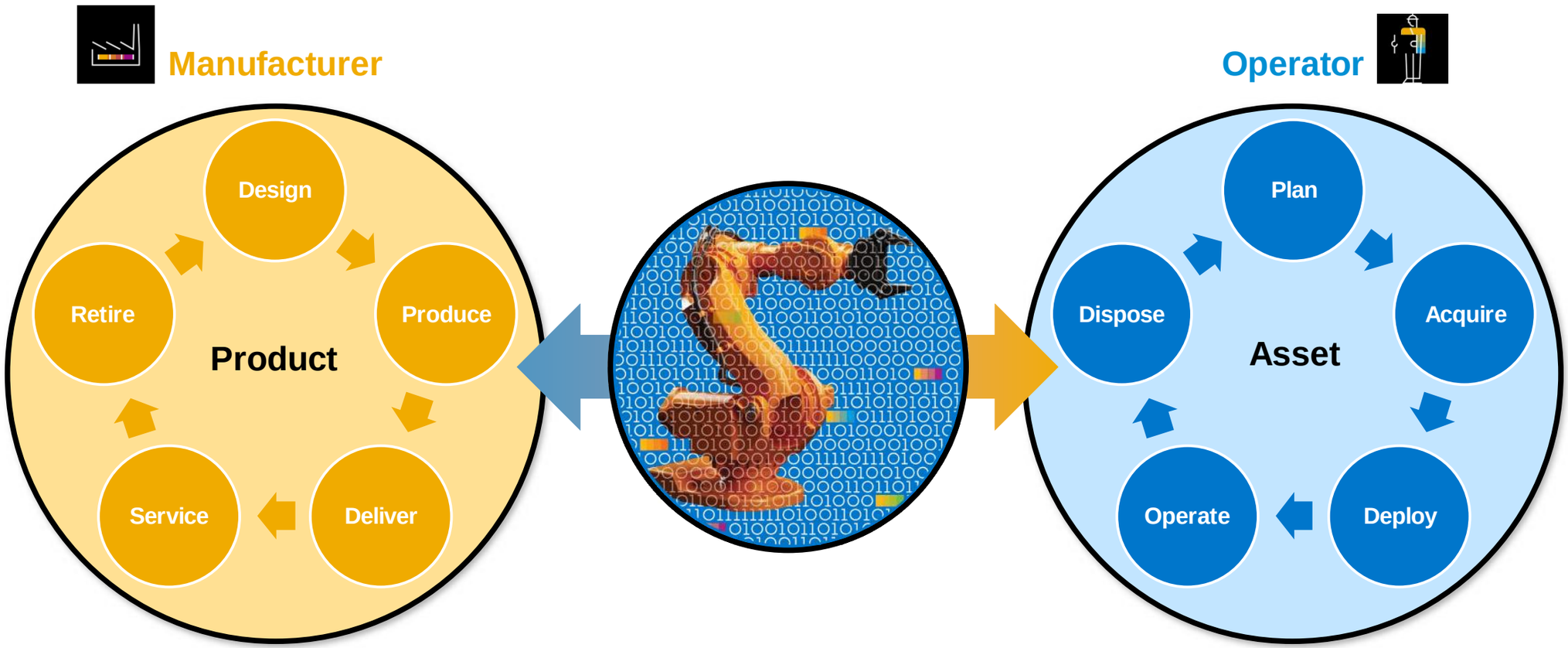

Remote Sensor
Uptime: 99.9993%
Excellent
Predicted Loss
Preemptive Service
Part: $ 273.90
Cost Savings: $ 120.53
27/631
28/631
29/631
Maintenance Required
Service: IMMEDIATELY
LifeX: 18 months
Replace: -5 months
High Humidity
AH: 15 g/m3
102° F (+6.5°)
Energy Use
1,073 kWh/yr
+0.1-0.2 (>range)


Thing Hierarchies
Structure
Hierarchy
Relationships
Thing Connectivity
Secure onboarding
Thing Data
Business partners
Location
Master data
Status
Files/documents
Thing Packages
Flexible usage in different applications
Thing configurations
Thing metadata
Thing types
Property set types
Thing Access
Organization
User groups
Authorization
Roles
Time Series and Events
Measurements
Thresholds
Quality codes
Typed events
Correlations

# Digital twin transforms the collaboration between manufacturers of products and operators of assets

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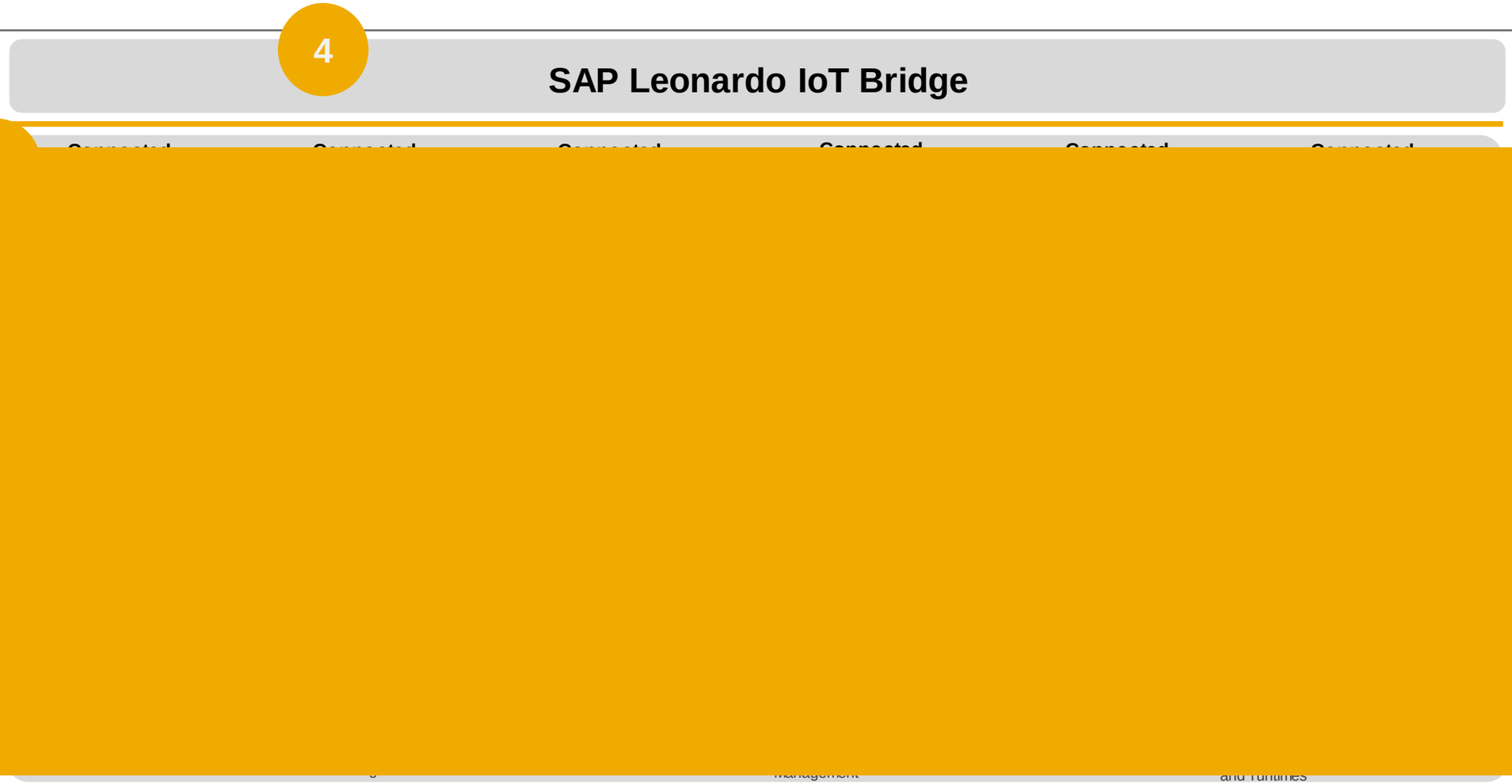
# SAP Leonardo IoT – E2E Solutions

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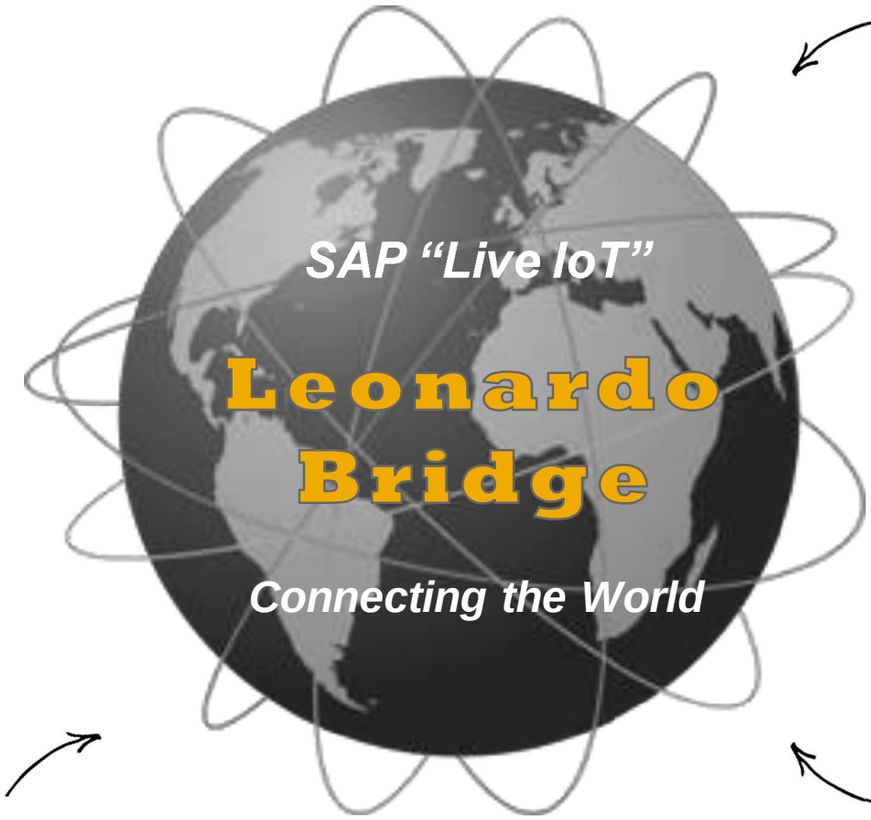
# SAP Leonardo IoT Bridge

*Connecting the World*




**Live Business**

**Connected Partners**
Customers, Suppliers,
Logistics Service Providers

**Connected People**
Customers, Vendors,
Partners, Social Networks

**Connected Things**
Products, Moving Assets, Fixed Assets,
Robots, Drones

**Connected Environment**
Weather, Traffic, News, Maps,
Regulations

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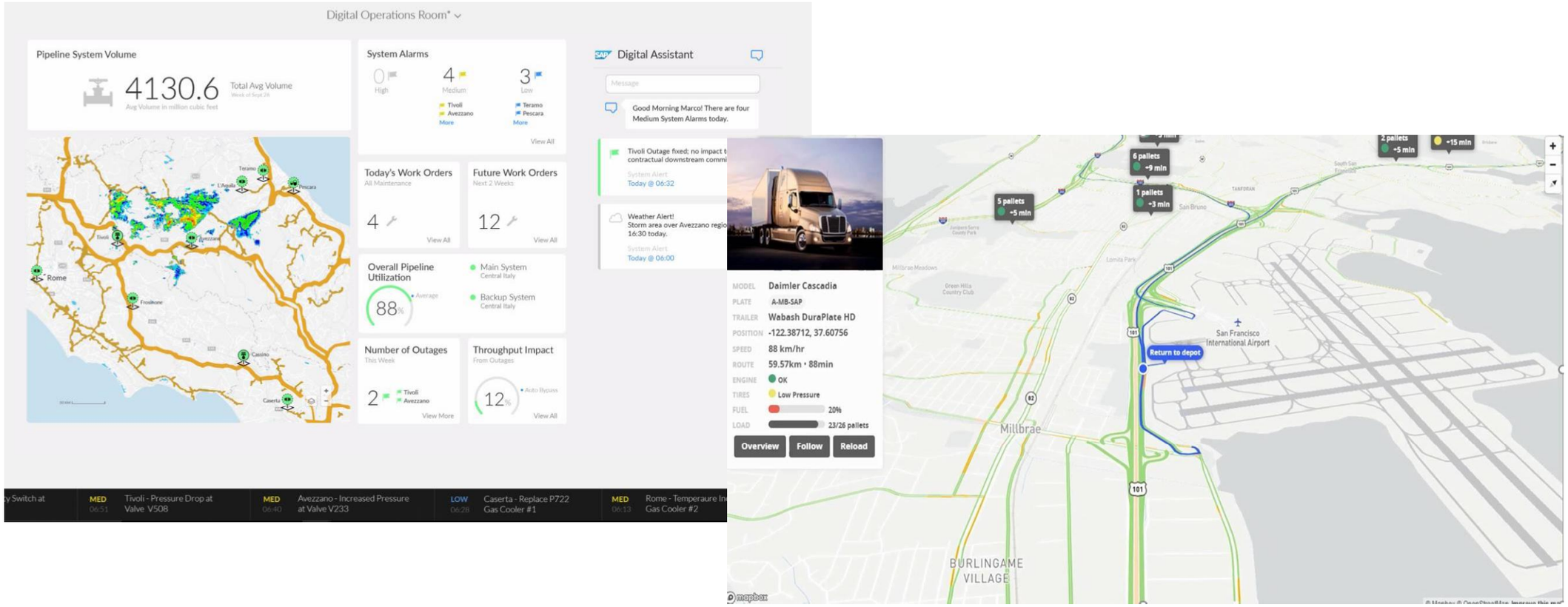
# SAP Leonardo – E2E Integrated Business Processes

## Digital Operations Room / Connected Delivery Fleet

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# SAP Leonardo IoT – E2E Solutions

3

Connected products

Connected assets

Connected fleet

Connected infrastructure

Connected markets

Connected people

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# SAP LEONARDO IOT Solutions at a glance

## SAP Leonardo IoT Bridge

| Connected product | Connected assets | Connected fleet | Connected infrastructure | Connected markets | Connected people | Customer /Partner applications |
|---|---|---|---|---|---|---|
| | | | | | | |
| **SAP Connected Goods**<br>**SAP Intelligent Product Design** | SAP Predictive Maintenance and Service<br>SAP Predictive Quality*<br>SAP Predictive Engineering *<br>SAP Asset Intelligence Network<br>Manufacturing Intelligence & Insights<br>Digital Manufacturing Insights<br>SAP Distrubuted Manufacturing | SAP Vehicle Insights<br>SAP Global Track and Trace<br>SAP Logistics Business Network* | SAP Predictive Maintenance & Service for utilities<br>SAP Predictive Engineering<br>SAP Asset Intelligence Network | SAP PdMS for utilities<br>SAP Predictive Engineering<br>SAP Smart Traffic*<br>SAP Connected Agribusiness | SAP Worker Safety<br>…… | Partner Solutions<br>…… |

* Future

…Connects things with people and processes

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# SAP IoT for Connected Products

January 2018

SAP Run Simple

# SAP Connected Goods | From Things to Outcomes

## From Things…

Containers

Silos

Tools

Medical Devices

Coolers

Vending Machines

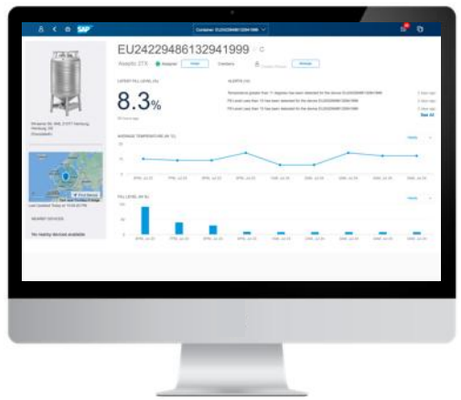
*and many more…*

**Sensor Information**

WIFI Sensor

GSM Sensor

BLE Sensor




**SAP Connected Goods**

- Real-time tracking of inventory and consumption rate
- Vendor Managed Inventory
- Track asset position
- Replenishment of goods
- Spoilage Prevention / Product Quality

## …to Outcomes

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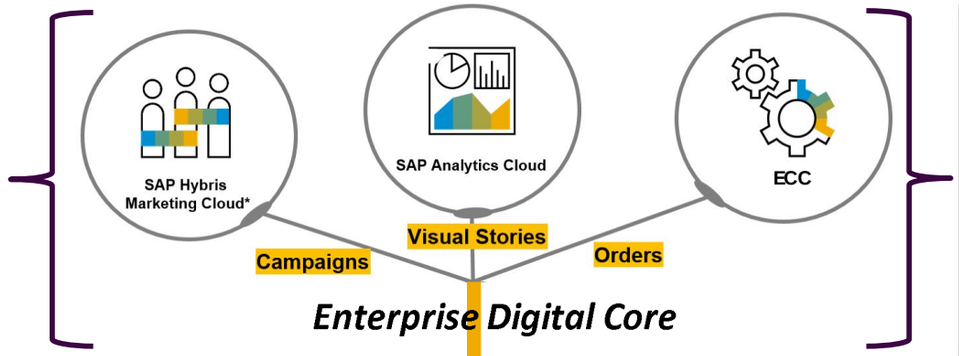
# SAP Connected Goods | Connecting Extended Enterprise Edge to Digital Core Discovering the Value Scenarios at Your Customers

## Customer Interaction Monitoring*

- Validate marketing campaign effectiveness
- Optimize placement across regions and in stores
- Monitor sales performance and calculate ROI

* Planned Innovation




## Inventory Monitoring

- Low stock and out of stock alerts for smooth replenishment
- Forecast availability of vendor managed inventory
- Maximize customer satisfaction by ensuring availability of stock

## Product Monitoring

- Optimize product storage conditions
- Monitoring of product consumption rate
- Dynamically change product expiration date

## Operational Monitoring

- Maximize utilization and number of “sale days”
- Automatically match location to known business partners
- Location monitoring to prevent unauthorized movement

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# SAP Connected Goods | Customer Examples

## Optimize Connected Coolers

**Customer Profile**
Industry: Consumer Goods
Company: Beverage Producers

### Business Drivers

- Maximize sales with fast inventory replenishment
- Place coolers in highest yielding locations
- Reduce product spoilage
- Increase customer satisfaction by delivering a consistent experience
- Reduce losses due to cooler theft

### Capabilities

- Enable real-time inventory replenishment
- Geo-location monitoring
- Optimal beverage storage condition monitoring
- Insights to determine optimal cooler location
- Real-time beverage consumption insights

### Outcome

- LIVE with SAP Connected Goods in March 2017
- More selling moments per cooler per year as a result

## Optimize Usage, Monitoring and Traceability of Construction Tools

**Customer Profile**
Industry: Engineering & Construction
Company: Tool Manufacturer/Construction companies

### Business Drivers

- Create new business model of Pay Per Use (“as a Service”)
- Reduce the use of non-certified drilling heads by customers
- Reduce lost or stolen equipment on construction sites
- Automate the dispatch of construction tools from central warehouses

### Capabilities

- Monitor tool usage to enable pay-per-use
- Remotely block stolen or missed tools
- Geo-location monitoring
- Validate delivery of the correct tool to remote sites

### Benefits

- Achieve real-time transparency on last-known locations of assets
- Support geo-fencing based alerts and notifications
- Enable immediate investigation for lost assets using location history
- Receive low-battery alerts for in-use assets

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# SAP Leonardo IoT Connected Assets

January 2018

Run Simple

# Connected Assets

- Connect, monitor and tightly control manufacturing equipment
- Optimize manufacturing, product quality, and asset performance throughout its lifecycle
- Manage a network of assets to identify and resolve issues before they happen

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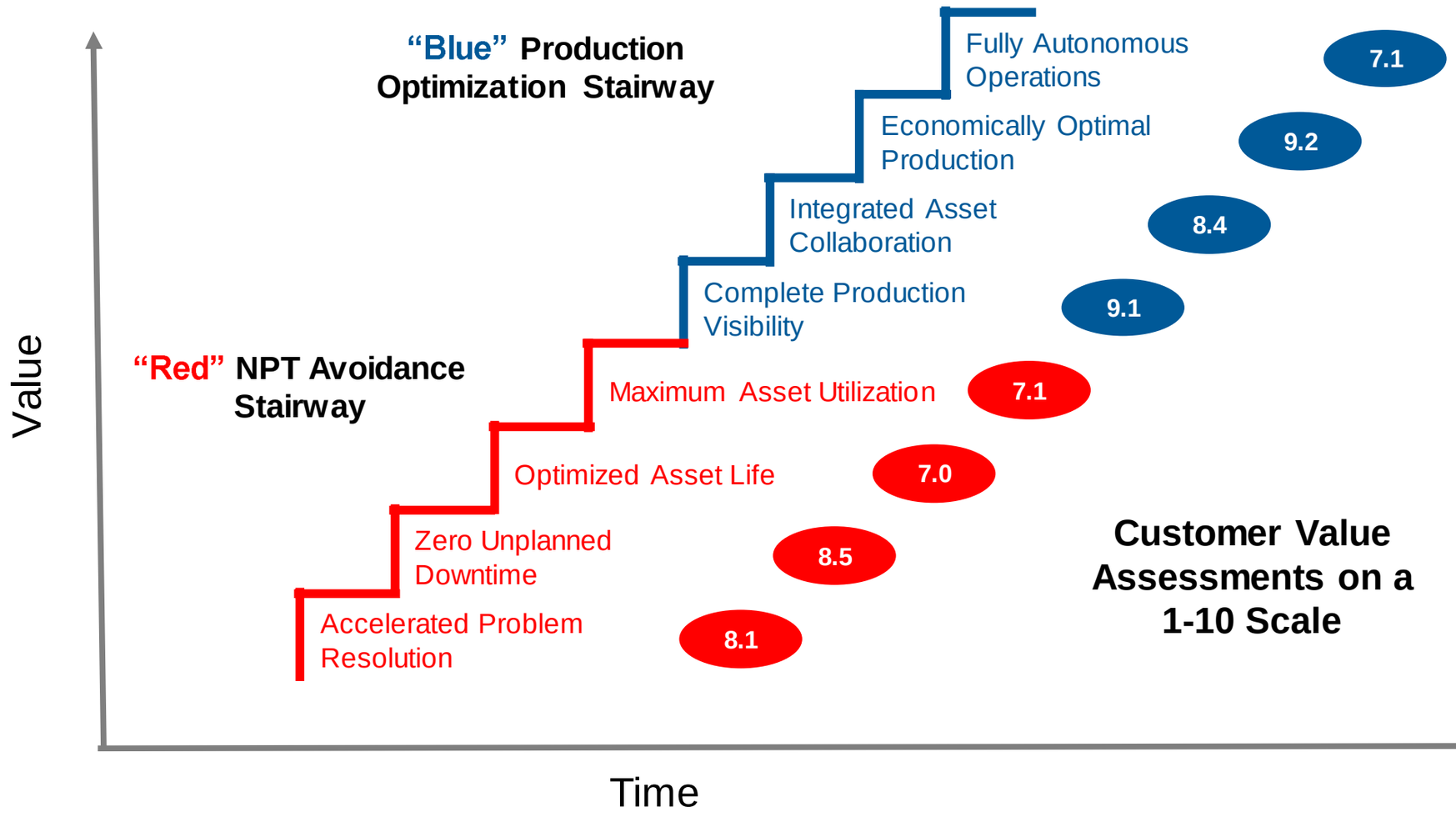
# SAP Leonardo for IOT - Connected Asset

## The Journey to Capitalizing on Value

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# SAP LEONARDO IOT Solutions for Connected Assets

| Connected product | Connected assets | Connected fleet | Connected infrastructure | Connected markets | Connected people | Customer /Partner applications |
|---|---|---|---|---|---|---|
| | | | | | | |
| SAP Connected Goods<br>SAP Intelligent Product Design | **SAP Predictive Maintenance and Service**<br>**SAP Predictive Quality***<br>**SAP Predictive Engineering***<br>**SAP Asset Intelligence Network**<br>**Manufacturing Intelligence & Insights**<br>**Digital Manufacturing Insights**<br>**SAP Distrubuted Manufacturing** | SAP Vehicle Insights<br>SAP Global Track and Trace<br>SAP Logistics Business Network* | SAP Predictive Maintenance & Service for utilities<br>SAP Predictive Engineering<br>SAP Asset Intelligence Network | SAP PdMS for utilities<br>SAP Predictive Engineering<br>SAP Smart Traffic*<br>SAP Connected Agribusiness | SAP Worker Safety<br>…… | Partner Solutions<br>…… |

* Future

…Connects things with people and processes

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# SAP IoT for Fixed and Linear Assets

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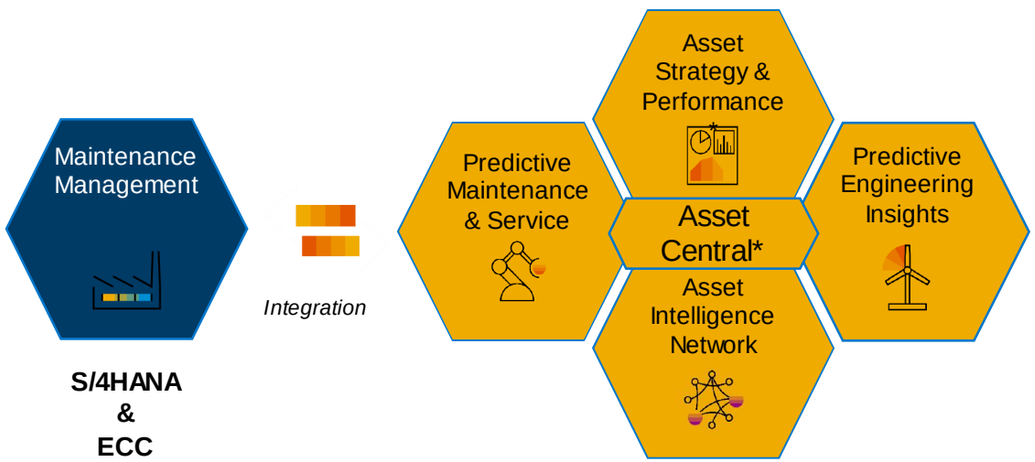
# SAP Leonardo IoT for Asset Management

## Enabling intelligent insights

**Digital Core: System of Record**

**Digital Innovation: System of Innovation**




*Planned

### An architecture built for next generation Enterprise Asset Management

**Digital Core**

Corrective, emergency and preventive maintenance **planning & execution** via notification and order processing in an integrated system

**Digital Innovation**

- **Asset Central –** Provides a re-usable asset registry across IoT applications for seamless integration and data consistency
- **SAP Asset Intelligence Network**
  **Collaborative** asset management bringing key stakeholders (operator, OEM, service providers, …) together in a digital ecosystem solving complex execution, predictive and planning activities with centrally managed asset information
- **SAP Predictive Maintenance and Service**
  Enables enhanced **predictive maintenance** techniques to optimize EAM business processes for greater asset availability and reduced cost
- **SAP Asset Strategy and Performance Management***
  Define and **plan** maintenance execution strategies holistically (insight/foresight; insights from network) for improved performance
- **SAP Predictive Engineering Insights**
  Model and visualize the **physical** structure of an asset for real-time calculation of stress and fatigue to drive predictions

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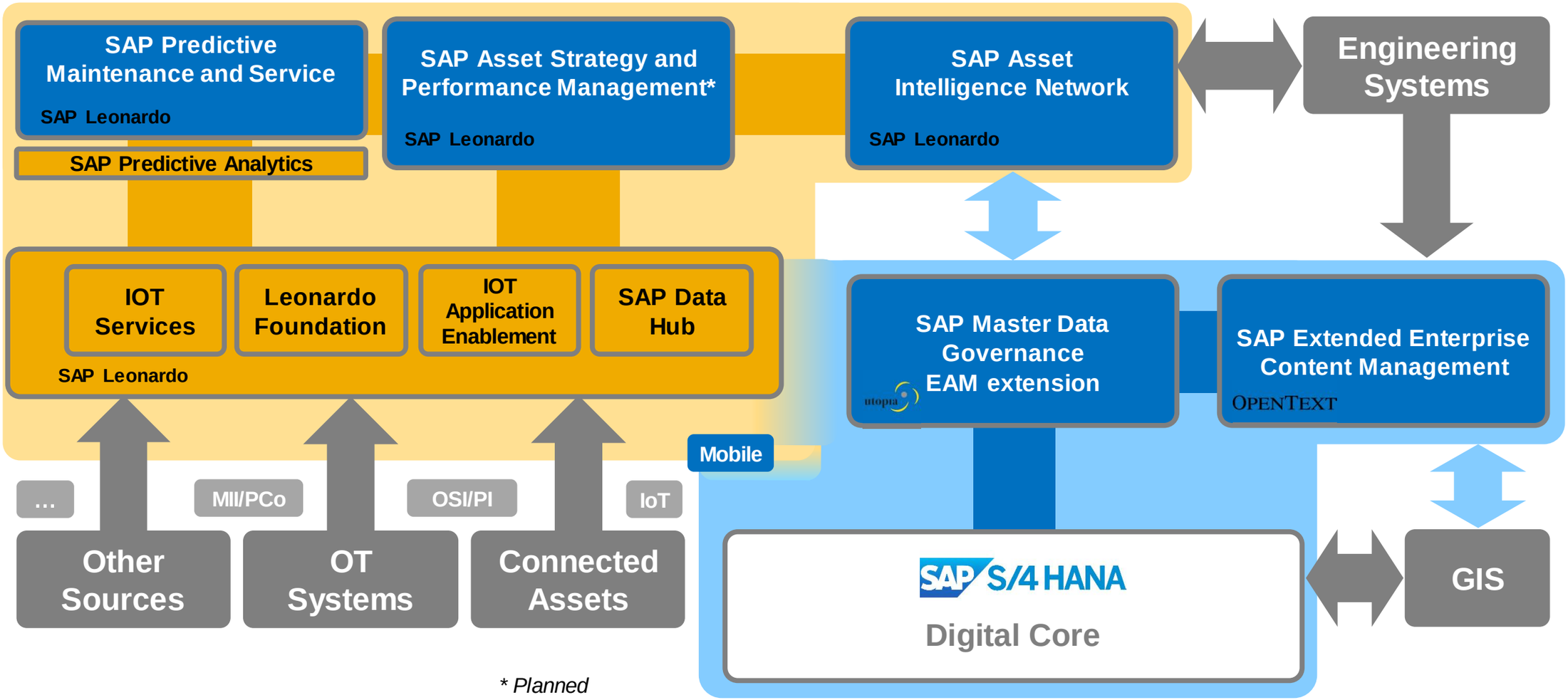
# IOT For Asset Management
## Overall System Architecture




** Planned*

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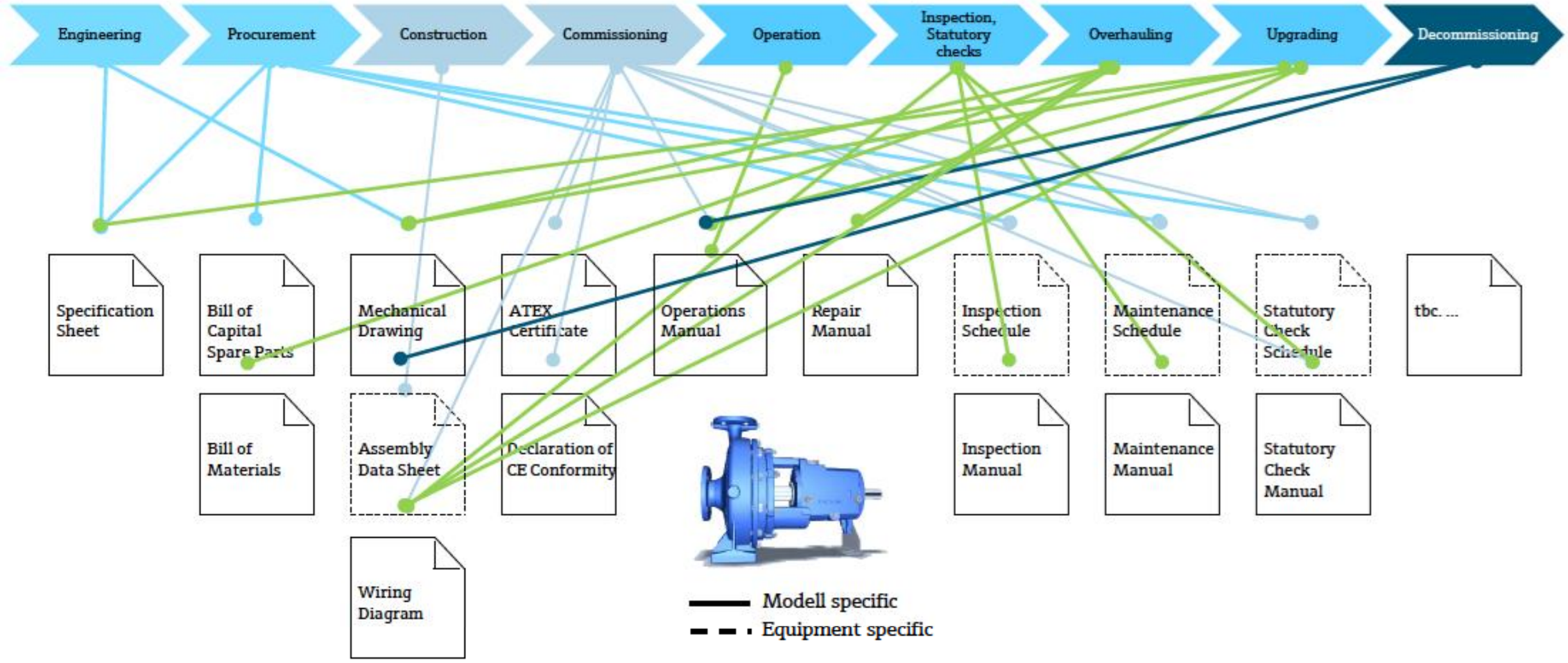
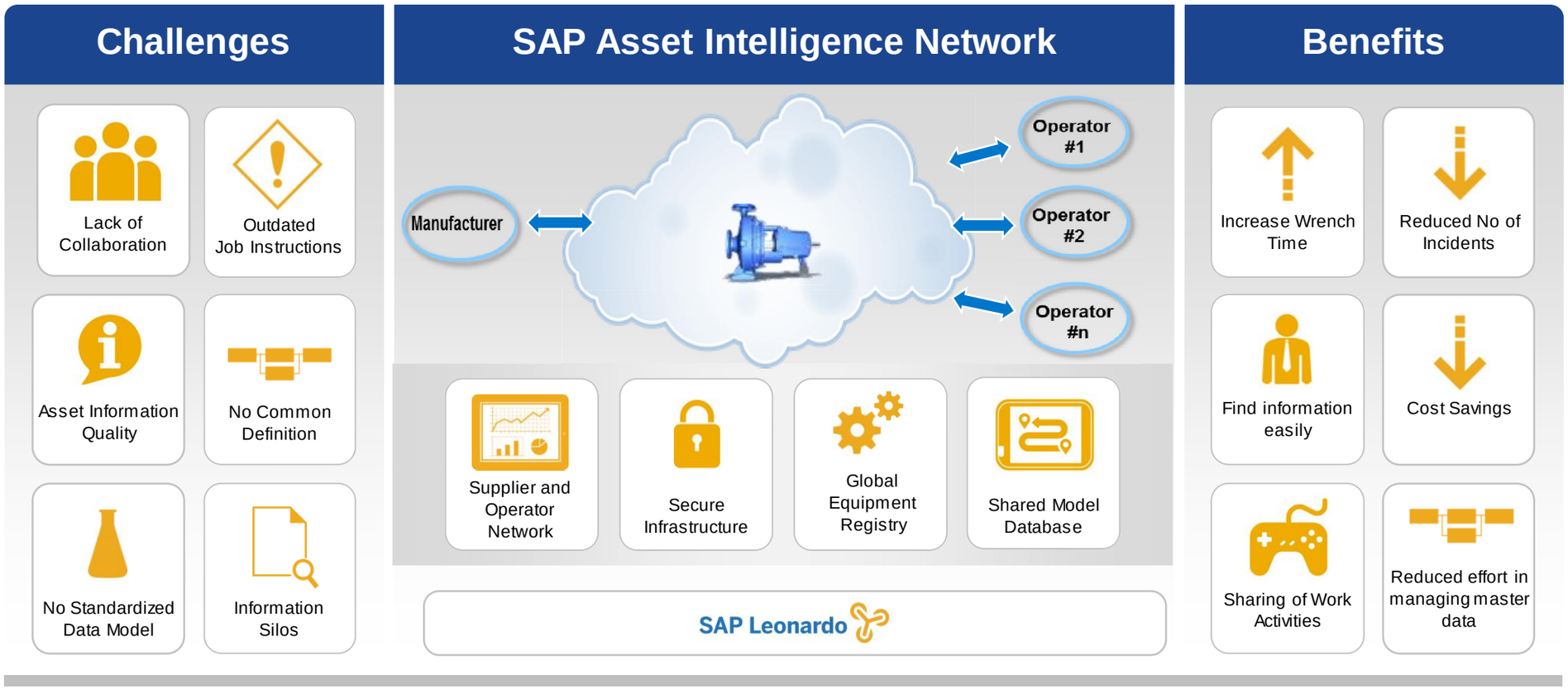
# Asset information Collaboration

# How often do you need Asset Information throughout an Assets Lifetime?



# Connected Asset Information Collaboration

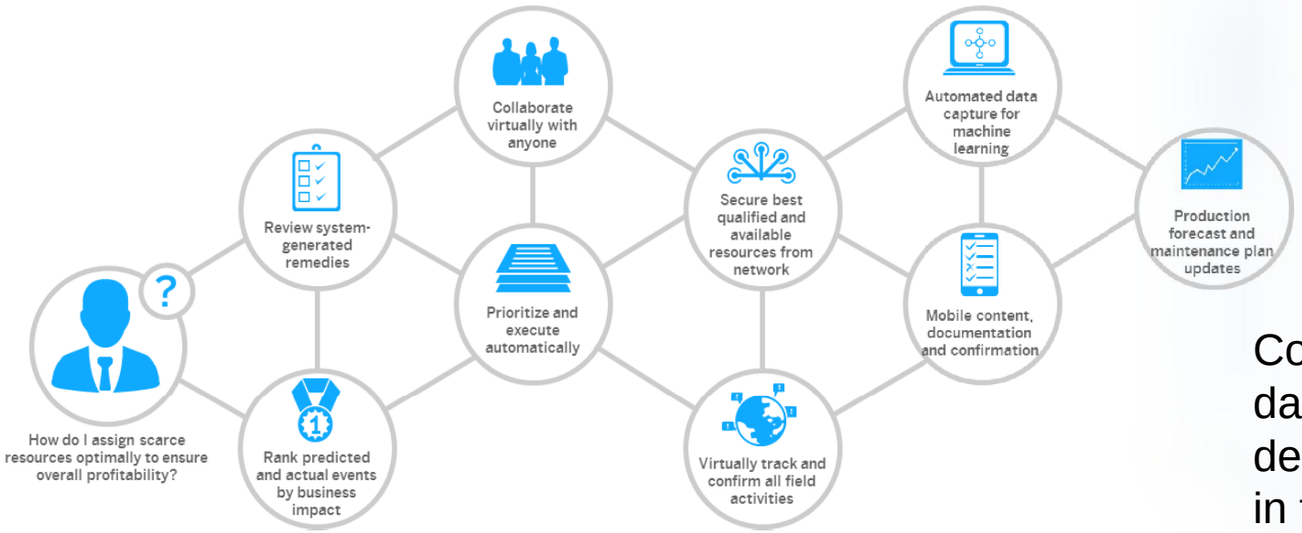
## SAP Asset Intelligence Network




**SAP Asset Intelligence Network, a network to bring together business partners**

# Optimize Asset Maintenance

## Predictive Maintenance & Services



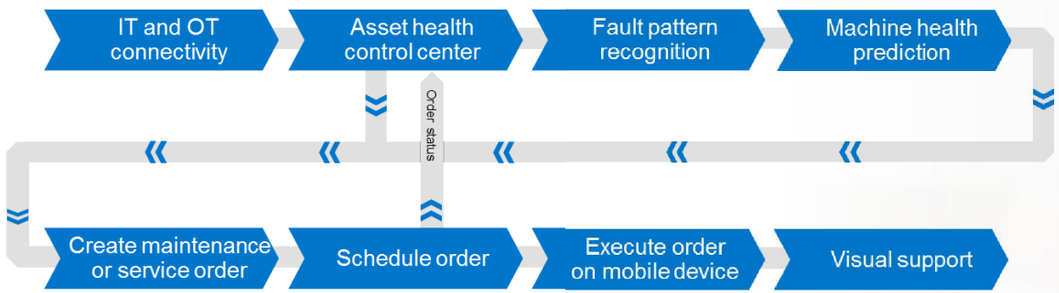

Combining asset, planning, and financial data, allows people to make better decisions based on a holistic understanding in the context of the work they perform.

### Predictive Maintenance and Service

Increase effectiveness with valuable insights from operational systems

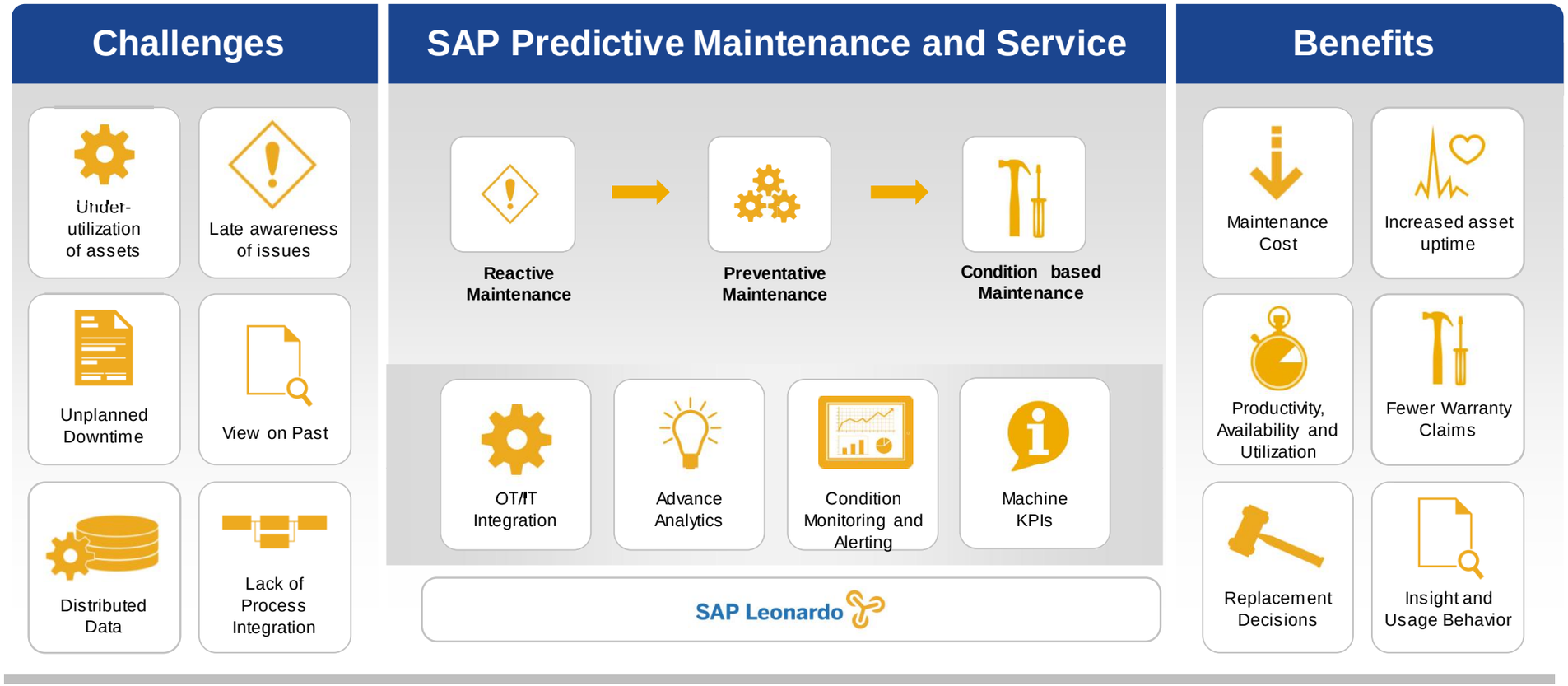
### Business Systems

Increase efficiency with business processes for maintenance and service



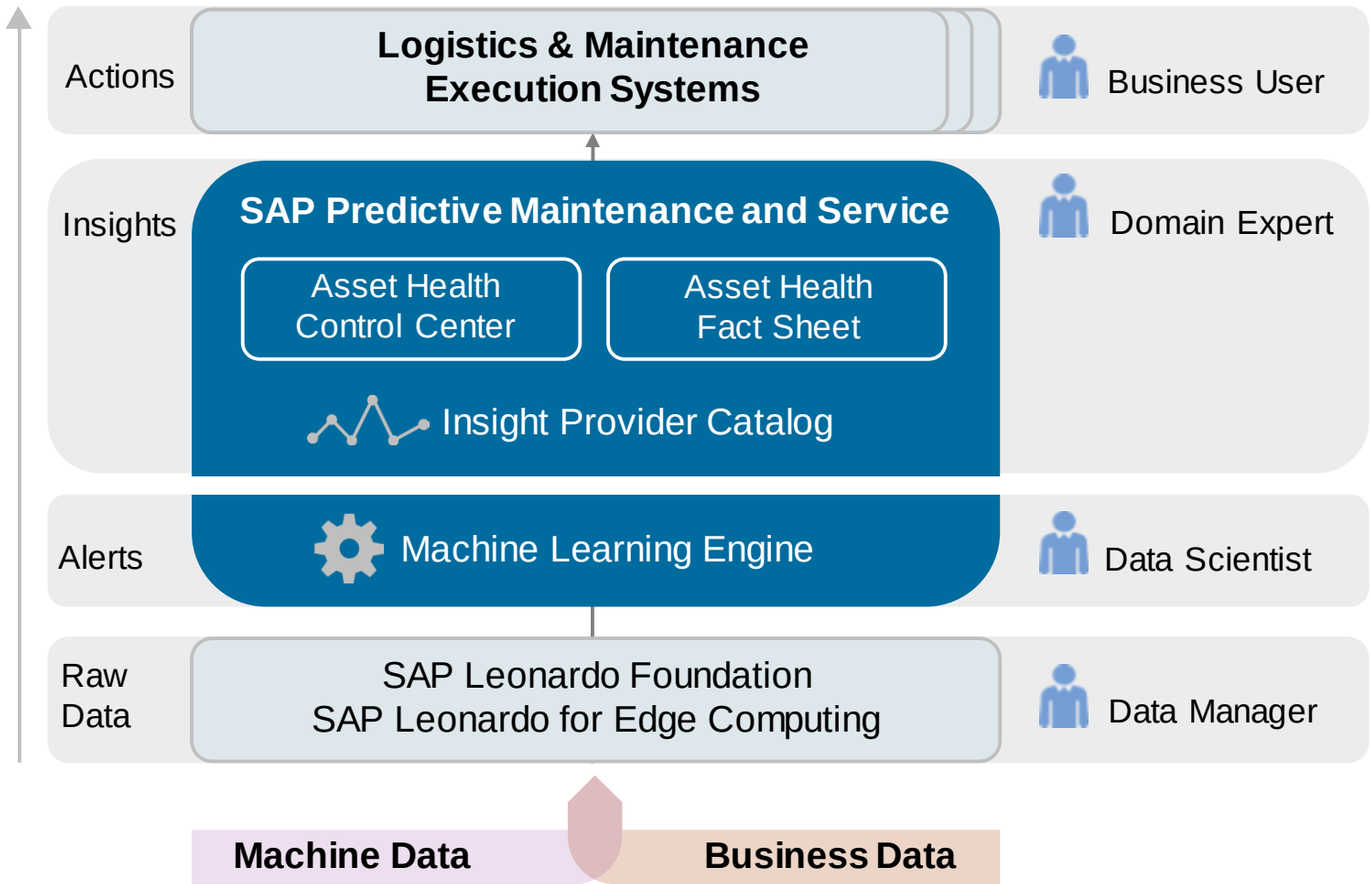
# Connected Maintenance

## SAP Predictive Maintenance and Service



# SAP Predictive Maintenance and Service

Solution components and value drivers




- Available via **cloud** or **on-premise**
- Flexible **extension concept** for customers to build industry or customer specific models and analytics
- A scalable **Machine Learning Engine** that drives data science insights into our business processes
- **Flexible visualizations** across equipment structures
- End-to-end process integration… **Alert, Discover, Remedy**

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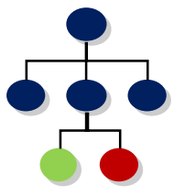
# Life Cycle of Machines and **Components**

## Operator



Installation

- Connectivity
- Comp. of asset structures
- Commissioning processes

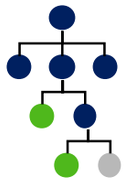
Operation

- Monitoring/status
- Quality control
- Track and trace

Maintenance

- Maintenance
- Repair
- Spare parts

## Machine/Component Manufacturing



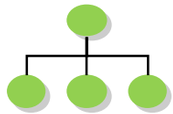
- Configuration and engineer-to-order process
- Track and trace across the entire life cycle of the system
- Monitoring of the system and increased availability thanks to optimized maintenance intervals
- Service and maintenance
- Software updates (depending on product group and application)

**Digital twin**

Asset structures

Machine data/sensor data/time series, and so on

## Supplier



- Tracking and tracing of products
- Warranty management
- Service/repair
- Documentation

## Service Providers

- Installation
- Commissioning
- Service/repair
- Spare parts

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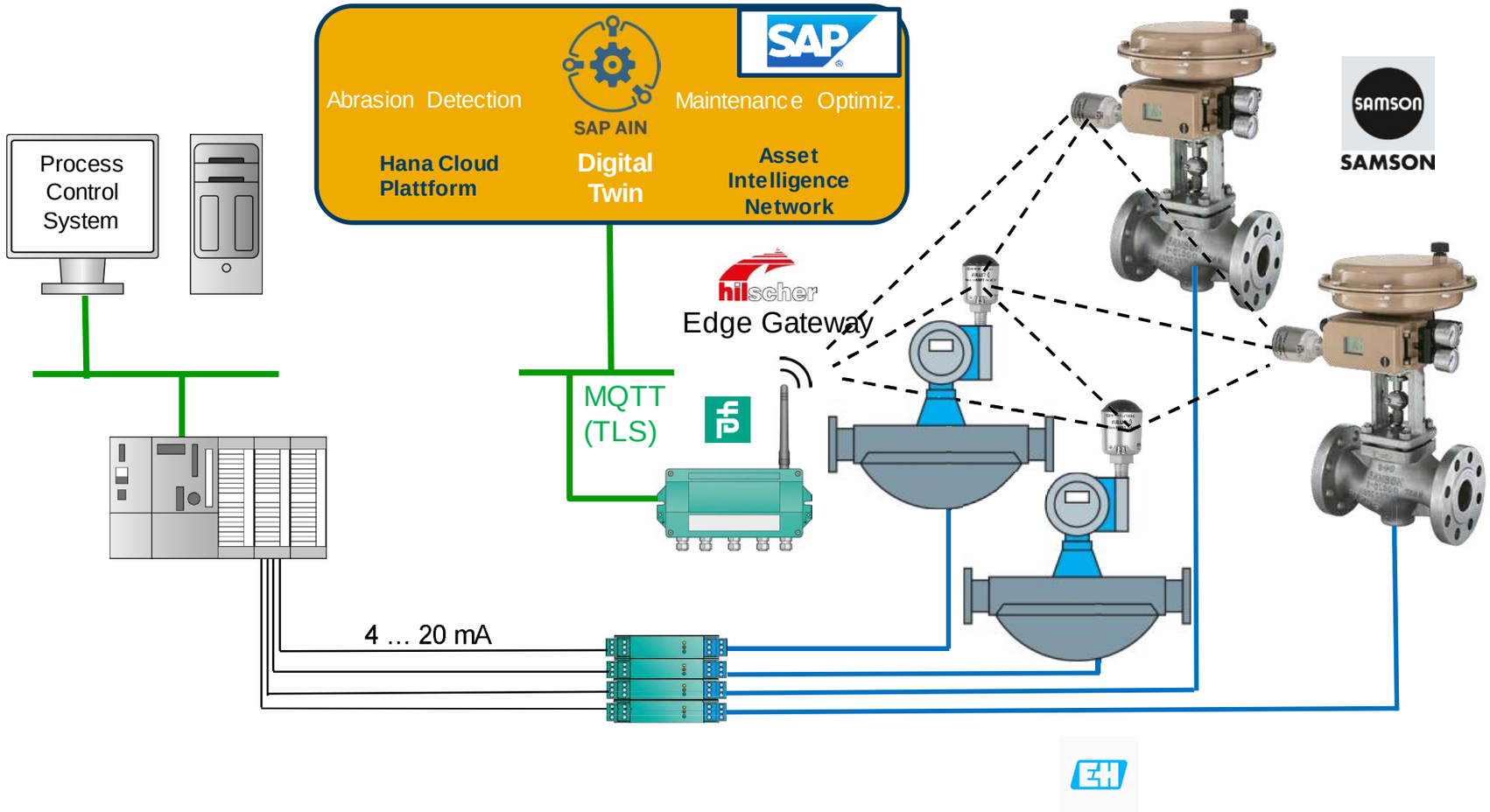
# Connection Of Field Devices To Sap-IOT-Services & Apps

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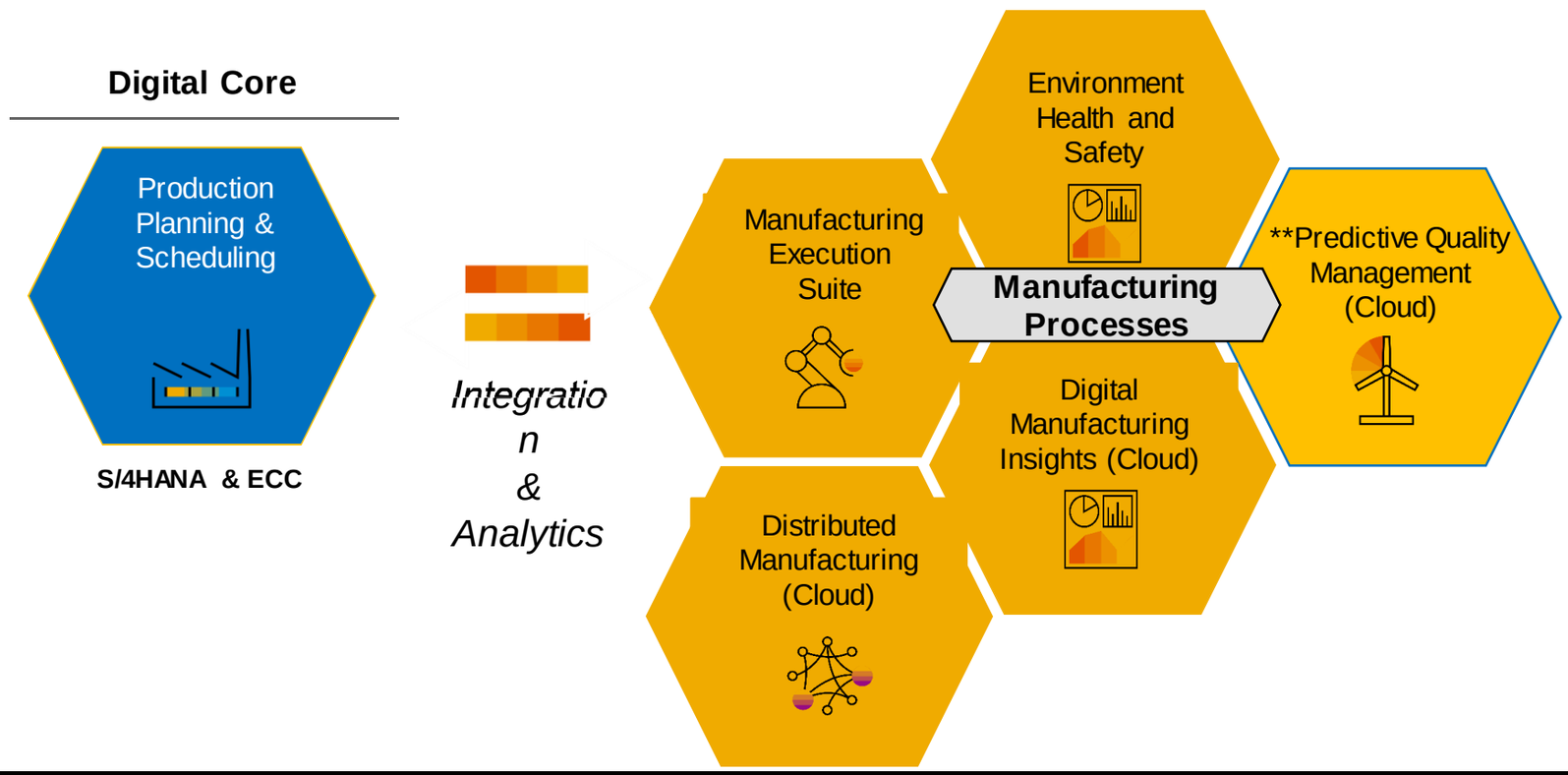
# SAP IoT for Digital Manufacturing

January 2018

SAP Run Simple

# Digital Innovation for Manufacturing Execution & Industrial Analytics

**“Process Driven Analytics to Drive Process Improvements”**

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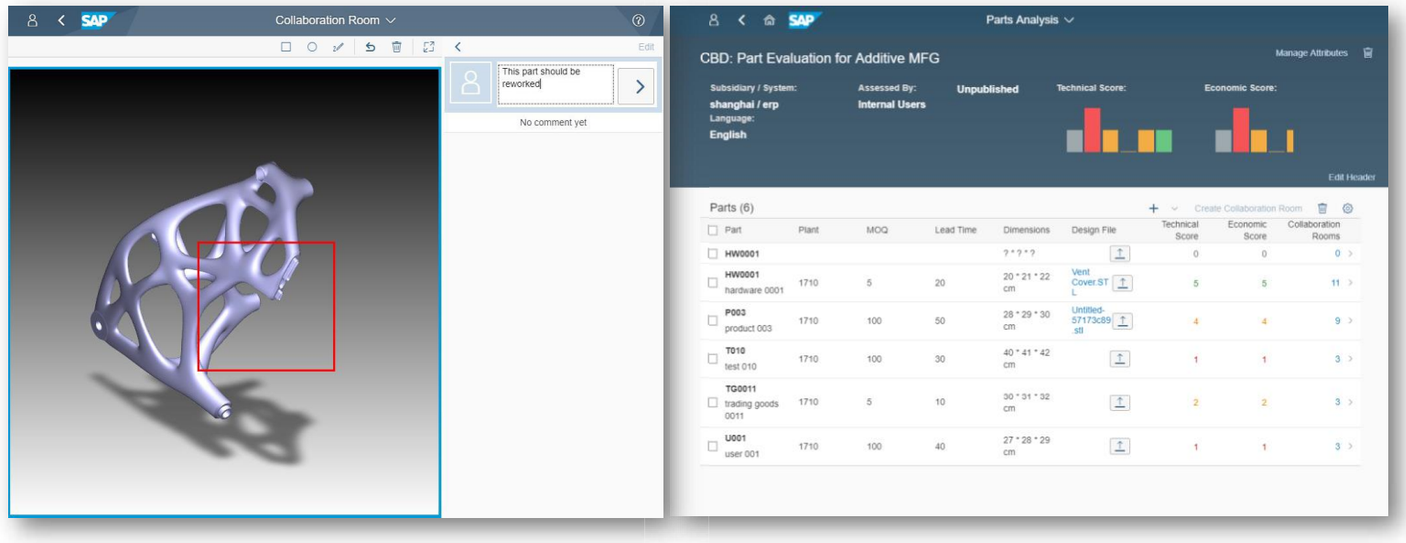
# SAP DISTRIBUTED MANUFACTURING

…provides a cloud-based collaborative platform that connects customers with (additive) manufacturing service providers, e.g., suppliers of 3D printing services, material providers, original equipment manufacturers (OEM), and technical certification companies.

## Key Capabilities

- Collaboration between customers and service providers on design optimization, quality and pricing
- Technical and economical part assessment by customers
- Integration with S/4HANA Cloud for sourcing and procurement
- Service offering advertisement by service providers
- Extensibility to enable scenarios specific to domains, customers or service providers.

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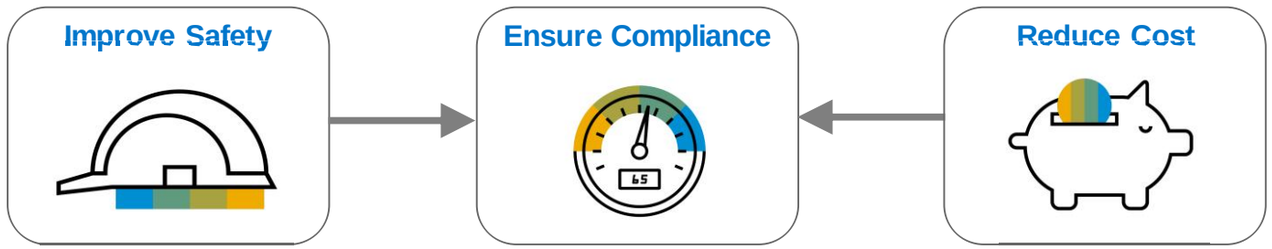
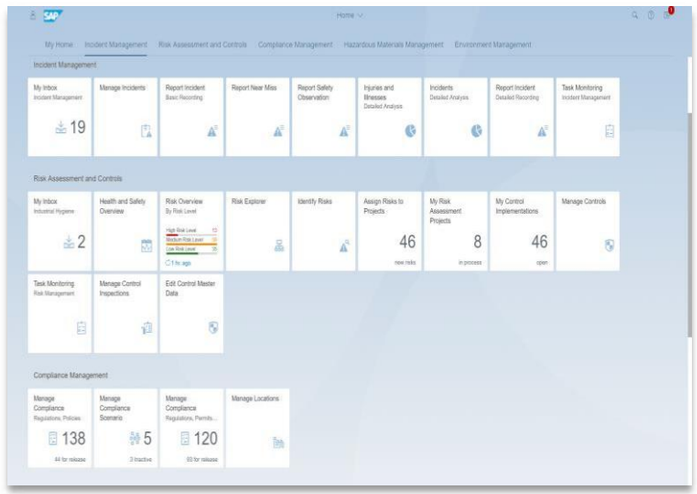
# SAP ENVIRONMENT HEALTH AND SAFETY

….takes a holistic, integrated approach to embed safety, compliance, and risk management into all of your operations. It is unmatched in its capabilities to deliver real-time insight to all levels of the organization, leveraging a robust set of transactional and analytics tools.

## Key Capabilities

- Track the full lifecycle of all types of incidents from initial reporting to investigation to corrective actions
- Risk Assessment lifecycle from hazard identification, impact assessment, risk ranking, and application of controls
- Mobile and offline options for reporting incidents and safety hazards, supporting a proactive safety culture
- Repository and task tracking for all regulatory, permit, and policy requirements
- Direct integration to Human Resources data, Asset Management, Finance, and other key enterprise processes
- Realtime analytics tools within the EHS processes and also integrated with the rest of the enterprise



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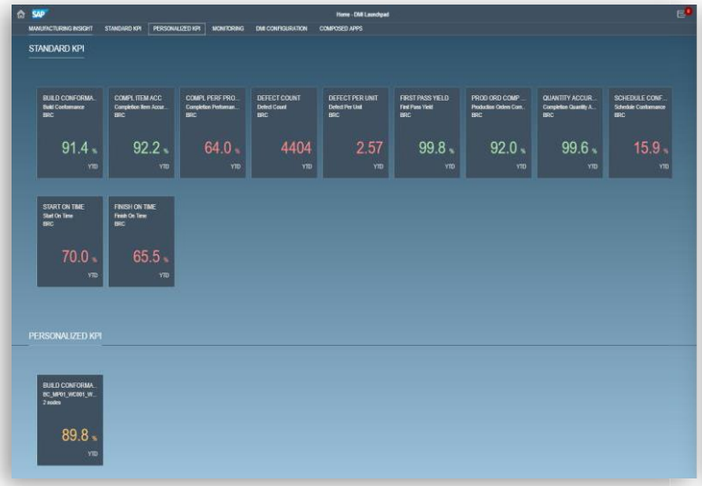
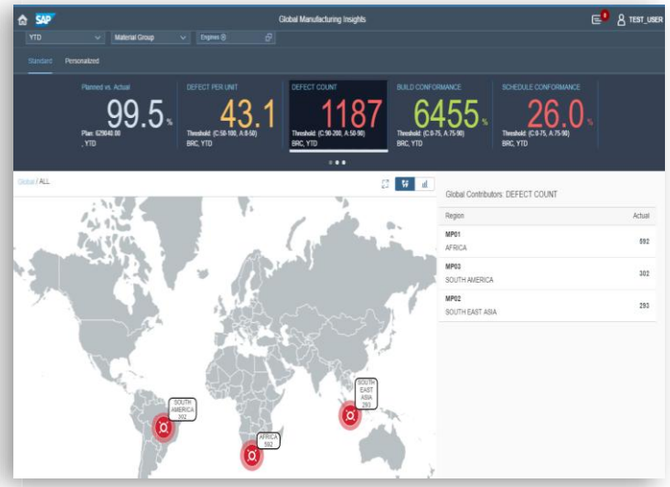
# SAP DIGITAL MANUFACTURING INSIGHTS

….is a centralized, cloud-based, data-driven manufacturing performance management solution which enables key stakeholders of manufacturing operations to take tactical and strategic decisions to achieve best-in-class manufacturing performance.

## Key Capabilities

- Analyze manufacturing performance within and across manufacturing plants of an enterprise
- Data acquisition from multiple disparate manufacturing application and harmonization of manufacturing data
- Pre-configured industry standard manufacturing Key Performance Indicators (KPIs) and flexibility to extend or create new KPIs
- Advanced algorithms for root cause analysis of quality defects, pattern detection and prescriptive suggestions for continuous manufacturing performance improvement

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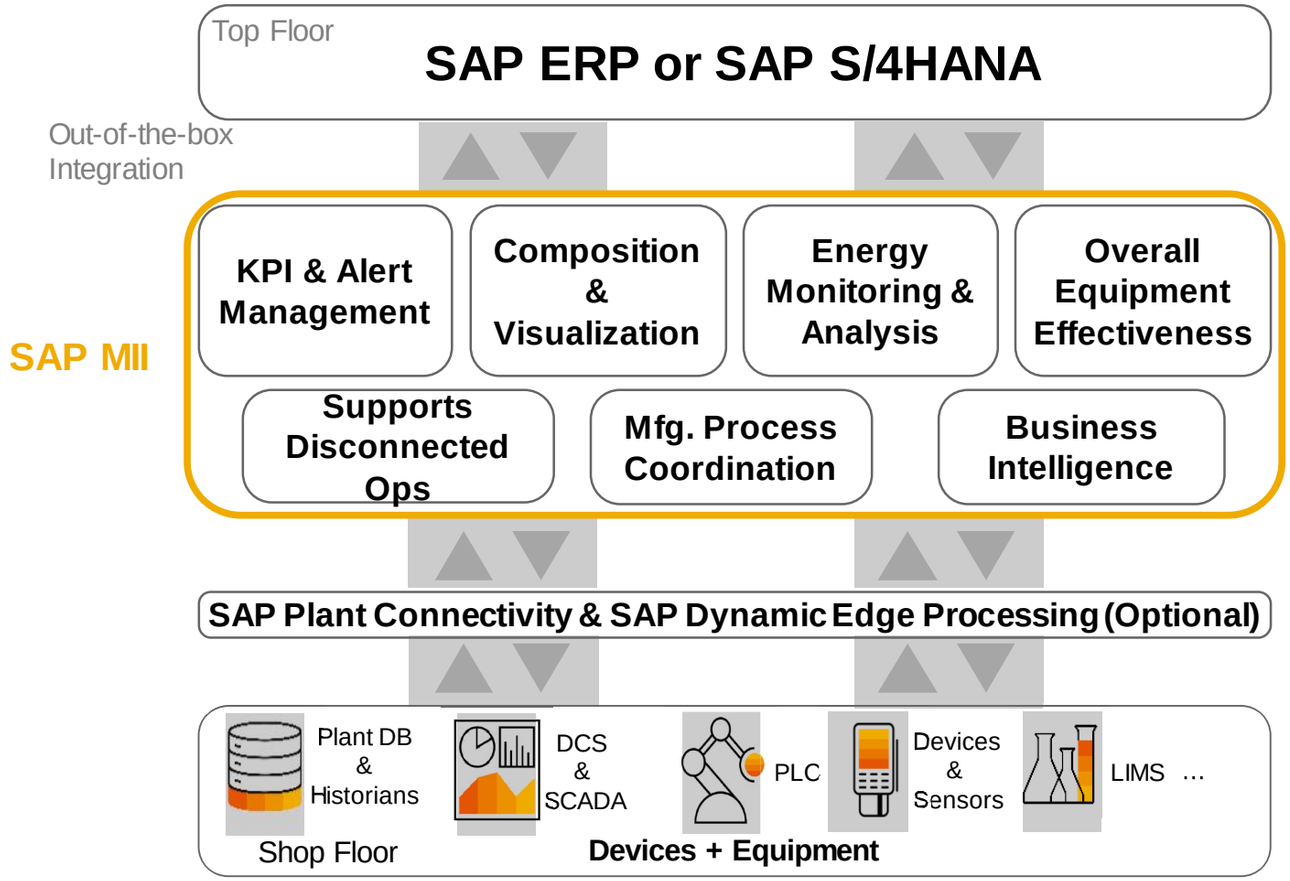
# SAP MANUFACTURING INTEGRATION AND INTELLIGENCE (MII)

…enables you to integrate your plant and enterprise systems and display integrated data to your employees. You can use SAP MII to view, measure, and compare the performance of plants and assets with different automation system infrastructures. Connect to your shop floor equipment using SAP Plant Connectivity.

## Key Capabilities

- **Universal:** Extensible manufacturing platform allowing rapid adaption to any manufacturing process. Applicable to all manufacturing industries and utilities
- **Integration:** Provide interoperability (in)between shop floor solutions and enterprise ERP
- **Intelligence:** Visualize data using plant information hierarchy from “corporate” ERP and design own dashboards
- **Orchestration** via business logic to enable customer-specific processes for planning, execution, maintenance and quality
- **Manufacturing Performance Management** with out-of-the-box content on OEE & Energy analytics. Capabilities to further build, extend and visualize and organize KPIs and share them on demand with UI builder.

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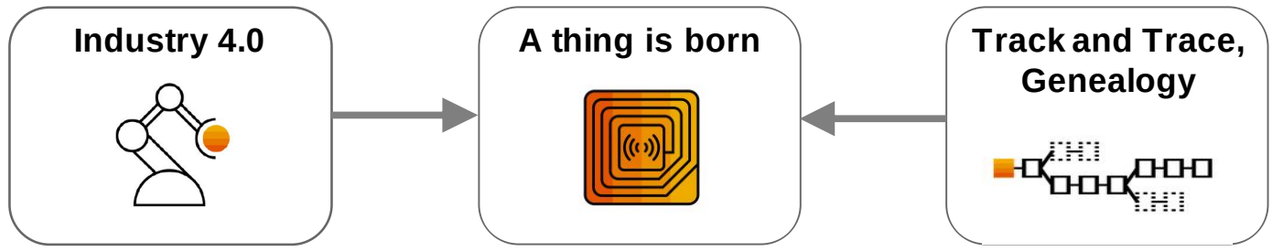
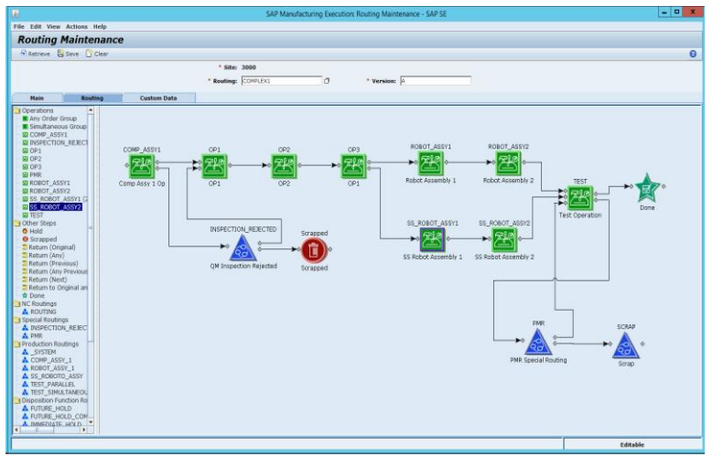
# SAP MANUFACTURING EXECUTION

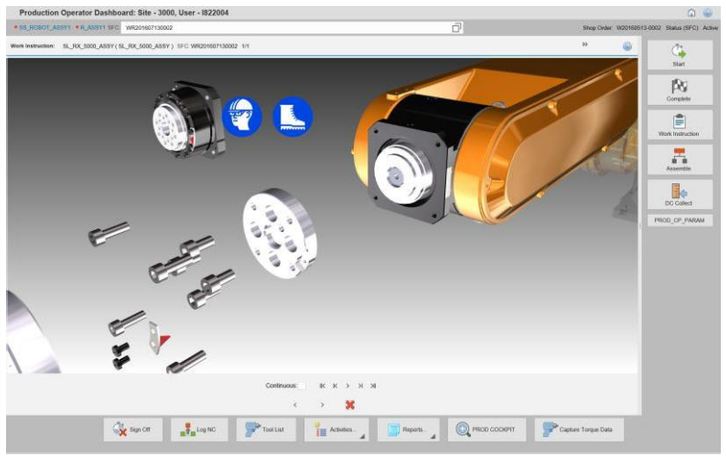
…a powerful, enterprise-level, scalable, manufacturing business solution that enables global manufacturers to manage and control manufacturing and shop floor operations and realize Industry 4.0 scenarios. It provides a multi-faceted set of features that integrates business systems to the shop floor, allowing for complete component and material-level visibility for single and global installations.

## Key Capabilities

- Industry 4.0 enabled shop floor execution solution featuring lot size one production and paperless production
- Tracking & Tracing / Genealogy
- Non-conformance management including in-line sampling, visual test and repair
- Process Interlocking and zero failure
- Role-specific access and personalized dashboards for operators with browser-based UI
- Easy Integration “out of the box” to SAP ERP and via SAP Plant Connectivity to the shop floor
- Overall Equipment Effectiveness (OEE)

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# SAP LEONARDO IOT Solutions at a glance

| Connected product | Connected assets | Connected fleet | Connected infrastructure | Connected markets | Connected people | Customer /Partner applications |
|---|---|---|---|---|---|---|
| | | | | | | |
| SAP Connected Goods<br>SAP Intelligent Product Design | SAP Predictive Maintenance and Service<br>SAP Predictive Quality*<br>SAP Predictive Engineering *<br>SAP Asset Intelligence Network<br>Manufacturing Intelligence & Insights<br>Digital Manufacturing Insights<br>SAP Distrubuted Manufacturing | **SAP Vehicle Insights**<br>**SAP Global Track and Trace**<br>**SAP Logistics Business Network*** | SAP Predictive Maintenance & Service for utilities<br>SAP Predictive Engineering<br>SAP Asset Intelligence Network | SAP PdMS for utilities<br>SAP Predictive Engineering<br>SAP Smart Traffic*<br>SAP Connected Agribusiness | SAP Worker Safety<br>…… | Partner Solutions<br>…… |

* Future

…Connects things with people and processes

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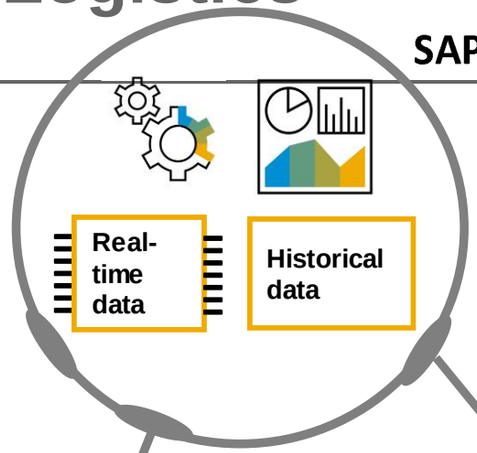
# SAP IoT for Logistics

January 2018

Run Simple

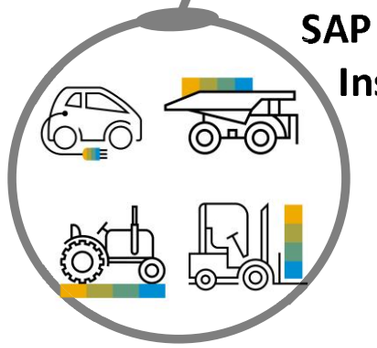
# IoT for Supply Chain & Logistics

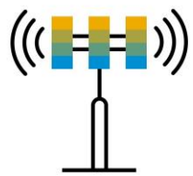



Manage your core business processes

**Enterprise digital core** On premise | Cloud | Hybrid

**SAP Leonardo IoT** Cloud





**“Thing” perspective**

Maximize the value of your fleet and IoT-enabled business assets

**Business process/“network” perspective**

Monitor goods as well as assets in-transit and survey the lifecycle of mass-market products

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# SAP IoT for Logistics | From Connected Moving Assets to the Digital Core

| Key Value Proposition Components | Reveal | Leverage | Create |
|---|---|---|---|
| | **Intelligent insights** | **drive outcomes** | **generate opportunity** |
| Message | Harmonize moving asset information to uncover intelligent insights for people, equipment and networks | Automate processes through integration to logistics, fleet, and mobility. | Monetize new revenue streams and create customer centricity |
| Capabilities | Seamless asset onboarding & connectivity<br>**Fleet performance**<br>• Increase asset utilization<br>• Increase asset Efficiency<br>• Reduce Idling times<br>• Reduce Fuel & Energy Costs<br><br>**Safety**<br>• Improve Driver Behavior<br>• Driver scorecard<br>• Asset usage coaching<br>• Accident notification<br><br>**Compliance** (via telematics)<br>• HOS / DVIR / IFTA /Driver e-logs<br><br>**Visibility & Insights**<br>• Moving Asset Monitoring & Tracking<br>• Logistics Patterns & Networks<br>• Transport quality & condition monitoring<br>• Cold Chain<br>• Tracking of Containers / Pallets / Products | **Alerting & events**<br>• Utilization, asset status and incident triggers<br>• Prescriptive workflow for maintenance<br><br>**Logistics**<br>• Network visibility<br>• Orchestration of assets at ports/warehouses<br>• Route optimization during execution<br>• Warehouse & Transport Planning improvements (TM & EWM integration)<br>• Geofence asset movement tracking<br><br>**Enterprise integration (ECC / S4Hana)**<br>**Finance**: asset utilization and operation cost to improve investment and financial decisions<br>**Supply Chain:** logistic patterns & transport quality execution challenges resolution<br>**Manufacturing**: optimize, automate and orchestrate intralogistics operations<br>**Asset Management**: downtime, incident and efficiency info to asses asset lifecycle management | **Discover New Markets**<br>• Innovate fast and cheap, SaaS / PaaS<br>• Networked logistics<br>  ◦ Optimize demand & capacity<br>  ◦ Sell / resell / buy capacity<br>• Autonomous driver support<br>• Artificial Intelligence – asset efficiency learning & pattern recognition<br><br>**Customer centric solutions**<br>• Enhance Customer Service via accurate arrival/delivery estimates<br>• Incorporate customer choice – delivery optimization<br>• Improved aftersales - parts track and trace<br>• Customer collaboration and feedback<br><br>**Mobility**<br>• Electric vehicle fleet load & charge management<br>• Ridesharing |

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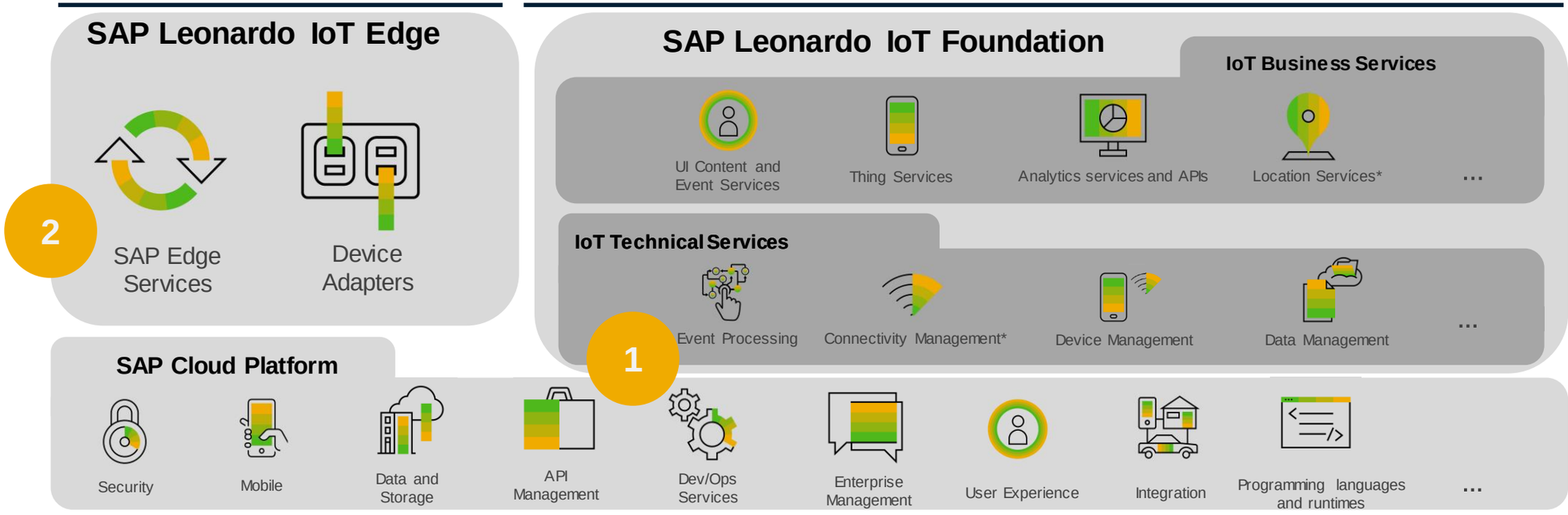
# SAP Leonardo IoT – E2E Solutions

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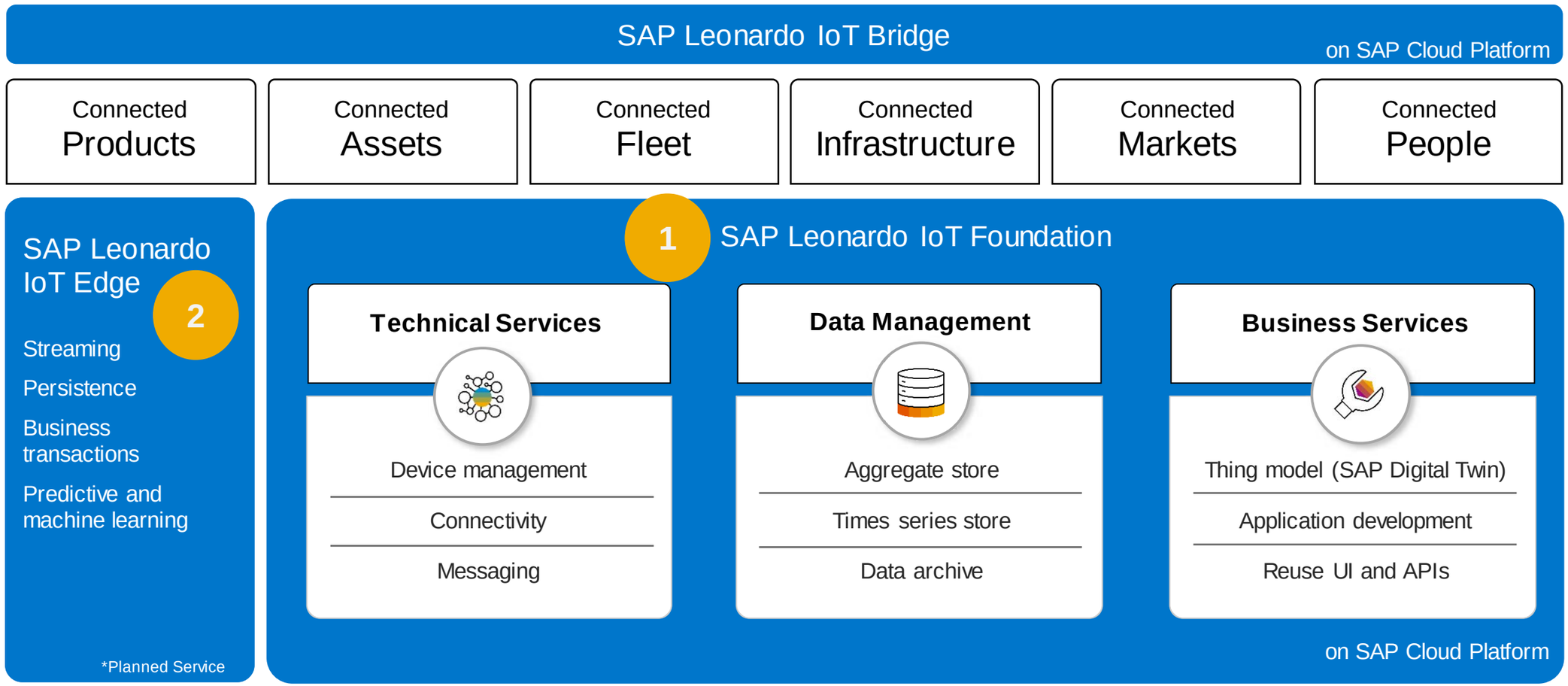
# SAP Leonardo Internet of Things

## Focus on Foundation and Edge

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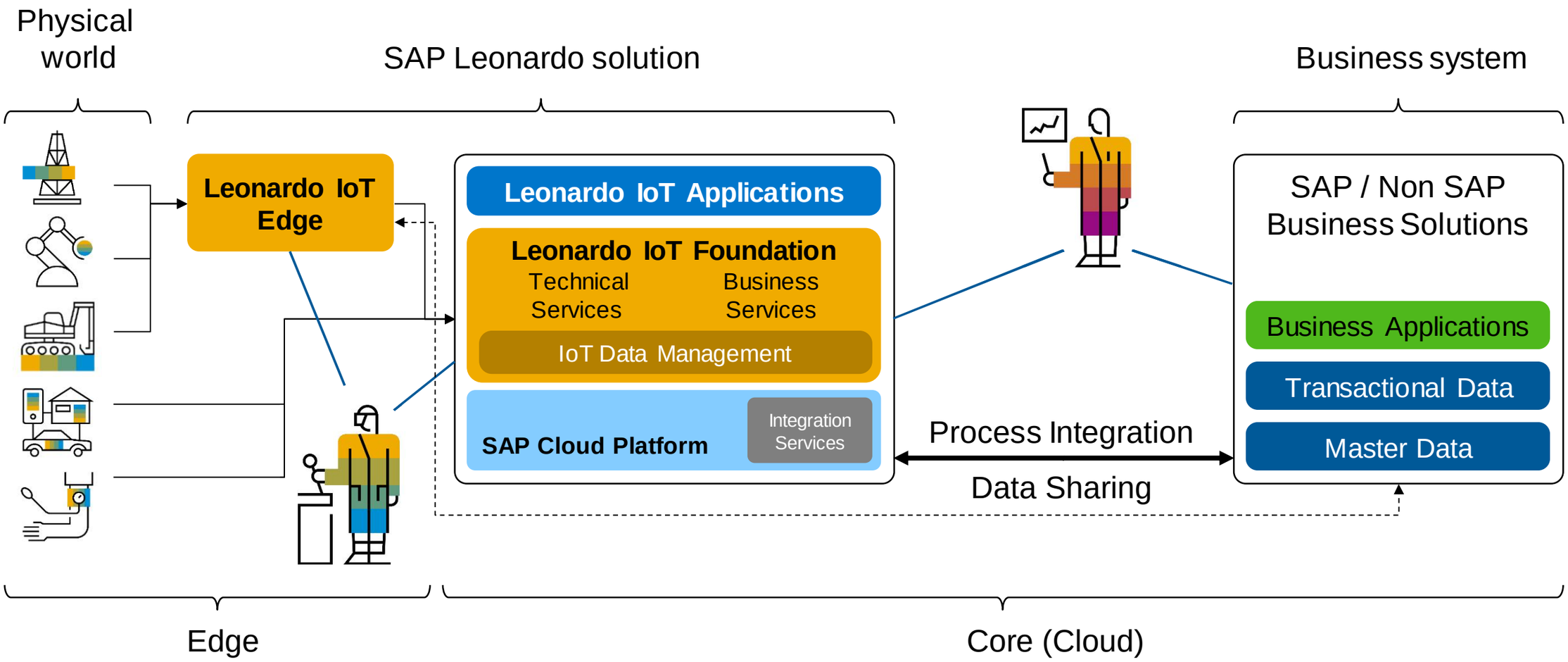
# SAP Leonardo solution architecture for IoT

## High Level Overview

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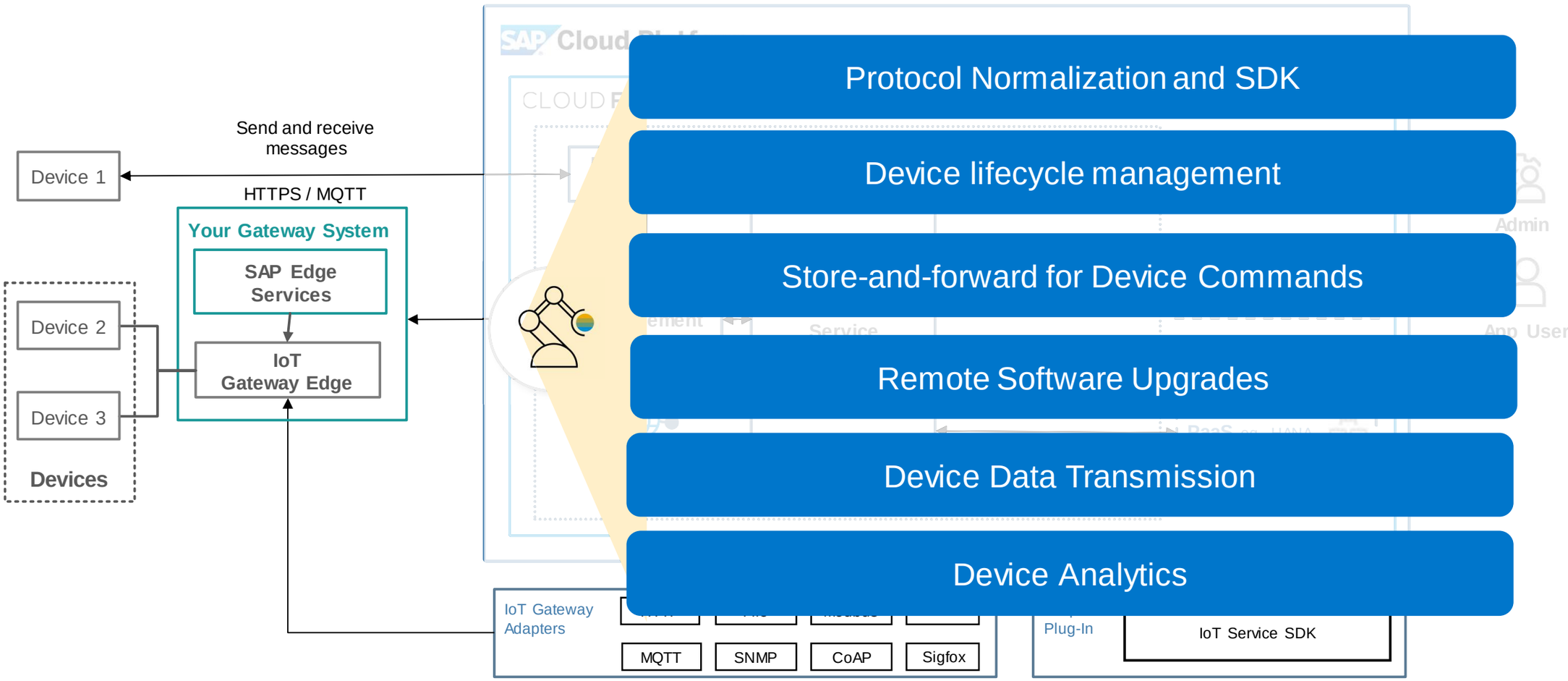
# SAP Leonardo IoT Innovation Portfolio: Foundation

## Technical Services (Device Management)

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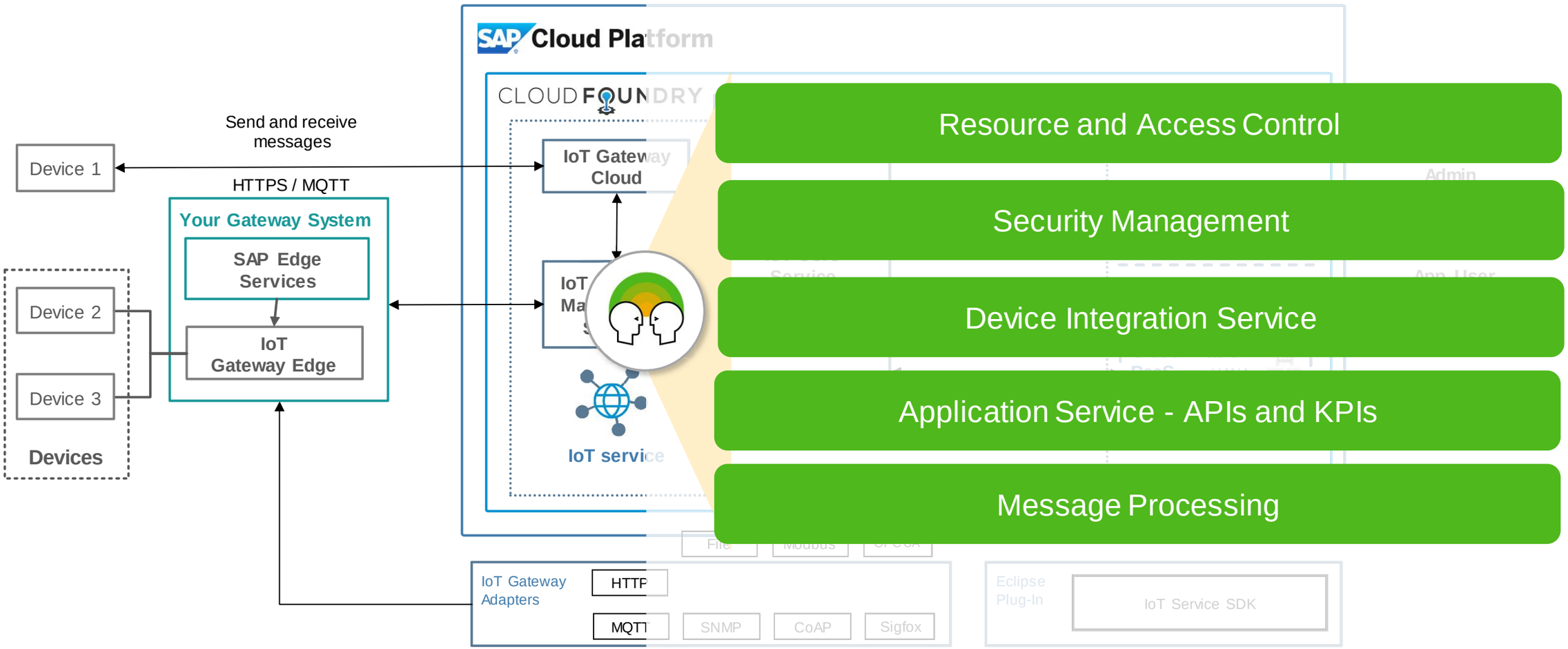
# SAP Leonardo IoT Innovation Portfolio: Foundation

## Technical Services (Core Services)

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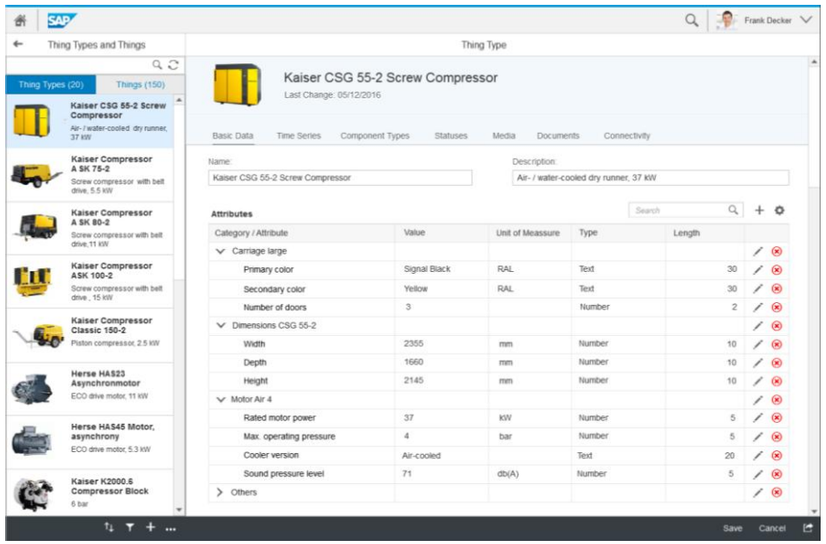
# SAP Leonardo IoT Innovation Portfolio: Foundation

## Business Services (Thing Model – Digital Twin)

**Manage the digital twin -** thing data, hierarchies, time series, and events



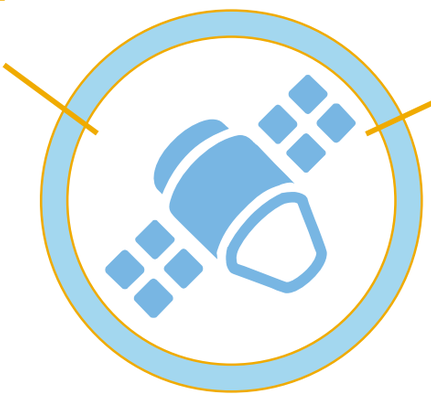

SAP IoT Application Enablement includes micro-services and re-usable components providing business semantics to model physical devices and processes across different industries and IoT scenarios.
This is the foundation for all IoT scenarios from SAP and the partner ecosystem.

**Thing Hierarchies**

- Structure
- Hierarchy
- Relationships

**Thing Data**

- Basic Data
- Properties
- Status
- Documents & specifications



**Thing Packages**

- Flexible Usage in different applications
- Thing configurations

**Time Series & Events**

- Measurements
- Thresholds
- Error codes
- Alerts

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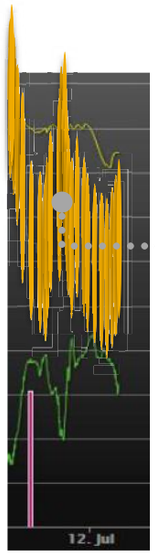
# SAP Leonardo IoT Innovation Portfolio: Foundation

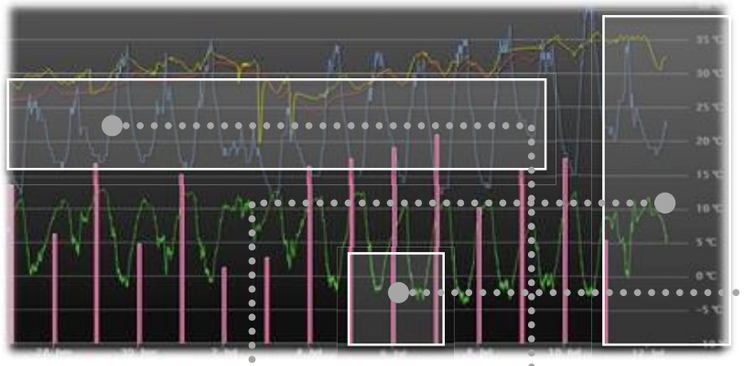
## Business Services (Big Data Management and Analytics)

**Tiered data storage and analytics for IoT -** Combine SAP HANA and big data storage

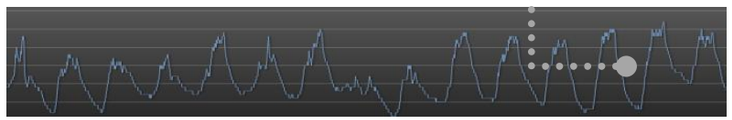
### Time Series Aggregate Store

- **SAP HANA**
- **Time Aggregates** e.g. AVG, MAX, MIN over 120 sec intervals, hours, weeks
- Covers majority of visualization & reporting needs (e.g. dashboard, multi-day charts,...)
- High-performance, flexible selections with full SQL



### Archive / Cold Store



- Object storage
- Individual data points of time-series data
- High-latency access
- Retention period: **multiple years**

### Time Series Store

- Short-term: **Cassandra** (planned **SAP Data Hub**)
- Individual data points of time-series data
- High-performance access on single objects and updates possible
- Retention period: **multiple months**

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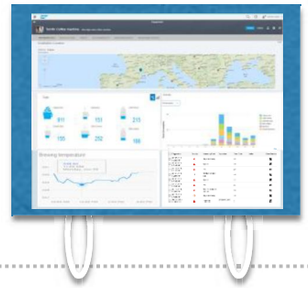
# SAP Leonardo IoT Innovation Portfolio: Foundation

## Business Services (Application Development)

3

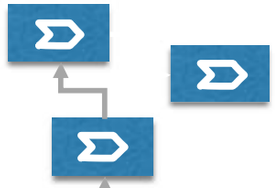


User Interfaces

**IoT Application Builder**

- Web-based development environment
- IoT project templates and UI Components
- Rules Modeler
- KPI Modeler

2

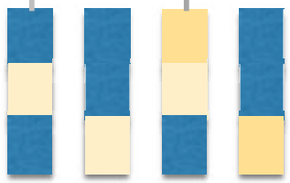


Mash-Up Services

**IoT Mash-up Service Builder**

- Web-based service composition environment
- Event and API-driven application flows modelling
- Rich selection of reusable process atoms

1



Micro-Services

**IoT Application Services**

- Thing Model
- Business Partner Authorization
- Partner and Customer's own micro services

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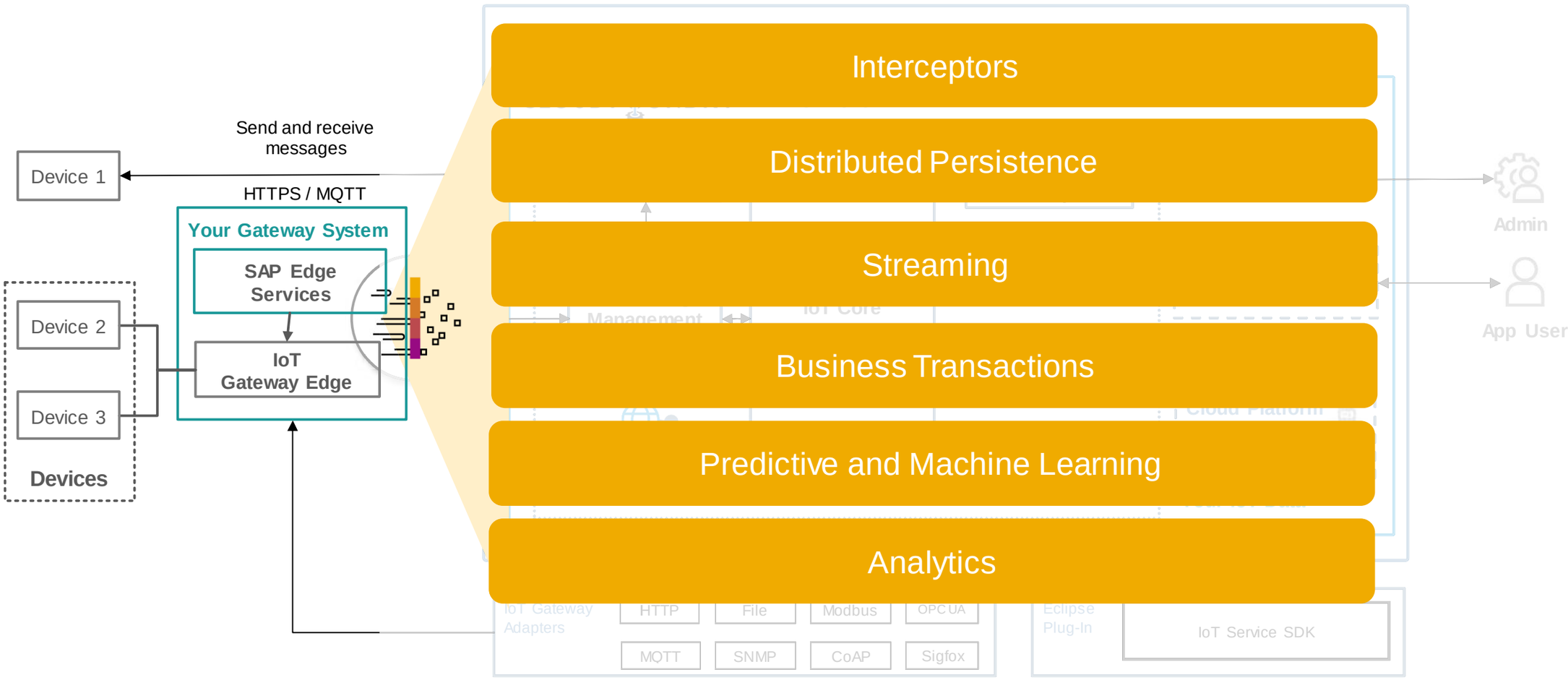
# SAP Leonardo IoT Innovation Portfolio: Edge

## Edge Services

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# SAP Leonardo Internet of Things

## Protocols via IoT Edge (1)

### Protocols

**HTTP**[1]
Zigbee
XBee
ZWave
6lowPAN
BT & BTLE
WiFi & LPWiFi
IEEE 802.15.4
**MQTT**[1]
**CoAP**
TR069
**SNMP**
HART & W-HART
**SIGFOX**
Semtech LoRa
NWAVE UnB
DDS
BACNET
LON
KNX
**Modbus**
Profibus
Infibus
DLMS/COSEM
KSAT (Viasat)
PLC(*)
**OPC UA**
OMA LWM2M(*)
Active Message
SWAP(*)
XMPP
LoRa
**File**

### Vendors

Agora Energy
Agulla
AnyDATA
Arduino
Asoka
ATIM
Axible
AXIS
B&B Electronics
CalAmp
Cisco
CloudGate
CPL
Cradlepoint
Dell
DiGi
Digicom
Distech Controls
E-Senza
Ekahau
Elster
EPISENSOR
Eurotech
Honeywell
Intenses
ITRON
Kamstrup
LIBELIUM
Marvell
MeterSit
MICRON
Mobile Devices
Morey Corp.
NaelBox
Netcomm Wireless
NETVOX
NWAVE
Orbiwise
Packet Power
PARADOX
PIKKERTON
Pulsar
Radiocrafts
RaspberryPI
Schneider Electric
Semtech LoRa
Sensinode
SIERRA WIRELESS
SIGFOX
SimpleHomeNet
SITEC
SmarteoWater
SMARTEX
ST Micro
Sterela
Telecom Design
TELIT
TekPea
TRIDIUM
VIASAT
WAGO
Wi-NEXT
Worldsensing
XIRGO

Create new adapters with IoT Service SDK

Leverage templates based on required connectivity:
UDP, JMS, USB, Custom, CoAP, File, Socket

1 – also device ⇔ cloud *: Limited implantation (**bold = GA**)

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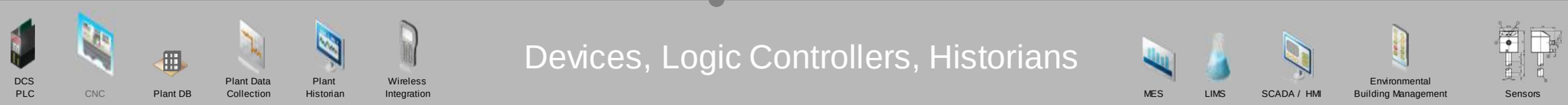
# SAP Leonardo Internet of Things

## Protocols via IoT Edge (2)

### SAP Plant Connectivity (PCo)

Supported protocols: OPC UA, OPC DA, OPC HDA, OPC A&E, TCP Socket, Modbus, MQTT, SDK for proprietary specific agents

Citect, IP21,Osisoft PI (2), Proficy Historian, File-Monitor (2), ODBC, OLE DB, (e.g. ifm Linerecorder-Agent)

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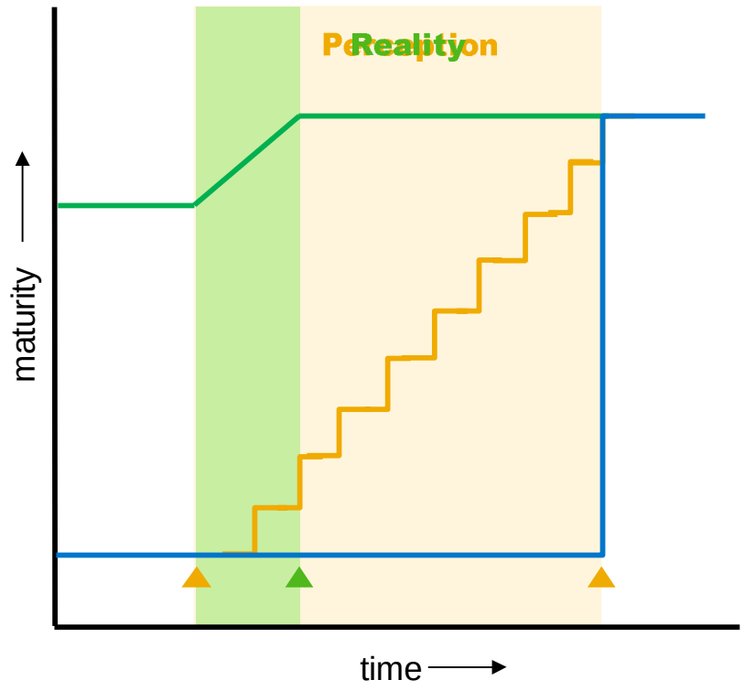
# IoT Security – Integral to SAP Strategy of Edge to Enterprise

## Customer Perspective: Barriers to adoption

- Barriers to adoption:
  - Data privacy concerns: 40%
  - Security concerns: 40%
  - High cost of implementation: 38%
  - Legacy systems: 28%

Source: http://www.ioti.com/security/top-10-reasons-people-aren-t-embracing-iot




**SAP IOT Security – Blogs and White papers**

*SAP Community ]* 5-ways-to-overcome-iot-security-challenges

*[SAP Community ] Three recommendations towards a more secure industrial IoT*

*[SAP Community] The importance of client certificates in IoT*

(SAP Community) See threat-modeling-a-heterogeneous-iot-landscape-part-1/ and onwards

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# … and SAP Leonardo IoT accelerator packages for specific industry scenarios

## Design thinking

Industry & LoB **knowledge** | Software | Services

- Fixed-price bundles
- Targeting common use cases for a 70%–80% fit
- Timeline to value in weeks not years
- 20+ Packages released

| Retail | Consumer products | Discrete manufacturing | Chemicals | Travel and transportation | Utilities | Sports and entertainment |
|---|---|---|---|---|---|---|
| ▪ Assets<br>▪ Logistics<br>▪ Store*<br>▪ Inventory*<br>▪ Shelf*<br>▪ Cold chain* | ▪ Assets<br>▪ Logistics<br>▪ Manufacturing*<br>▪ Cold chain*<br>▪ Consumer* | ▪ Logistics<br>▪ Service and assets<br>▪ Spare parts | ▪ Spare parts<br>▪ Service and assets | ▪ Logistics | ▪ Service and assets | ▪ Venue<br>▪ Team<br>▪ Fans* |
| **SAP Predictive Maintenance and Service** | **SAP Asset Intelligence Network** | **SAP Connected Goods** | **SAP Global Track and Trace** | **SAP Distributed Manufacturing** | **SAP Vehicle Insights** | **SAP Digital Manufacturing Insights** |

**IoT Foundation and Edge**

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# Our Approach

**Standards Matter**

**Security Matters**

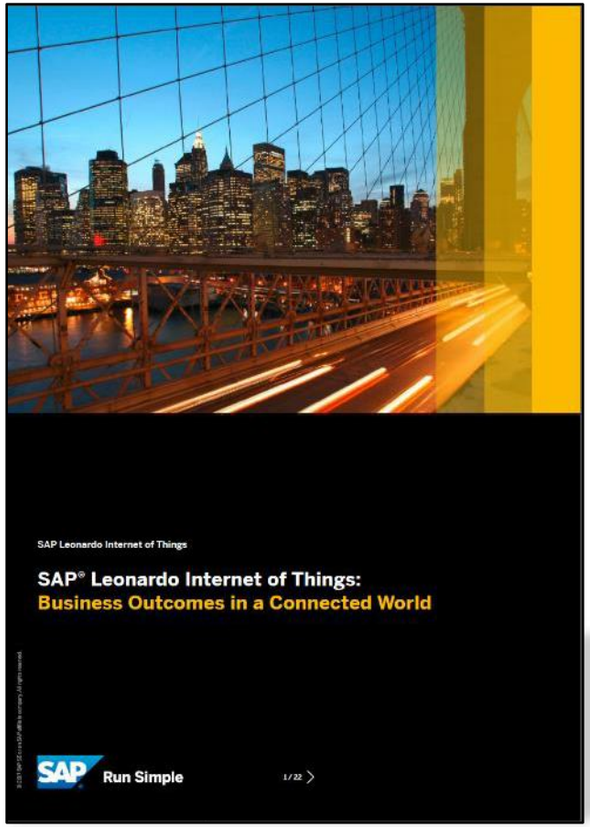
**Privacy Matters**

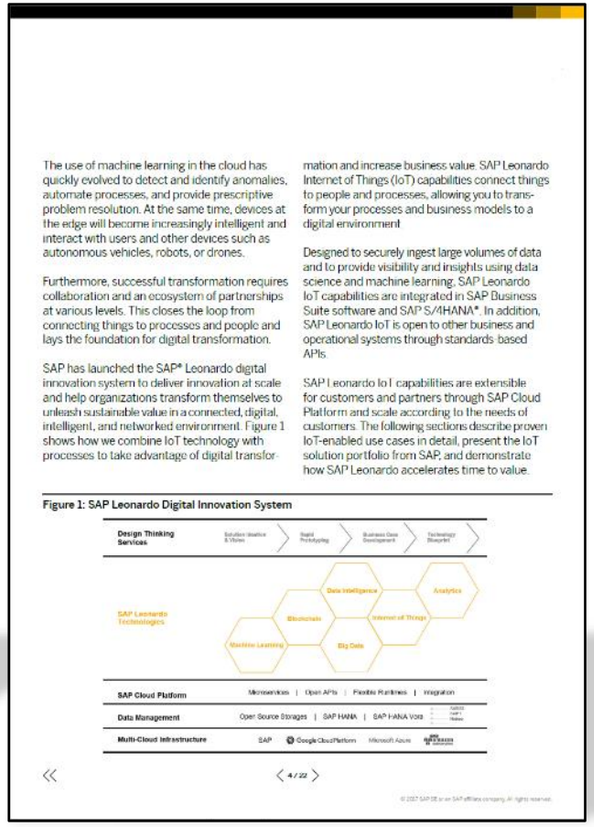
**Neutrality Matters**

**Customer Choice Matters:**
**We support leading infrastructure providers**

# SAP Leonardo IoT white-paper

https://www.sap.com/documents/2017/11/567220fb-df7c-0010-82c7-eda71af511fa.html#





The use of machine learning in the cloud has quickly evolved to detect and identify anomalies, automate processes, and provide prescriptive problem resolution. At the same time, devices at the edge will become increasingly intelligent and interact with users and other devices such as autonomous vehicles, robots, or drones.

Furthermore, successful transformation requires collaboration and an ecosystem of partnerships at various levels. This closes the loop from connecting things to processes and people and lays the foundation for digital transformation.

SAP has launched the SAP® Leonardo digital innovation system to deliver innovation at scale and help organizations transform themselves to unleash sustainable value in a connected, digital, intelligent, and networked environment. Figure 1 shows how we combine IoT technology with processes to take advantage of digital transformation and increase business value. SAP Leonardo Internet of Things (IoT) capabilities connect things to people and processes, allowing you to transform your processes and business models to a digital environment.

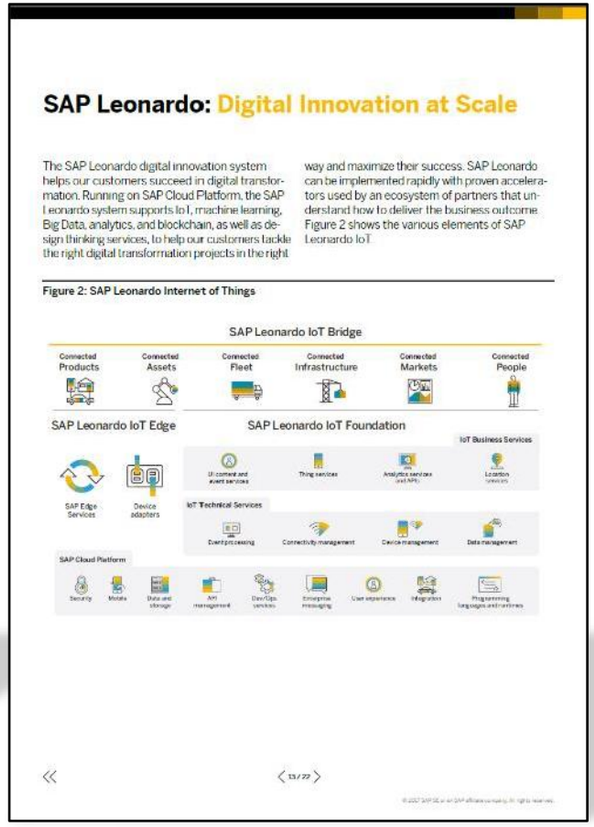
Designed to securely ingest large volumes of data and to provide visibility and insights using data science and machine learning, SAP Leonardo IoT capabilities are integrated in SAP Business Suite software and SAP S/4HANA®. In addition, SAP Leonardo IoT is open to other business and operational systems through standards-based APIs.

SAP Leonardo IoT capabilities are extensible for customers and partners through SAP Cloud Platform and scale according to the needs of customers. The following sections describe proven IoT-enabled use cases in detail, present the IoT solution portfolio from SAP, and demonstrate how SAP Leonardo accelerates time to value.

**Figure 1: SAP Leonardo Digital Innovation System**






## SAP Leonardo: Digital Innovation at Scale

The SAP Leonardo digital innovation system helps our customers succeed in digital transformation. Running on SAP Cloud Platform, the SAP Leonardo system supports IoT, machine learning, Big Data, analytics, and blockchain, as well as design thinking services, to help our customers tackle the right digital transformation projects in the right way and maximize their success. SAP Leonardo can be implemented rapidly with proven accelerators used by an ecosystem of partners that understand how to deliver the business outcome. Figure 2 shows the various elements of SAP Leonardo IoT.

**Figure 2: SAP Leonardo Internet of Things**





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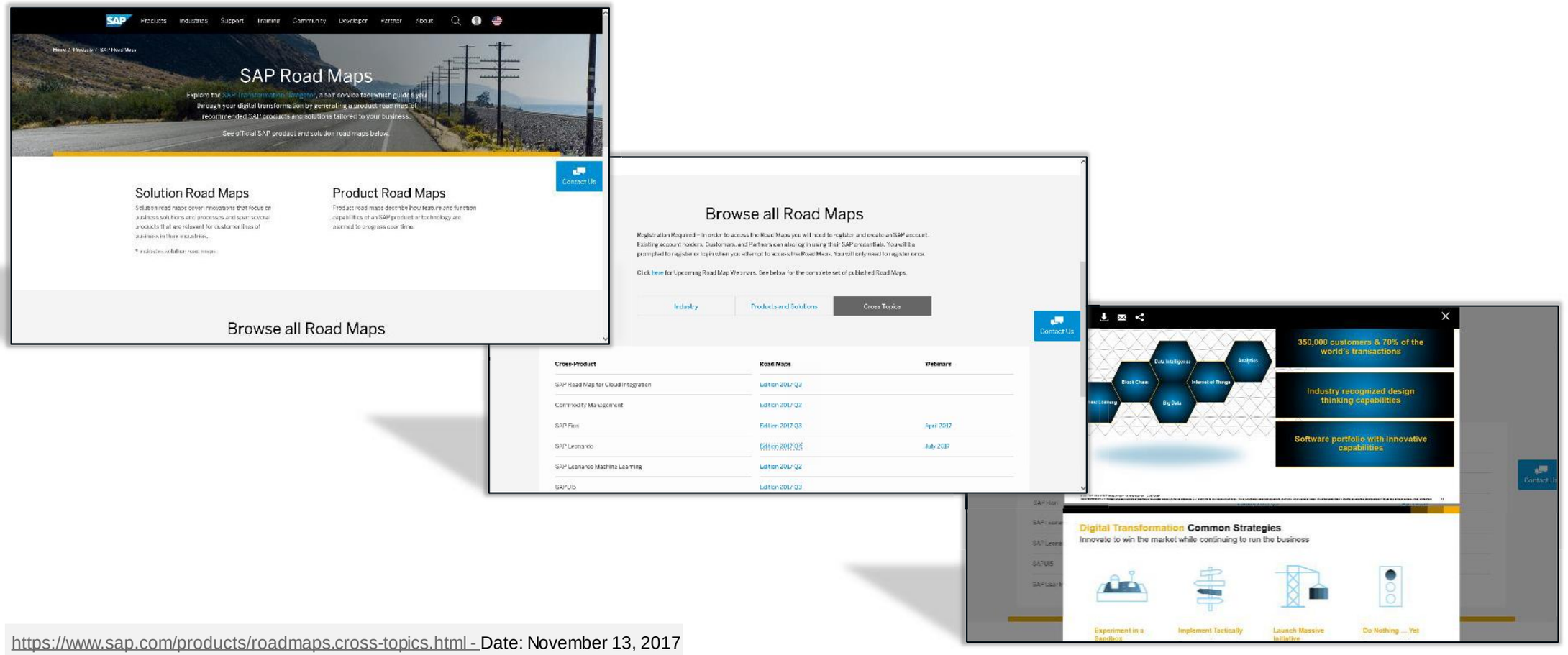
# SAP published comprehensive roadsmaps for many components of SAP Leonardo – including SAP Leonardo IoT




https://www.sap.com/products/roadmaps.cross-topics.html - Date: November 13, 2017

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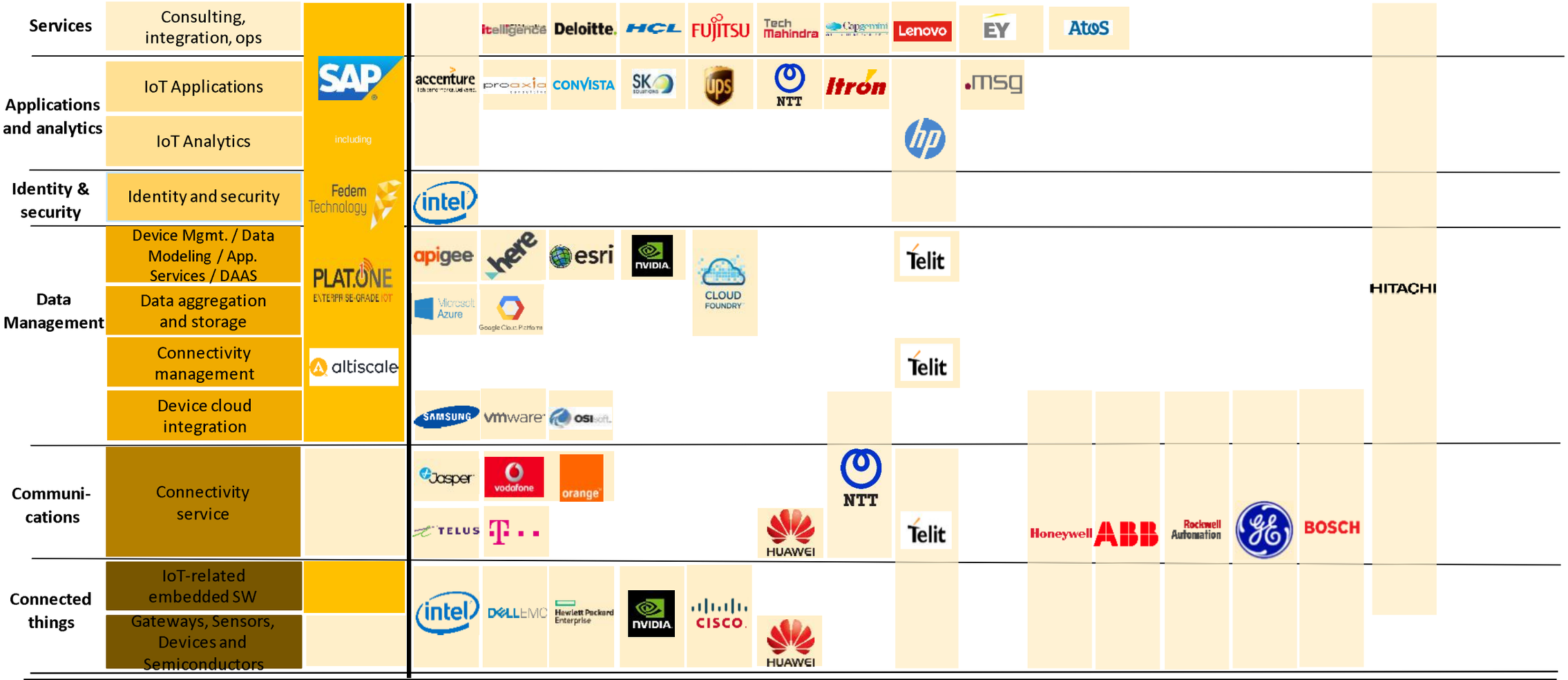
# SAP has a significant partner IoT related Ecosystem

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# In Summary

**You can start now! & leverage what you already have**

**The Edge triggers the core – Core drives the Edge**

**Easy to consume & Open**

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# Q & A

Use this title slide only with an image

# Thank you

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