Enhancing Machine Learning with IoT for an Intelligent Enterprise

Bert Laws, Area Product Manager Machine Learning, SAP
Session ID 82818

About the Speakers

Speaker Name

- Bert Laws, SAP

- Area Product Manager, Machine Learning
10 years at SAP with a background in Performance Management, Financial Solutions, Rapid Deployment Solutions and emerging technologies.

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Key Outcomes/Objectives

1. Understand IOT in the Context of The Intelligent Enterprise

2. Understand the Product Stack and the Fit with S/4HANA

3. Visualize IOT with Machine Learning Use Cases

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- **Agenda**

AI and the Evolution of the Intelligent Enterprise

Overview of the Intelligent Enterprise

IoT in S/4HANA (the Intelligent Enterprise)

Sample *Concept* Cases in Planning

Q&A

AI and the Evolution of the Intelligent Enterprise
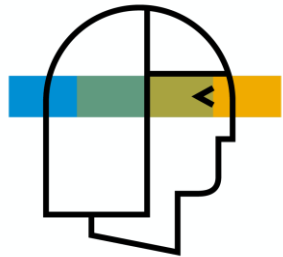
Have you ever taught a
human to learn?

- Many of us help train **machine learning** models daily without knowing it.

tag person

- Amazon.com uses your past purchases to suggest recommended items.

- Instagram uses your feedback to suggest new accounts to follow.

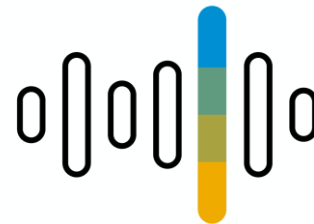- Netflix uses the movies you have viewed to suggest other films.
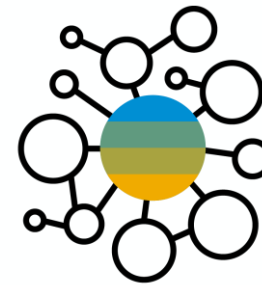
Machine Learning Is Reinventing Business

97%

Image recognition
accuracy today
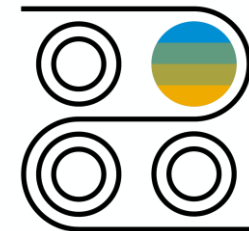(better than the
human rate of 95%)

95.1%

Speech recognition accuracy
today
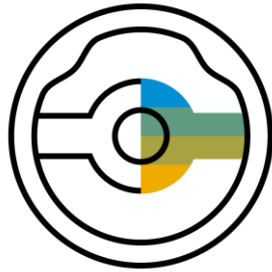(better than the
human rate of 94.1%)

$18 billion

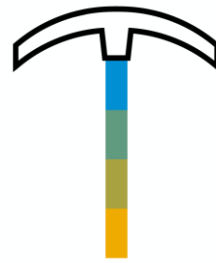Enterprise machine learning
market by 2020

60%

Of human tasks will be
automated by 2025

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Customers are Innovating for the Intelligent Era

A car manufacturer uses object detection and object classification to help customers identify their dream car with an app and guide them to the closest dealer or the car configurator.

A mining company optimizes real-time spare parts procurement with a mobile app, computer vision, and process integration.

A chemical company automates the classification and resolution of customer inquiries to accelerate customer service with less manual effort.

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The Cloud Era is evolving into The Intelligence Era

|	Mainframe and PCs	Client Server and Internet	Cloud, Mobile, and Big Data	Intelligent Technologies
	1960s - 1980s	**1990s - 2000s**	**2000s - 2010s**	**2010s - 2020s**
ENABLING TECHNOLOGIES	• Transistors & silicon revolution • Large scale mainframe computing adoption • Emergence of PCs • Plant floor automation	• Widespread PC adoption • Broadband internet • ERP and business process technologies	• Mobile & smartphone • Cloud computing • Social networks • Big data	• Machine learning & Artificial intelligence • IoT • Blockchain
EVOLUTION OF ERP AT SAP	SAP R/2 — 1972 · SAP R/2 — 1979	SAP R/3 — 1992	mySAP — 2000 · SAP ECC — 2004	**SAP S/4HANA Cloud** 2015
CUSTOMER VALUE CREATION	**Industrial Automation**	**Business Process Automation**	**Digital Transformation**	**Intelligent Enterprise**

New Engagement Model

Customers <u>mandatory</u> for co-innovation

- Need to provide business input <u>and</u> data
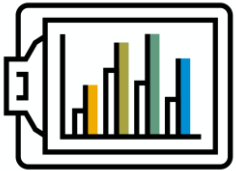
- **Data needed right from the start (PoC)**
  - Real productive (big) data
  - Data must not contain person-related information

Data Scientists

- Data savviness and business knowhow are key

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New Processes

- **Data Exploration and ML know how**
  - Statistical analysis and ML algorithms / technology
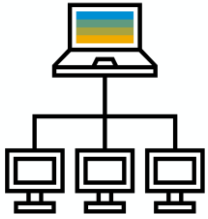 - Understand how ML can automate / support end user tasks

Model Training

- Train initially – retrain continuously

Development Milestone: POC

- Successful POC before start of development

New Challenges

Standard Software

- One model fits all. **NOT.**

- **Quality**
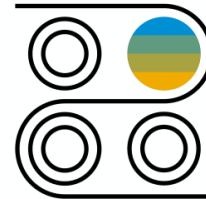 - Correct predictions? Right sets of data? Testing!

Maintenance

- New bugs on the block: ML service just doesn't work as expected ?!?

Data Storage

- Data availability during development
- It must be legally safe

Lifecycle
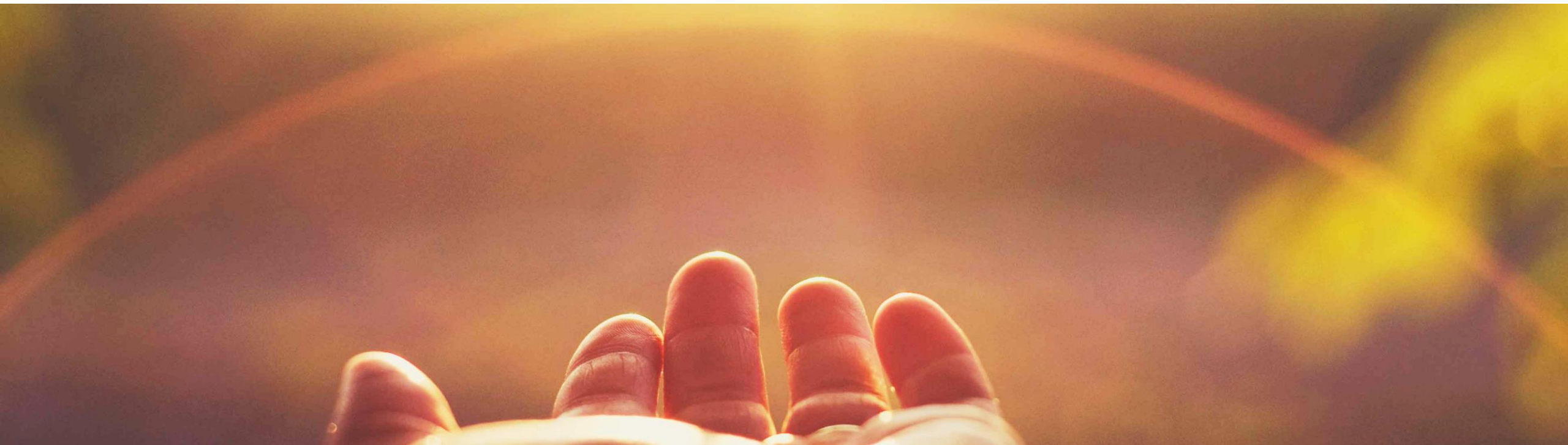
- How, when, and where to test, update and fix

Integrity and Legal

- (Accidentally) excluded data: Risk of a biased ML model
- DPP is always and everywhere
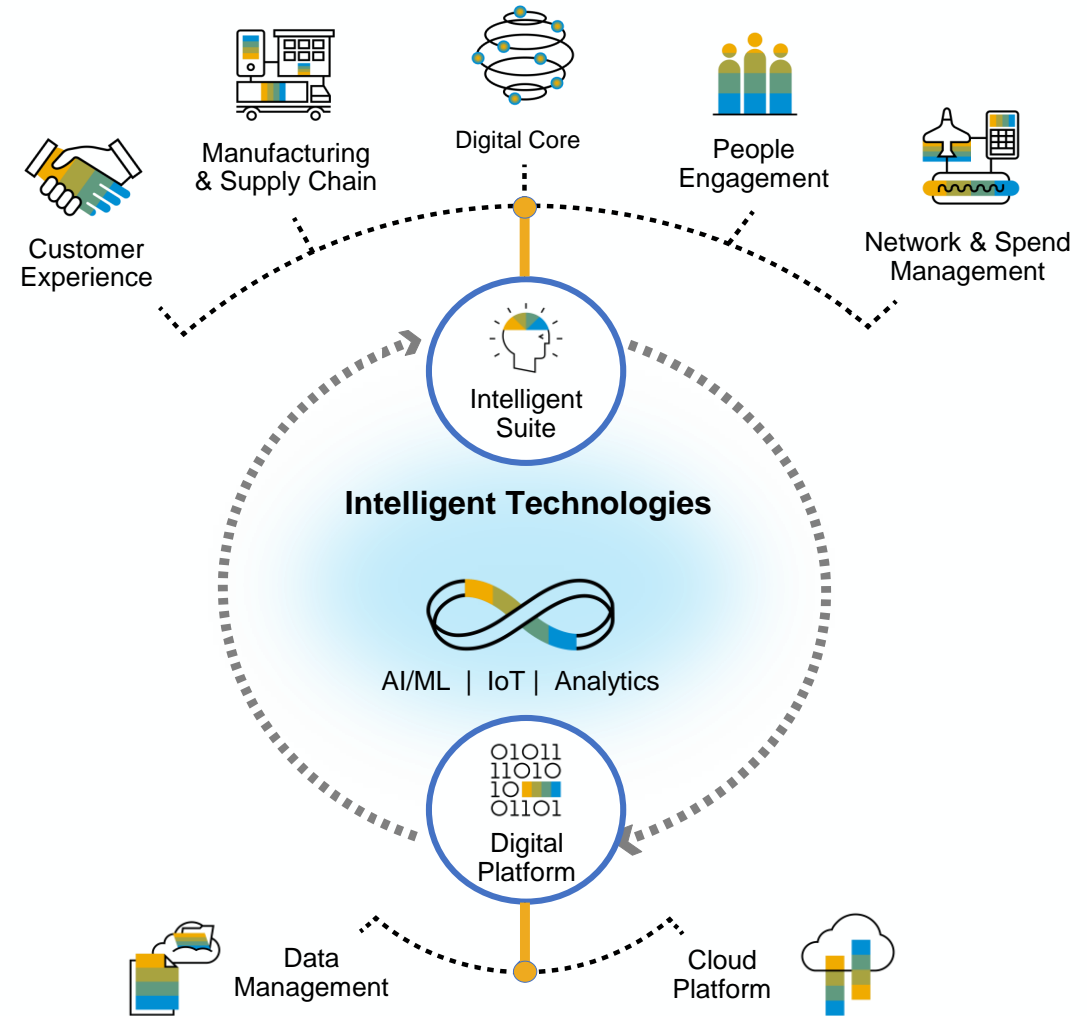
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Overview of the Intelligent Enterprise

Intelligent enterprises use technology and people to innovate with purpose so they can run at their best

The Intelligent Enterprise Framework

The Intelligent Enterprise features

3 key components:

3 Intelligent Suite

2 Intelligent Technologies

1 Digital Platform

Customer Experience

Manufacturing & Supply Chain

Digital Core

People Engagement

Network & Spend Management

Intelligent Suite

Intelligent Technologies

AI/ML | IoT | Analytics

Digital Platform

Data Management

Cloud Platform

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SAP strategy – Deliver the Intelligent Enterprise

Manufacturing & Supply Chain

Digital Core

People Engagement

Customer Experience

Network & Spend Management

Intelligent Suite

Intelligent Technologies

AI/ML | IoT | Analytics

Digital Platform

Data Management

Cloud Platform
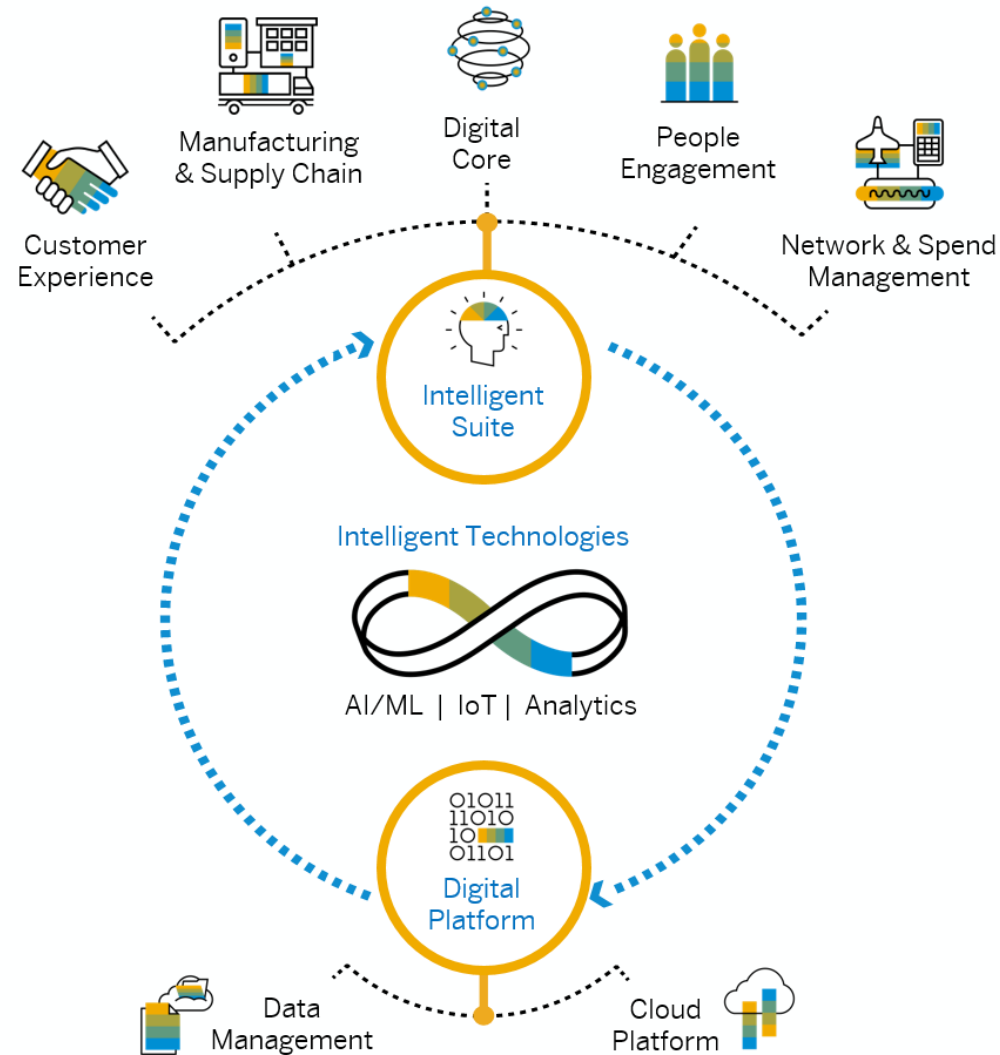
THE INTELLIGENT ENTERPRISE features 3 KEY COMPONENTS:

1. Intelligent Suite

2. Intelligent Technologies

3. Digital Platform

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How SAP Leonardo ML helps to deliver the Intelligent Enterprise

SAP

77%
of the world's transaction revenue touches an SAP system

26
Industries
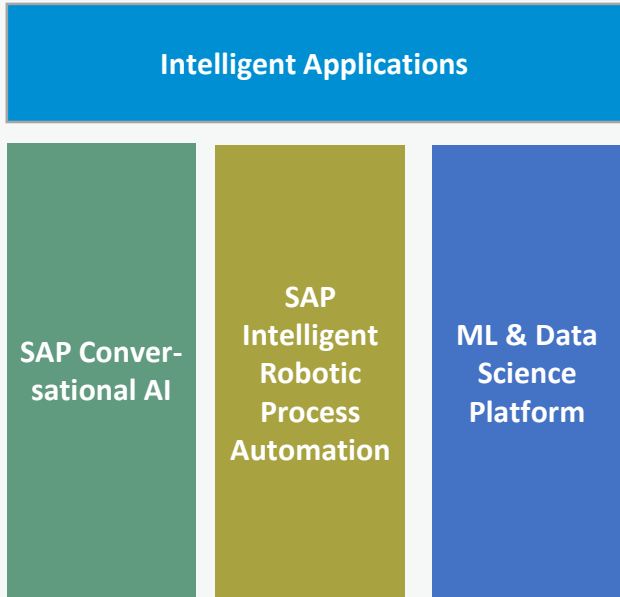
7
lines of business
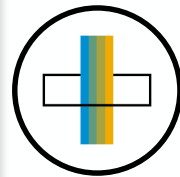
The world's largest business network

Open and flexible building blocks

Intelligent Applications

SAP Conver-sational AI	SAP Intelligent Robotic Process Automation	ML & Data Science Platform

On SAP Cloud Platform & SAP HANA

Business Outcomes

Increase revenue

Re-imagine processes

Quality time at work

Customer satisfaction

Enabling innovations

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SAP Continues Market-Leading Innovation with IoT

~600

customers and partners

+492%

things monitored in 2018
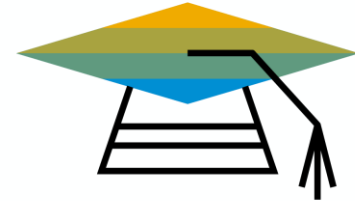
30,000+

learner in openSAP courses on IoT and the intelligent enterprise

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SAP Leonardo IoT
From Internet of Things Data to Business Outcomes

Open Ecosystem & Partnerships

Cloud-to-Cloud interoperability

Vendor-agnostic

Technical Services

Connectivity

Device Management

SAP Leonardo IoT

SAP Leonardo IoT Edge

Customer Experience

Manufacturing & Supply Chain

Digital Core

People Engagement

Network & Spend Management

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SAP Leonardo IoT
From Internet of Things Data to Business Outcomes

- Drive business outcomes with embedded IoT in lines of business applications and further intelligent technologies

- Contextualize and Integrate IoT data with business process information

- Transform your business with open innovation while keeping a clean core

- Extend your business process from the cloud to the edge

- Leverage IoT insights with an integrated application developer experience

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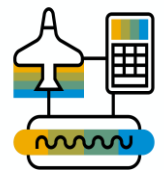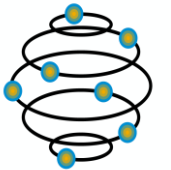
„*The new SAP Leonardo IoT solution is a game changer. It provides business context to IoT data, it enables us to derive meaningful business insights and to tightly embed our custom IoT applications into business processes.*"

Wolfgang Möller,
Global Director Discrete Industries and
Internet of Things, itelligence AG

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SAP Leonardo IoT
Unlock your Intelligent Enterprise

**SAP Leonardo IoT
drives intelligence in 3 key areas:**

3 Business Action

2 Business Insight

1 Business Context

IoT embedded
Intelligent Suite

Standalone IoT
enabled
Business Apps

IoT enabled
Customer Apps

IoT embedded
Business
Processes

Intelligent Technologies

Analytics | ML / AI

Contextual
IoT Data

Cloud

Data
Management

Semantic
Integration

Continuum

Edge

Any
Device

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Replenishment Optimization with IoT
Use Case Example

Sensors and Receptacles

Collect data from receptacles e.g. fill level

Low fill level

Just in time replenishment and optimal storage conditions

SAP Leonardo IoT

Monitoring consumption rates with *streaming rules*

Automatic purchase requisition (*Action*)

Supplier

Supplier receives sales order

Just in time delivery

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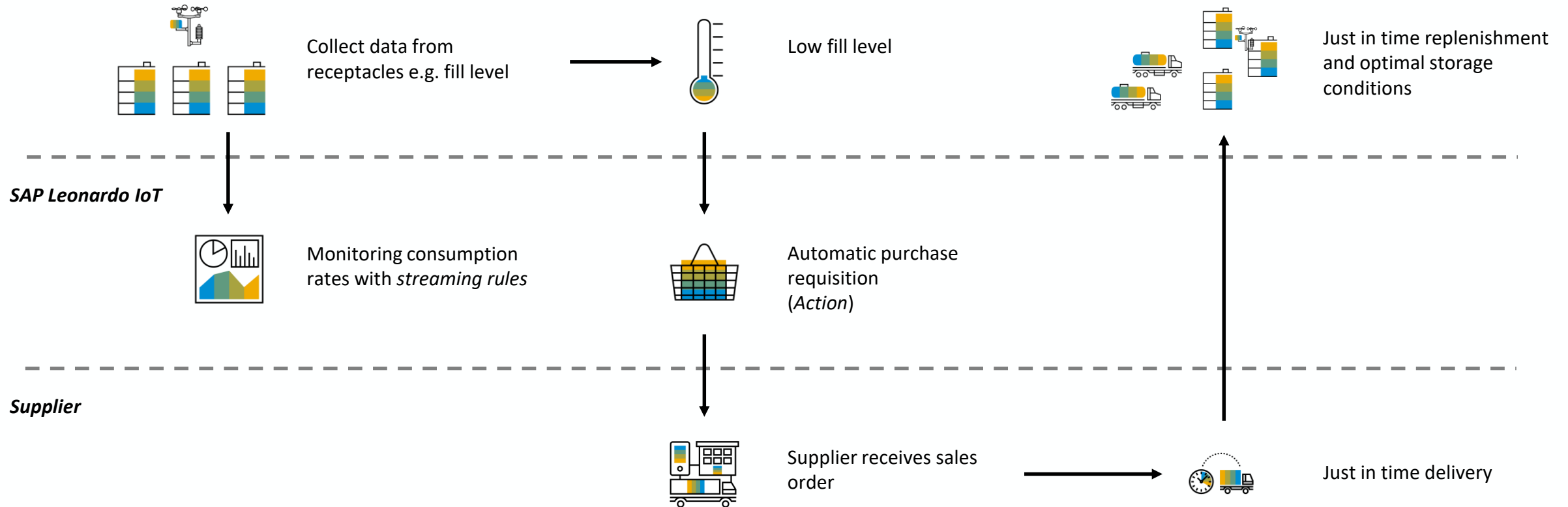
SAP Leonardo IoT in S/4HANA
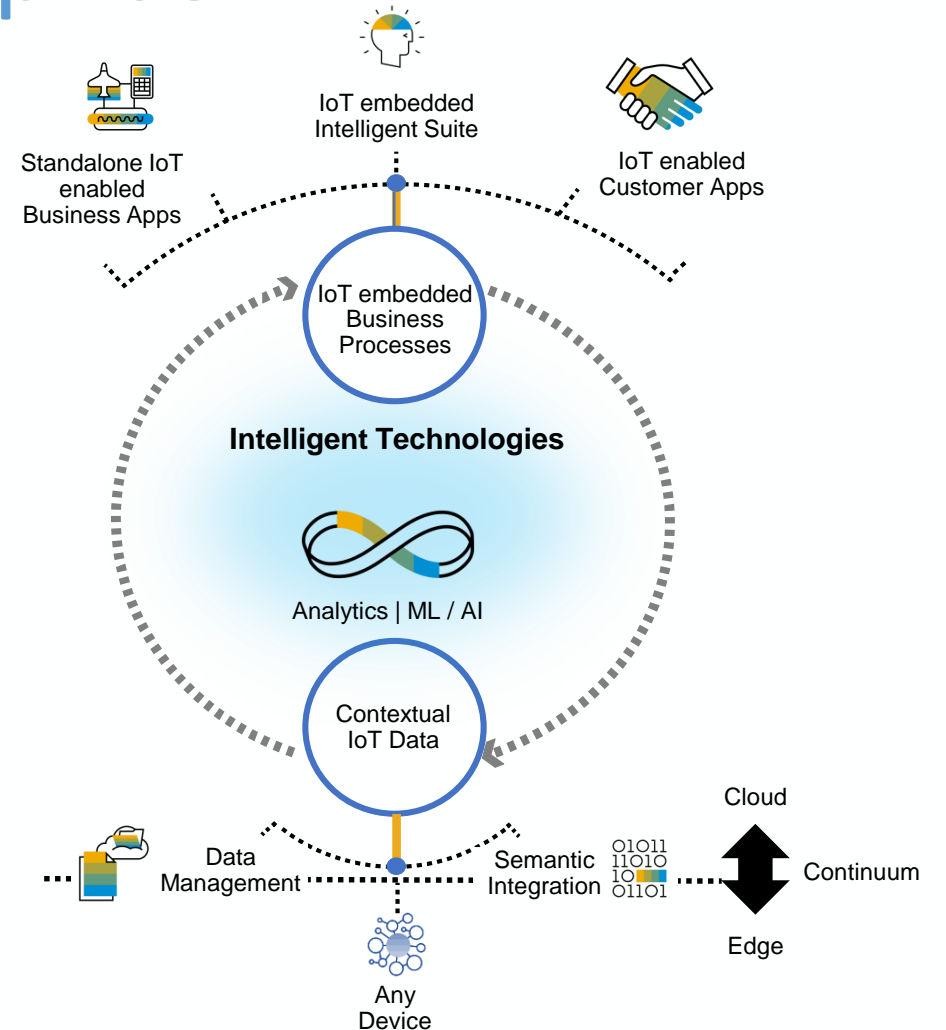
for the Intelligent Enterprise

SAP Leonardo IoT:
Unlock your Intelligent Enterprise
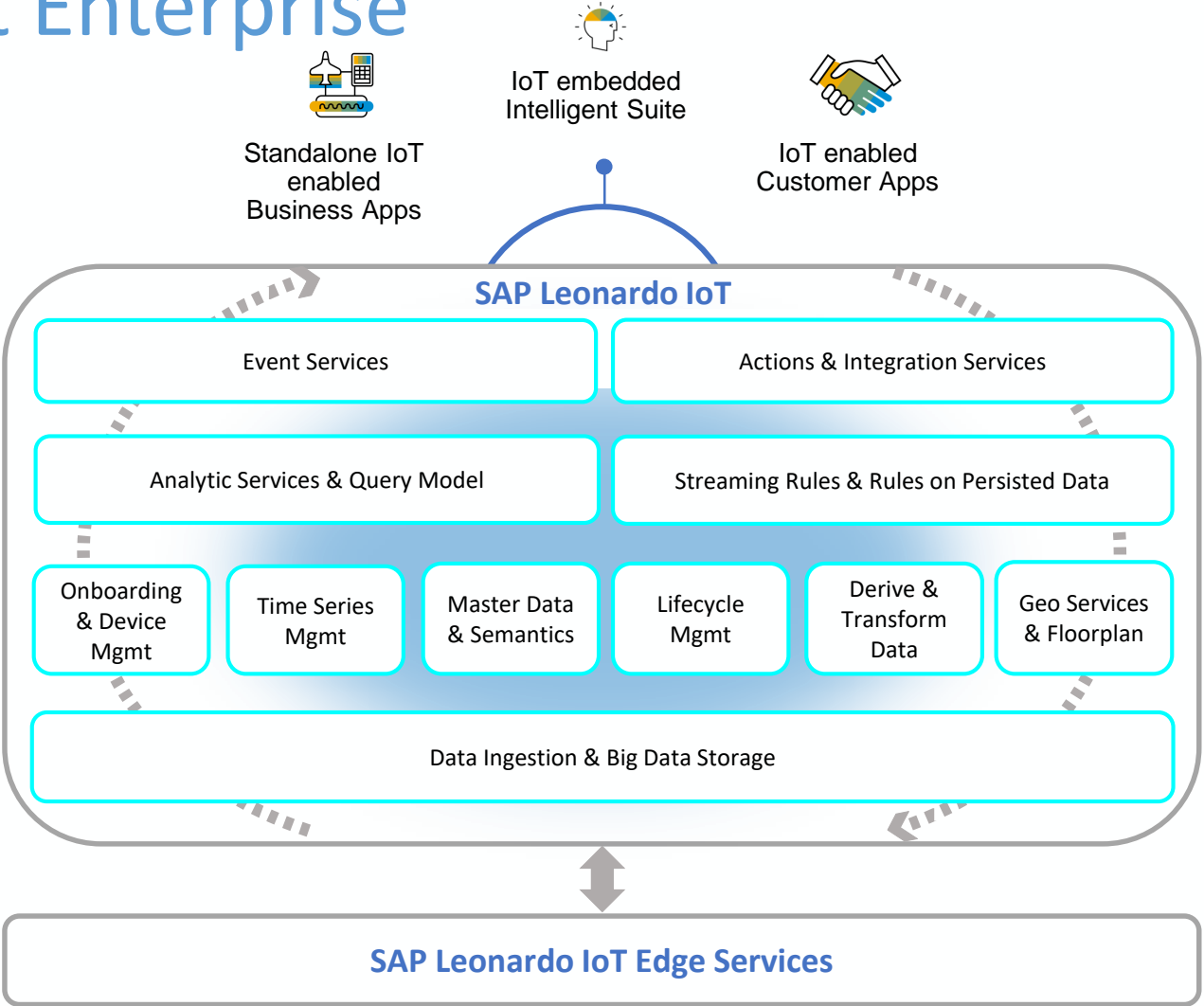
SAP Leonardo IoT
drives intelligence in 3 key areas:

3 Business Action

2 Business Insight

1 Business Context

Standalone IoT enabled Business Apps

IoT embedded Intelligent Suite

IoT enabled Customer Apps

SAP Leonardo IoT

| Event Services | Actions & Integration Services |

| Analytic Services & Query Model | Streaming Rules & Rules on Persisted Data |

| Onboarding & Device Mgmt | Time Series Mgmt | Master Data & Semantics | Lifecycle Mgmt | Derive & Transform Data | Geo Services & Floorplan |

Data Ingestion & Big Data Storage

SAP Leonardo IoT Edge Services

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Cloud-Edge Continuum
Decide where to run your workload

SAP Leonardo IoT

Cloud

Continuum

Edge

SAP Leonardo IoT Edge

Consistent Execution
Integrate into cloud or on-prem business processes

Consistent Business Rules
Apply same set of business rules in the cloud or at the edge

Consistent Business Context
Bringing contextual data to the edge
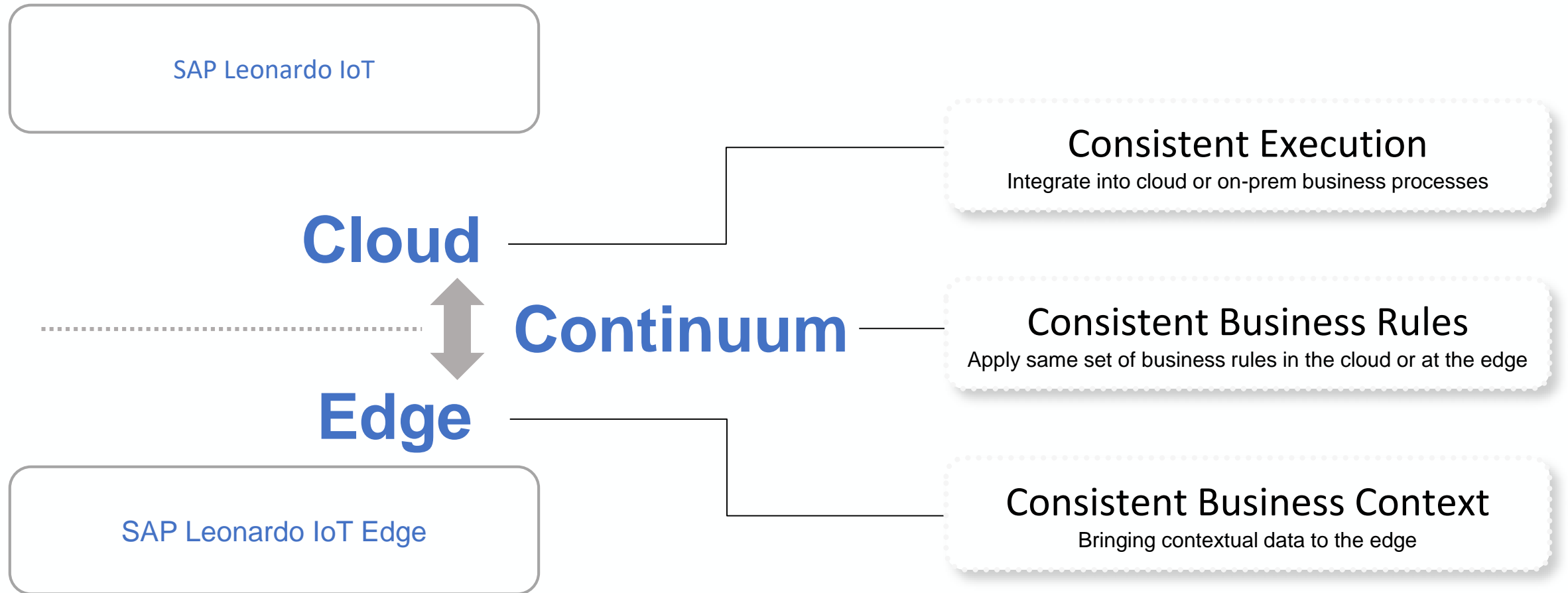
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http://info.asug.com/2019-ac-slides

Q&A

For questions after this session, contact us at bert.laws@sap.com.

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