



# SAP Leonardo Live

Not just another business conference

## SAP: IoT Technology All About Edges, Foundations, Bridges, and Services

July 12, 2017

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# Our Plan for the Next 45 Minutes

## Introduction to IoT Technology

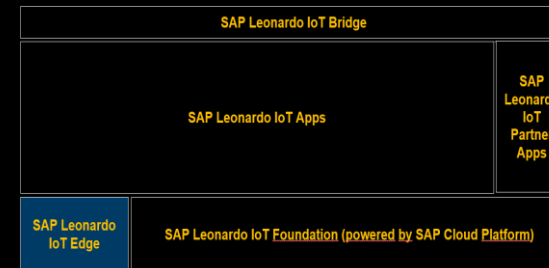
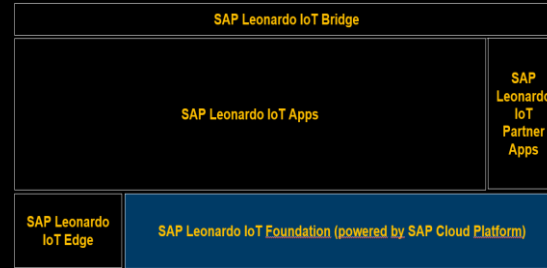
- SAP Cloud Platform Internet of Things
- SAP IoT Application Enablement
- SAP Leonardo IoT Edge
- SAP Leonardo IoT Bridge

(15 Minutes)

## Question-and-Answer Panel with Our Experts

(30 Minutes)

# Your SAP experts in the room today



Sindhu Gangadharan

Thomas Kaiser

Merlin Yamssi

Elvira Wallis

Christoph Inauen

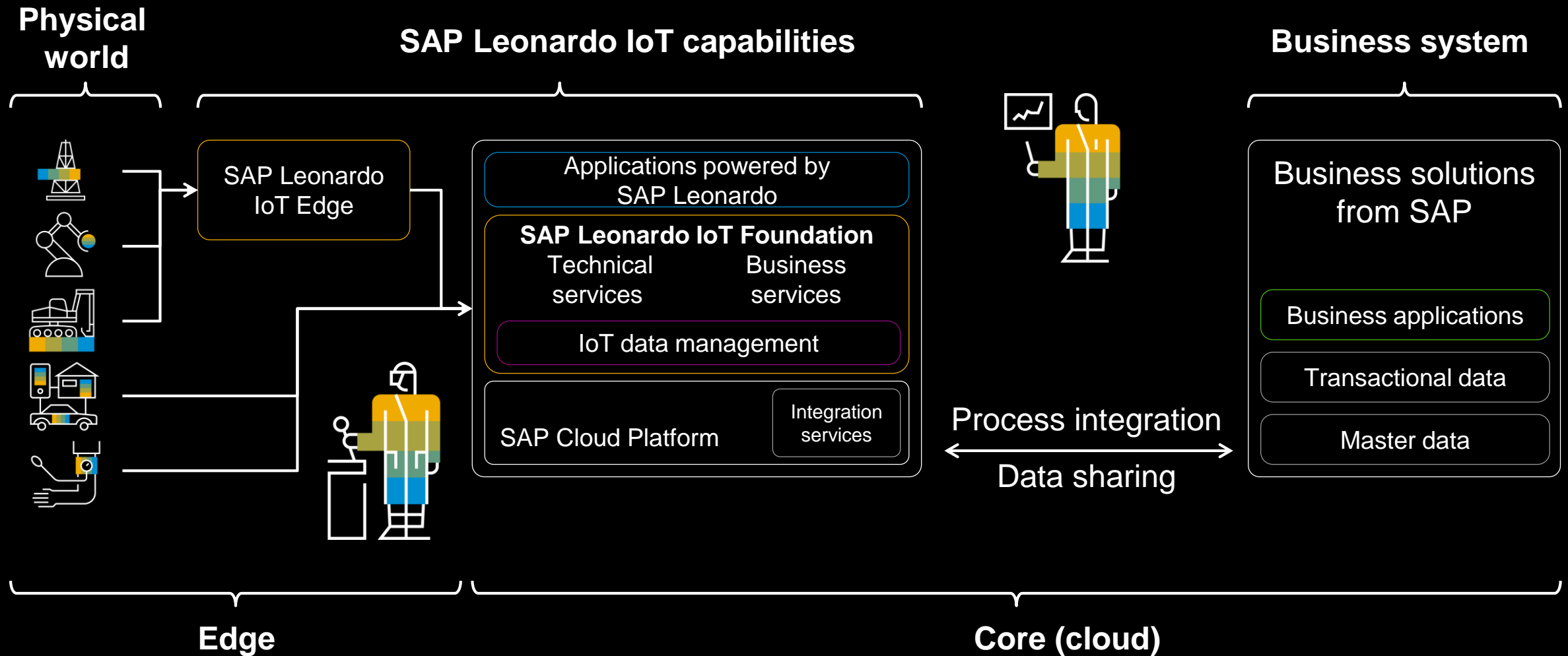
# Overview

# SAP Leonardo Internet of Things

Christoph Inauen

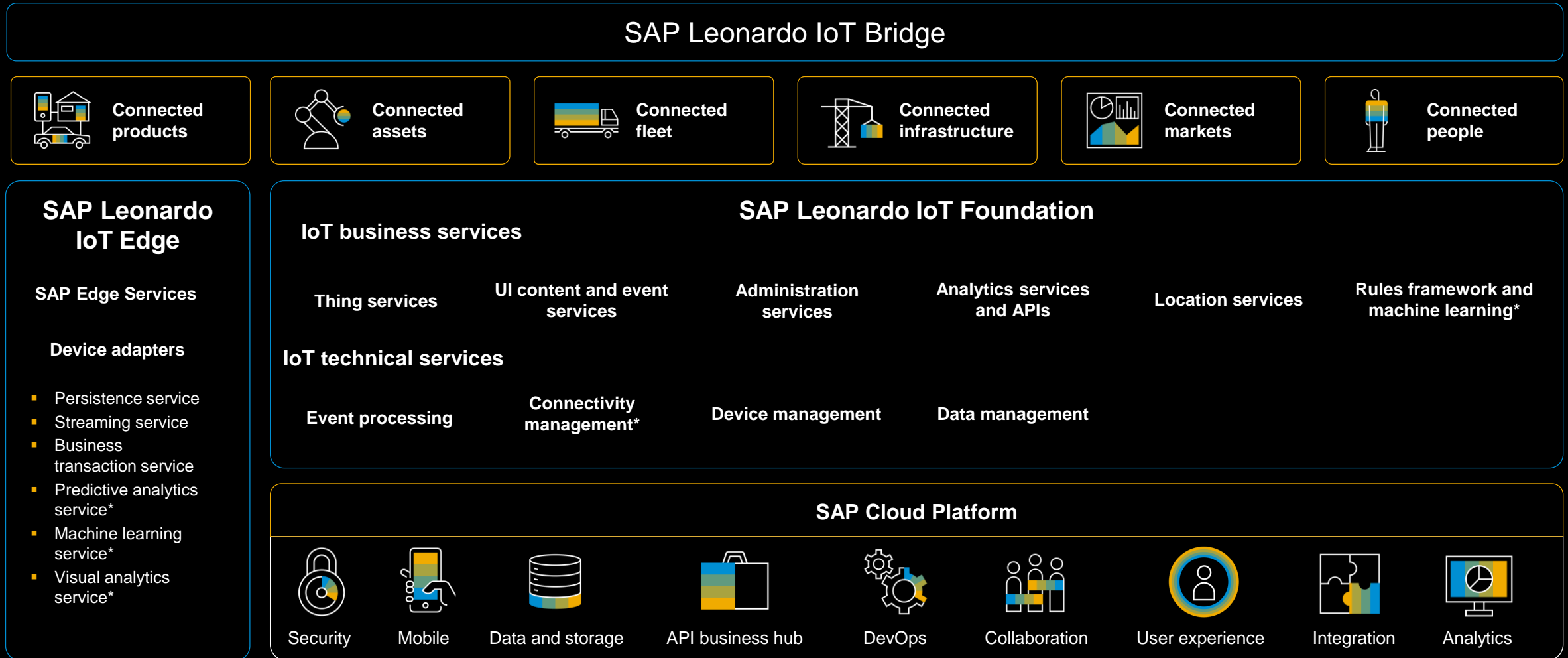
(15 minutes)

# SAP Leonardo Internet of Things (IoT)



# SAP Leonardo IoT Foundation and SAP Leonardo IoT Edge

## Capabilities view



\*Planned innovation

# **SAP Cloud Platform**

## **Internet of Things Services**

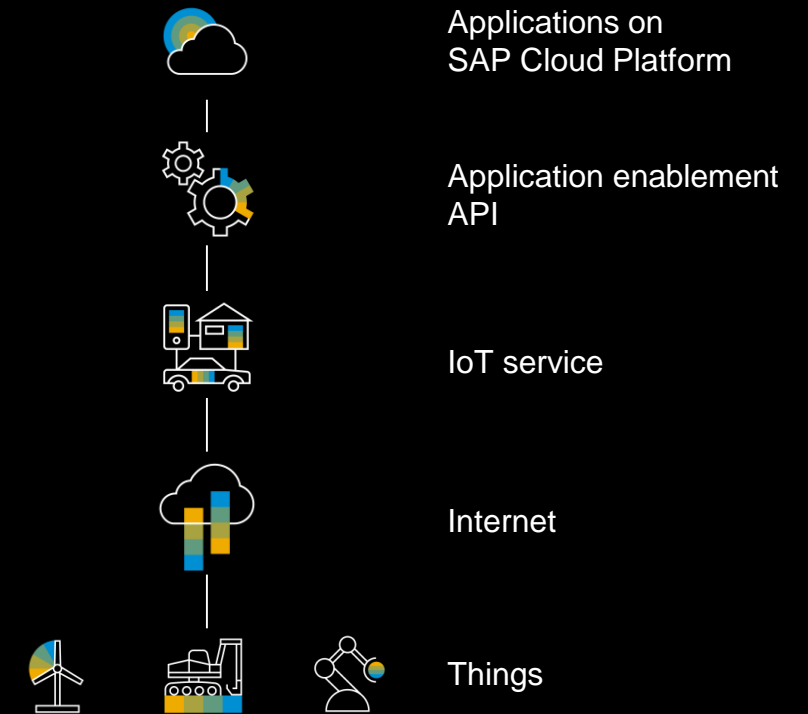


# Internet of Things

## SAP Cloud Platform Internet of Things

### Key capabilities

- IoT cockpit as the central UI for device management
- Support for receiving device data and sending commands to remote devices
- REST APIs for device modeling and data consumption
- Notification management (alerts/rules/events)
- Certificate-based onboarding and authentication of devices to IoT gateway (edge and cloud)
- Support for various gateway protocols (such as HTTP [REST], MQTT, CoAP, SNMP, ModBus, Zigbee, XMPP)
- SDK for development of custom protocol adapters and custom filters (interceptors) on IoT gateway edge
- Integration with SAP IoT Application Enablement
- Quick start using guidelines, tutorials, and code examples coming with the starter kit for the SAP Cloud Platform Internet of Things publicly available on GitHub



Read more:  
[SAP Cloud Platform IoT](#)

**SAP Cloud Platform**

**SAP IoT Application Enablement**

# Manage the digital twin

Thing data, hierarchies, time series, and events

## Thing hierarchies

- Structure
- Hierarchy
- Relationships

## Thing packages

- Flexible usage in different applications
- Thing configurations



## Thing data

- Basic data
- Properties
- Status
- Documents and specifications

## Time series and events

- Measurements
- Thresholds
- Error codes
- Alerts

**Thing Type**  
Kaiser CSG 55-2 Screw Compressor  
Last Change: 05/12/2016

Basic Data | Time Series | Component Types | Statuses | Media | Documents | Connectivity

Name: Kaiser CSG 55-2 Screw Compressor  
Description: Air- / water-cooled dry runner, 37 kW

Category / Attribute	Value	Unit of Measure	Type	Length	
Carriage large					
Primary color	Signal Black	RAL	Text	30	
Secondary color	Yellow	RAL	Text	30	
Number of doors	3		Number	2	
Dimensions CSG 55-2					
Width	2355	mm	Number	10	
Depth	1660	mm	Number	10	
Height	2145	mm	Number	10	
Motor Air 4					
Rated motor power	37	kW	Number	5	
Max. operating pressure	4	bar	Number	5	
Cooler version	Air-cooled		Text	20	
Sound pressure level	71	db(A)	Number	5	
Others					

SAP IoT Application Enablement includes microservices and reusable 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.

# Developer experience

The IoT developer experience is a set of tools, content, and knowledge helping customers and partners to build great apps faster

3

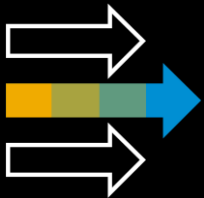


User interfaces

IoT applications

- Web-based development environment
- IoT project templates and UI components
- Rules modeler
- KPI modeler

2



Mash-up services

IoT mash-up service

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

1



Microservices

IoT application services

- Thing model
- Business partner authorization
- Partner and customer's own microservices

# **SAP Cloud Platform**

## **SAP Edge Services**

# Drivers for edge computing

Data volume/  
bandwidth  
capacity



Intermittent  
connectivity



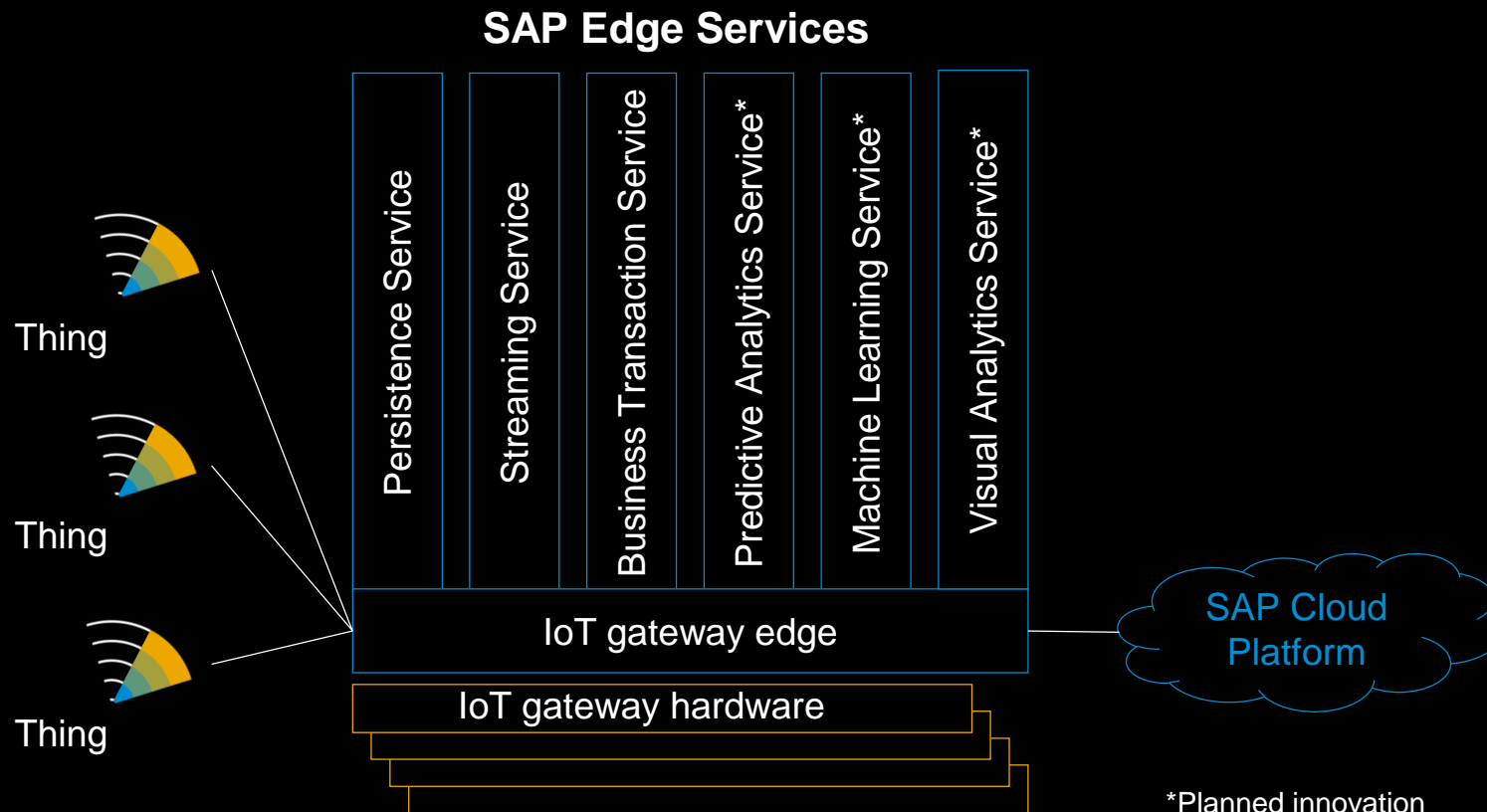
Real-time  
decision  
making



# SAP Leonardo IoT Edge

The programming model for IoT is shifting from being cloud centric to a distributed edge-cloud model.

IoT data will be stored, processed, analyzed, and acted upon at the edge.



- **Persistence service** – locally store IoT data on IoT gateways
- **Streaming service** – analyze IoT data streams, finding exceptions and patterns in incoming IoT data stream and creating events and alerts
- **Business essential services** – execute business processes at the edge to provide continuity for critical business functions even when the edge is disconnected from the core (plant maintenance, inventory/ materials management)
- **Predictive service\*** – use predictive models for analyzing IoT data. The predictive algorithm is trained in the core based on all available data. The resulting predictive model is then sent to the edge and applied there.
- **Machine learning service\*** – apply machine learning algorithms at the edge specifically for image and video analysis
- **Visual analytics service\*** – explore visually IoT data stored on IoT gateways. IoT data analysts can visually inspect the data collected at the edge.
- **Device adaptors** – data format conversion across a multitude of IoT device protocols; secure data transmission with SAP Cloud Platform

**SAP Cloud Platform**

**SAP Leonardo IoT Bridge**



# SAP Leonardo IoT Bridge

“ SAP Leonardo IoT Bridge brings your business operations together into a **single collaborative work environment for people, things, and business processes**, leveraging the Internet of Things. ”



# Scenario – outbound logistics

## Overview page

### Scenarios

Value chain collaboration

### Personas

Empowered users

### Cards

Situational assessment

### Services

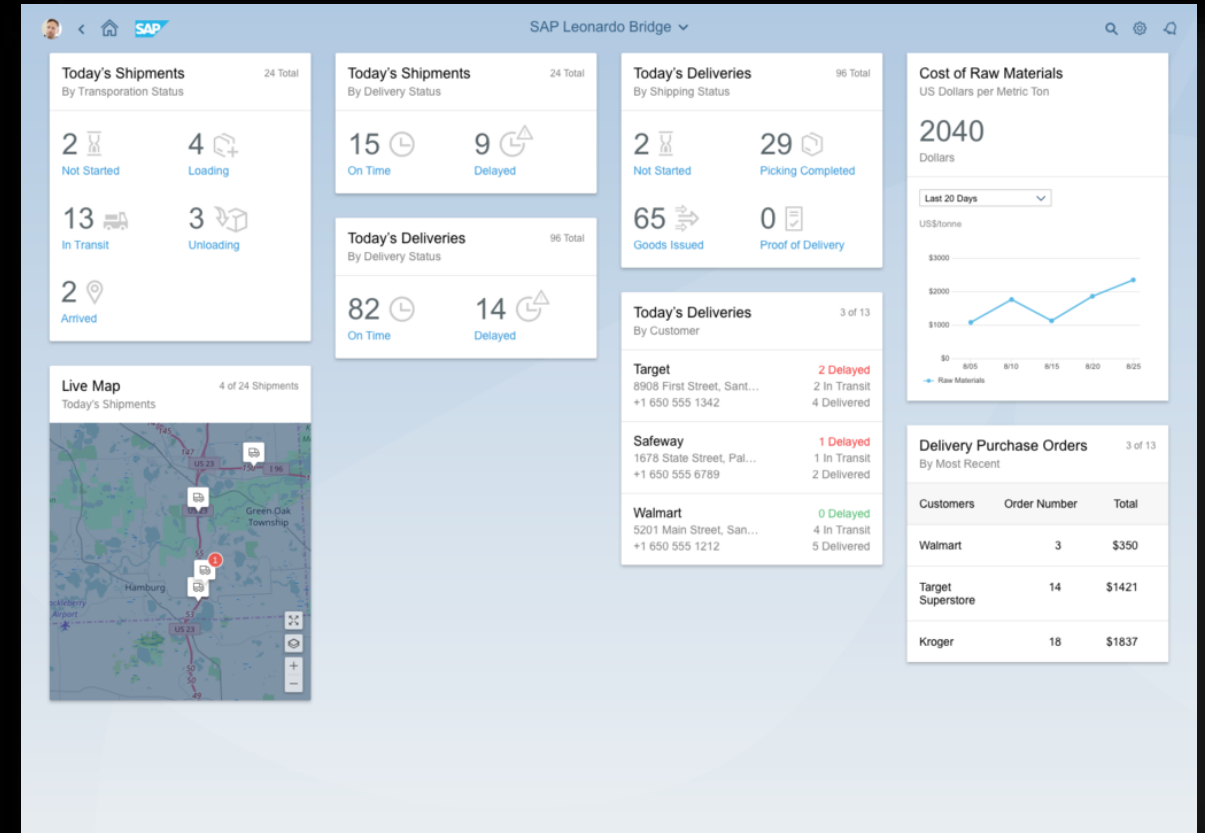
Insight to all available data

### Events/Notifications

Preventative capabilities

### Resolution support

Prescriptive guidance





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