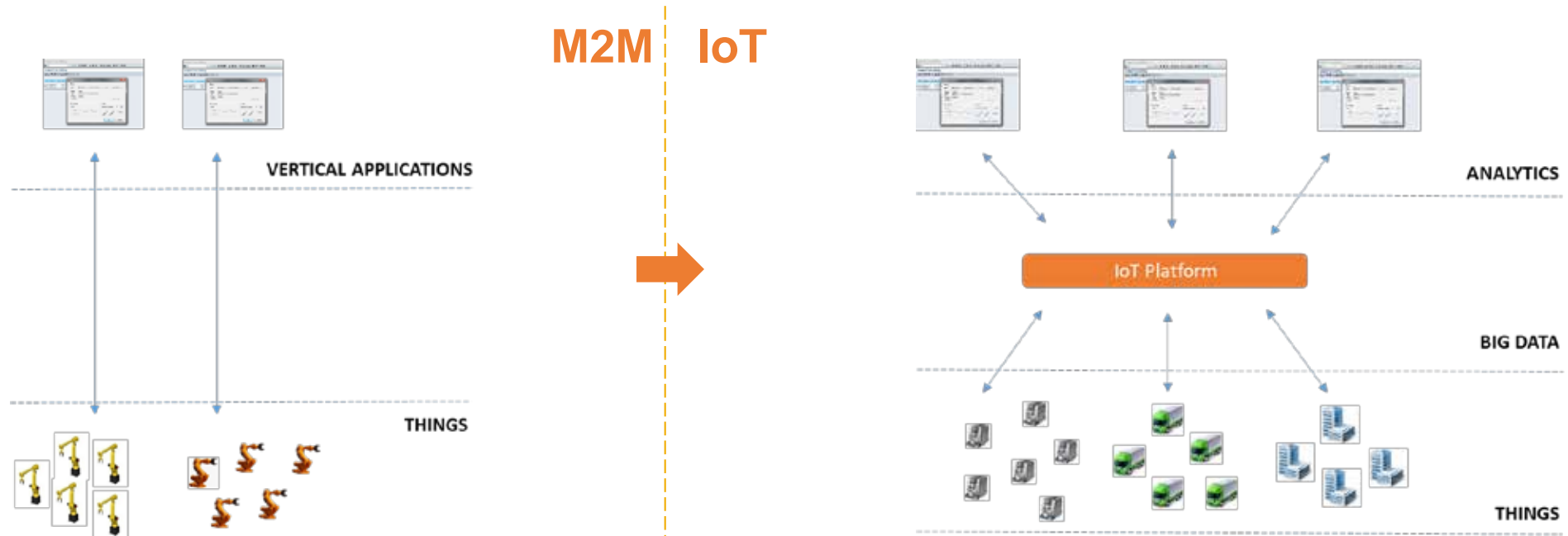




# IMA @Connected Machine

Angelo Zerega  
Senior Technical Sales Specialist: IoT - Industry 4.0 - Digital Transformation

# ABO DATA History



- ABO DATA  
Founded  
in Genoa, Italy
- Core business  
focused on  
embedded systems
- Developments  
on PLAT.ONE  
begin
- PLAT.ONE  
product launch
- PLAT.ONE  
spin out from  
ABO DATA
- SAP acquires  
PLAT.ONE  
ABO DATA becomes  
a SAP Partner
- 6 new  
customers on  
SAP Leonardo  
IoT Services

# ABO DATA Some References



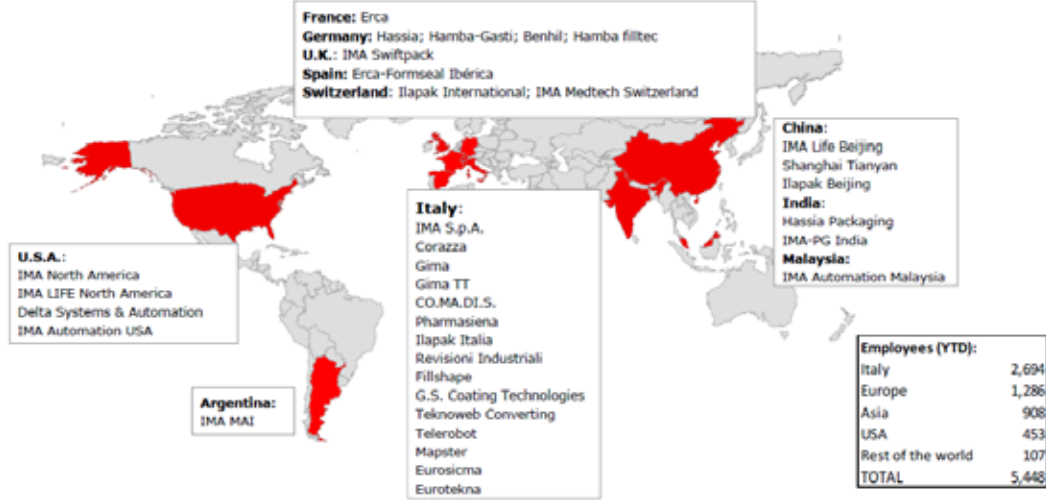


## IMA at a glance

- IMA is world leader in the design and manufacture of automatic machines for the processing and packaging of pharmaceuticals, cosmetics, food, tea and coffee and tobacco
- More than 5,400 employees, about 2,800 of whom based abroad (YTD)
- In 2017 € 1,444.7 millions worldwide sales, of which more than 88% outside Italy
- World-wide sales and service network
- More than 1,600 patents worldwide
- Established in 1961, IMA S.p.A. has been listed on the Milan Stock Exchange since 1995 and in 2001 joined the STAR segment

**Production Plants**

IMA manufactures equipment in 41 production plants located in Italy, Germany, France, Switzerland, Spain, UK, USA, India, Malaysia, China, Argentina.



**Sales Representatives**

Presence in about 80 countries with headquarters in Italy, branches in Europe, Middle East, North America, South America, Asia and representative offices in Central and East Europe and more than 50 local agents.



**After Sales Assistance**

IMA provides world-wide technical assistance through its headquarters in Italy, branch and local agents.

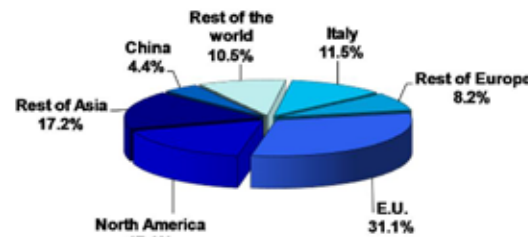
**Revenue Sources**

- Significant share of the Group's earnings generated by after-sale services, spare parts and equipment, which are higher-margin and recurring in nature (30% of overall revenue)
- Geographically well diversified revenue sources

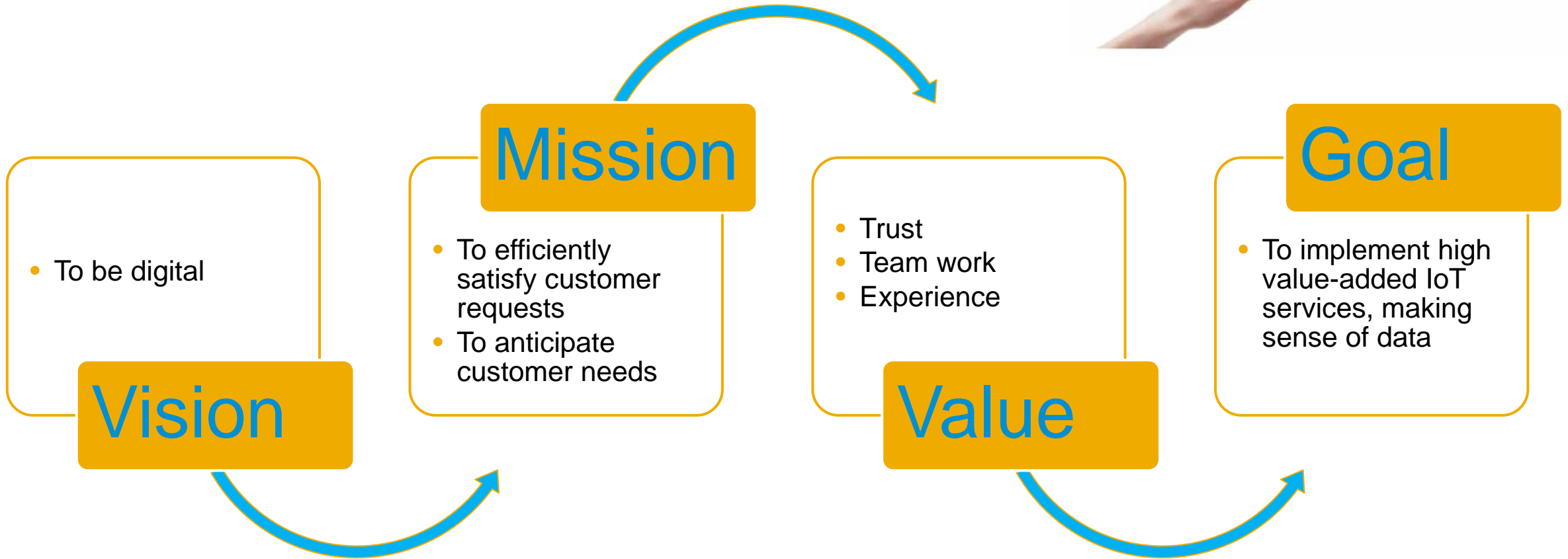
**Revenue by Nature 2017**



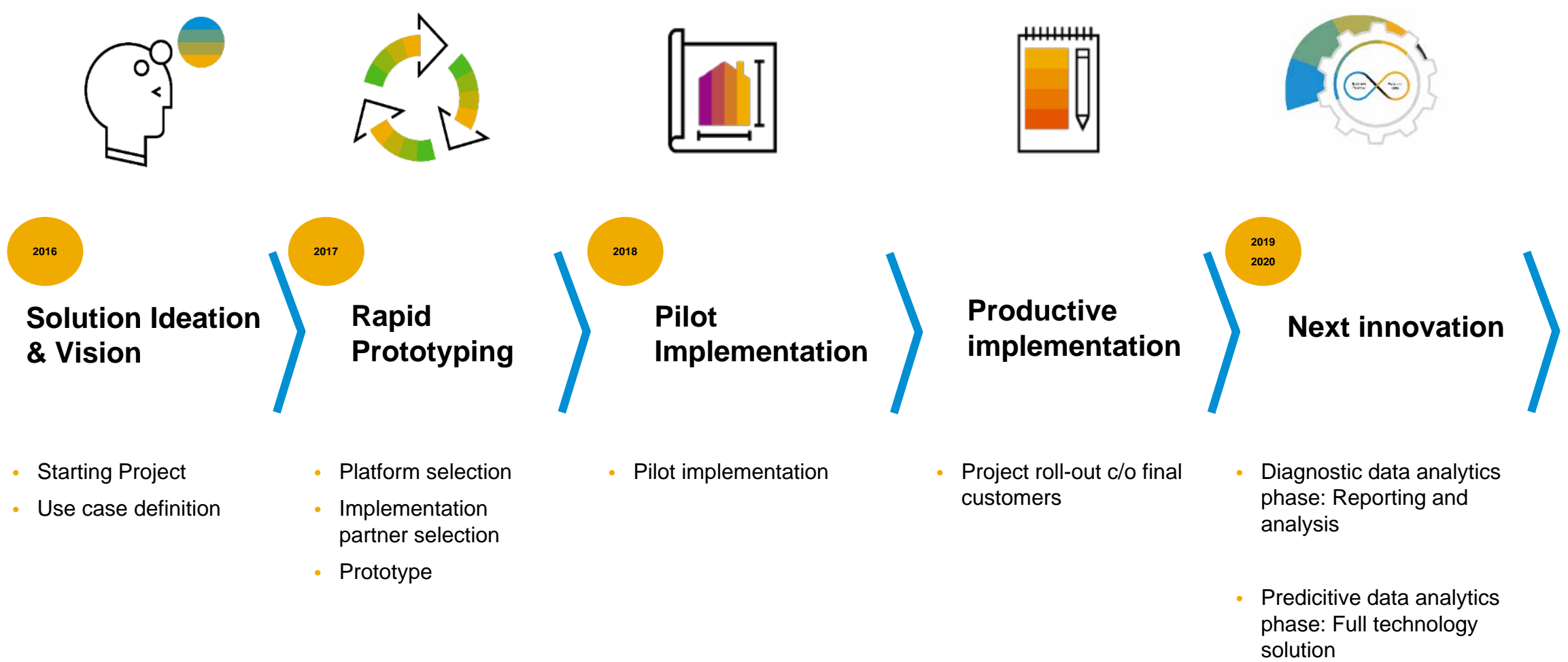
**Revenue by Geography 2017**



# IMA DIGITAL: Vision, mission, value and goal



# IoT project roadmap for IMA





# Rapid Prototyping: Use case definition

Implementation of an IoT technological platform able to collect data from IMA machines, in order to remotely **monitor** production and facilitate services or to **predict** maintenance needs.

## Opportunity

- Identifying high value added IoT services fitting with the vast majority of IMA equipments
- Given the large amount of collectable data, **making sense** of output data



## Solution

An architecture in a cloud-based or on-premise scenario able to output data that will be visualized through **dashboards**

### IMA Project Team



IT dept



R&D dept

### IMA Pilot Divisions



UTE & UTM dept

IMA Active

IMA Life

IMA GIMA

IMA

Tea&Herbs

IMA Safe





# Rapid Prototyping: IMA selected SAP LEONARDO PLATFORM

## SAP Cloud Platform Internet of Things

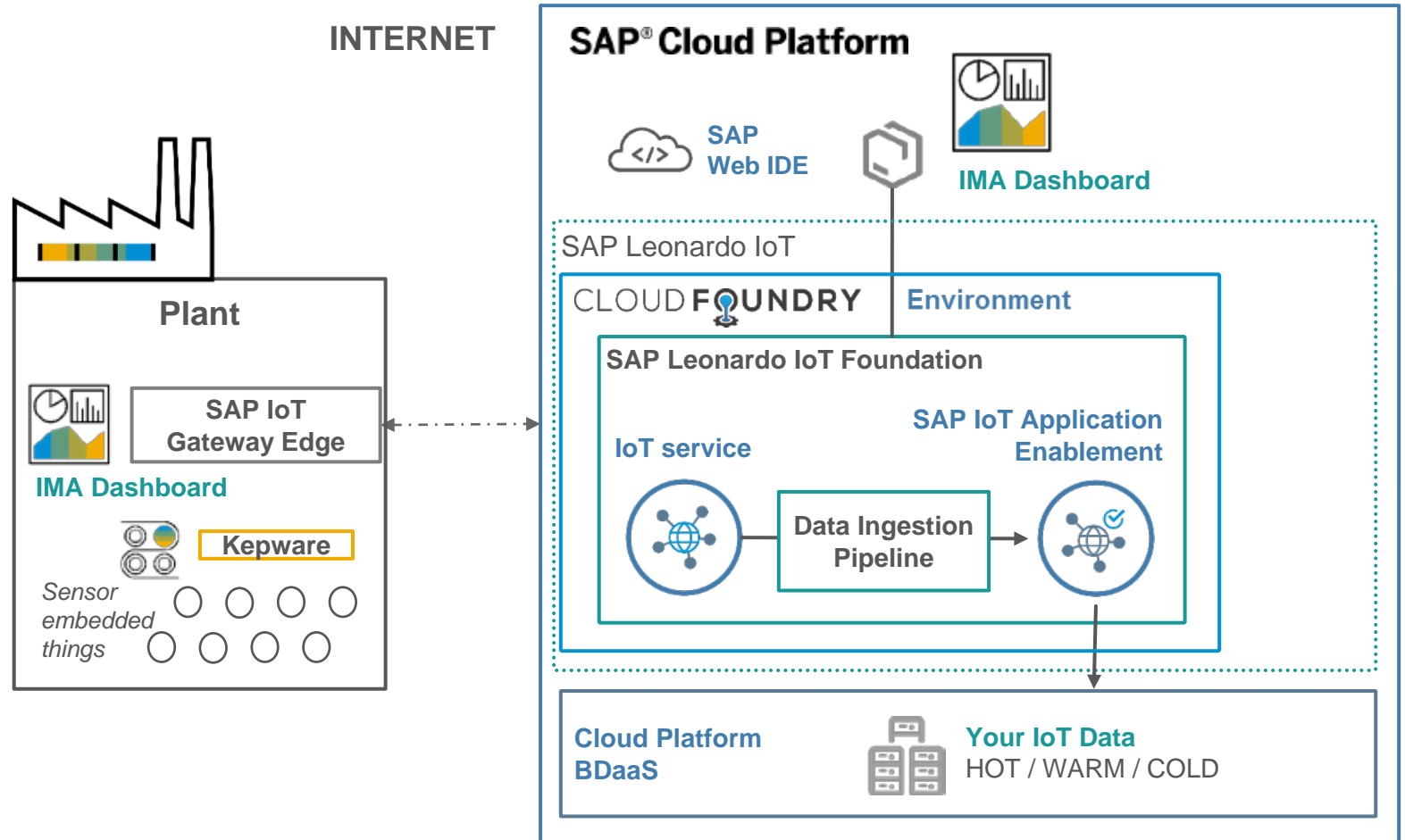
- Device lifecycle management
- IoT Gateway for data pre-processing
- IoT protocol support

## SAP Edge Services

- Compute
- Storage
- Business critical functions

## SAP IoT Application Enablement

- Digital twin builder
- IoT app development & mashup
- Data management





# POC & Pilot Implementation: Connected Machines Pilot Project

## Project details

### Incremental delivery approach

16 weeks timeline



#### Proof of Concept deliverables

- Connected Machine use case dashboard
- Control Room use case dashboard
- Condition Monitoring
- Patterns identification (alarms)
- IoT Analytics
- Customer use cases

#### Pilot Project

- 2 different machines selected
- Increased reliability in case of local network, server, or cloud connection service interruptions data continues to be collected and buffered by the Edge, which will automatically retransmit data to the cloud when it comes back available

#### Production co-innovation

- The asset producer agree with a Pilot Customer on how to enhance the solution

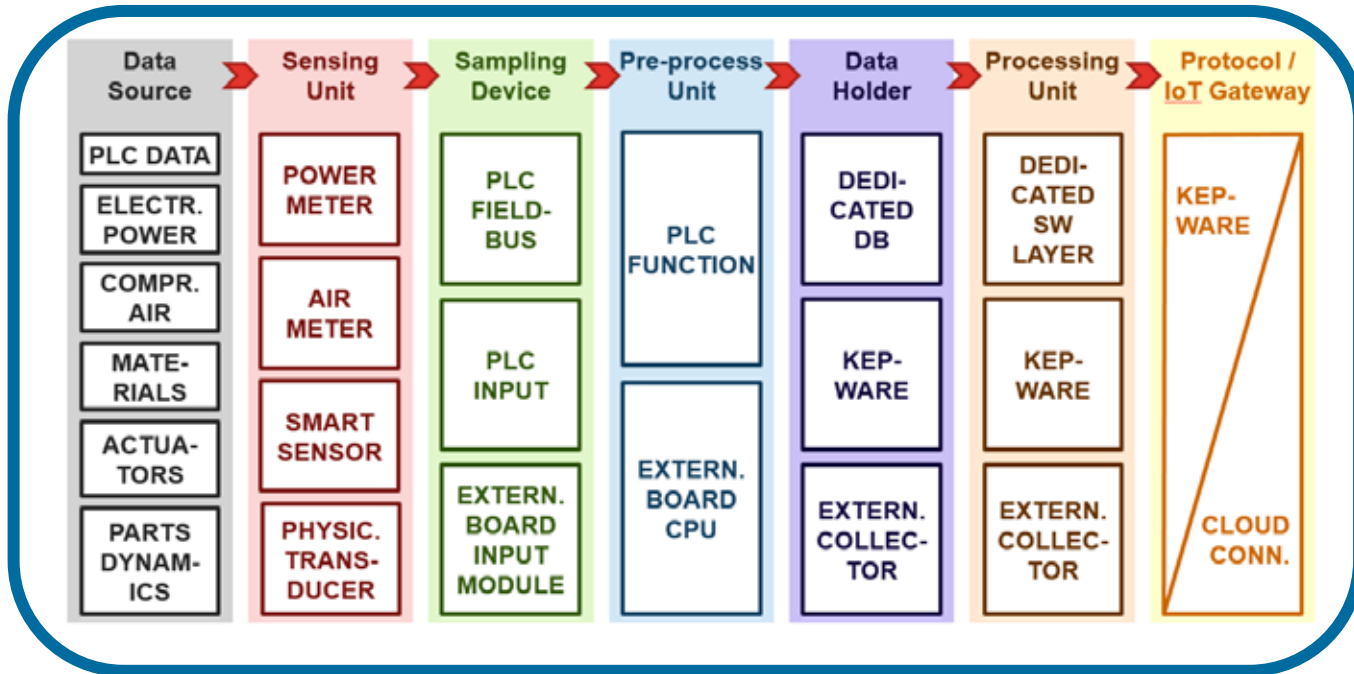
## IMA

### Project and SAP experience feedback

- After 4 months of platform selection, IMA has chosen SAP LEONARDO PLATFORM as it has been considered valid in all parameterization phases. The competitor's ones are only development platforms.
- Only SAP DBS has able to deliver:
  - A first artifact as POC in only 3 weeks
  - A first productive deliverable in 8 weeks
  - 4 more enhancement packages planned every 2/3 weeks
- SAP DBS, for IMA, has been reliable as right implementation partner able to identify standard functionalities or custom, in case. Even using the related partner network to find the right skills.
- IMA has very appreciated the right reaction time, during project implementation, to solve any issue involving the Product development teams too
- SAP DBS has been able to cover the specific request to transfer the right knowledge to IMA during project implementation. Now the IMA team has a good level of independency for the next development.

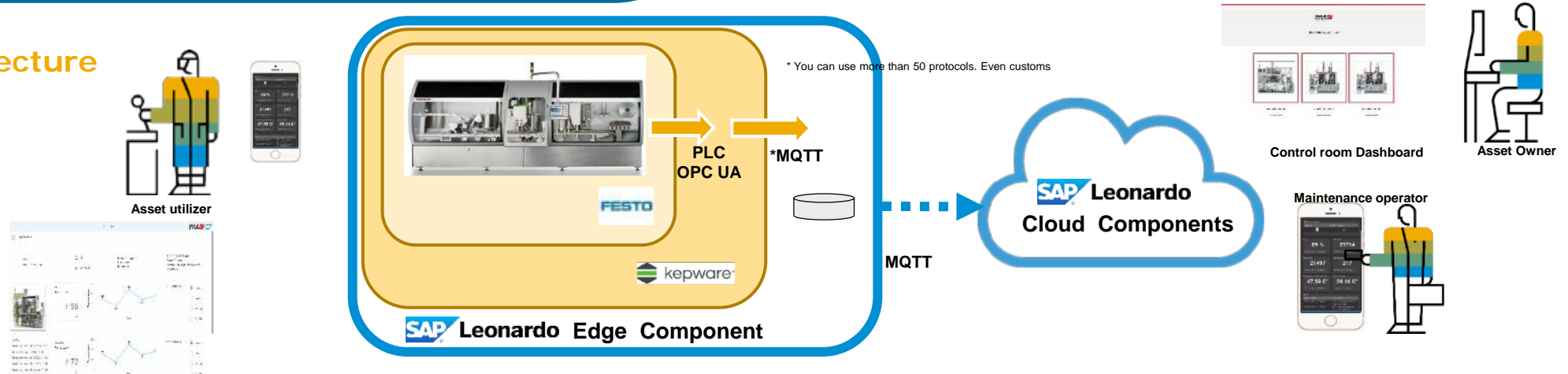


# Pilot Implementation: Connected Machines Pilot Project



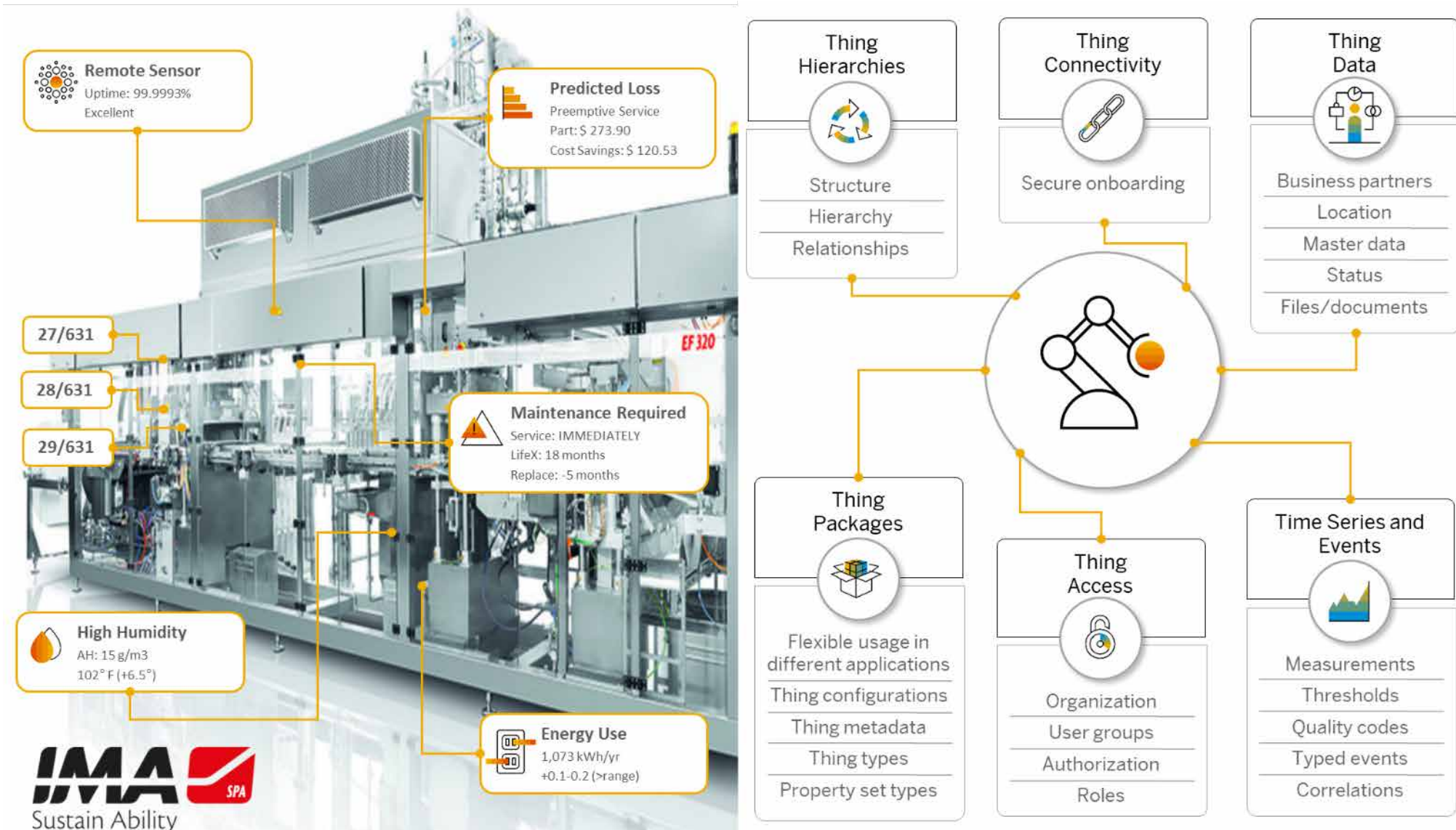
Conceptual architecture model (device side)

## Main technical architecture





# Pilot Implementation: Connected Machines Pilot Project





# Pilot Implementation: Connected Machines Pilot Project

## THE SOLUTION

The asset producer

- **Secure connections:** secure asset-to-platform communication and integration (sense – connect – transform)
- **Intelligence “on the edge”:** local event processing and filtering (alarms are triggered based on configurable thresholds and event modeling)
- **Pro-active maintenance:** fact-based, accurate predictions, turned into insights for actionable decision making (predict asset behavior via algorithms learning from historical data and data correlation patterns)

The asset utilizer

- **Open, multi-protocol architecture:** multiple device/machine integration protocol support enable multi-vendor asset monitoring
- **Real Time monitoring and control:** filtering of relevant machine data and critical measures (Downtime and KPIs - OEE)
- **Transparency:** tracking of actual work hours at asset level is consolidated in different views (lines, plant, region, country, ..) to provide the required level of visibility based on User roles

The asset maintainer

- **Responsive and tailored User Interface:** base on device and user role profiles, information are presented with different layouts

## THE POSSIBLE IMPACT

**New business models and changing schema,** including maintenance services

- pay as you go, per operating time
- full rental service

**Remote management and control of owned assets**

- provide insights to R&D department
- recommendations for better asset usage

**Trouble-less asset usage - production operations**

- Reduced number of outages
- Reduced downtime

**Optimized asset provisioning and maintenance**

- Discounted price for multiyear, full service contracts
- Cost variabilization (from CAPEX to OPEX)

**Increased Revenue from prepaid Maintenance**

- Improved “Order 2 Cash”
- multi year pre-paid maintenance contracts

**Cost effective Field Workforce Operations**

- Optimized scheduling of planned maintenance
- Guided procedures and insights to maintenance operators

## THE OUTCOMES

Asset Availability:

**Reduced  
Unplanned  
Downtime**



**Improved OEE**

(Overall Equipment Effectiveness):

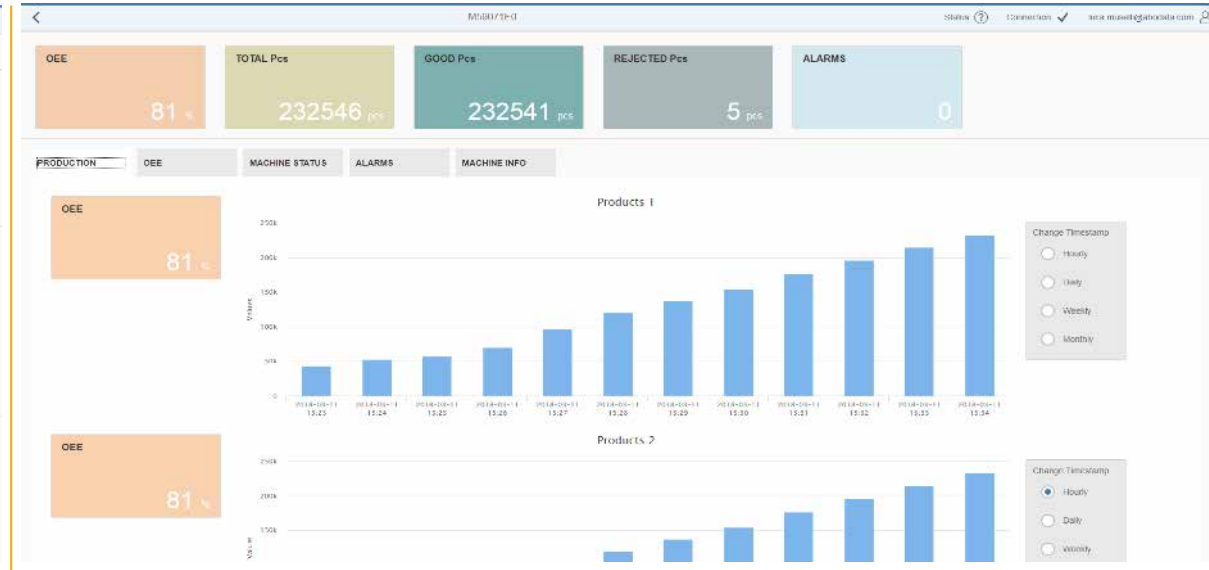
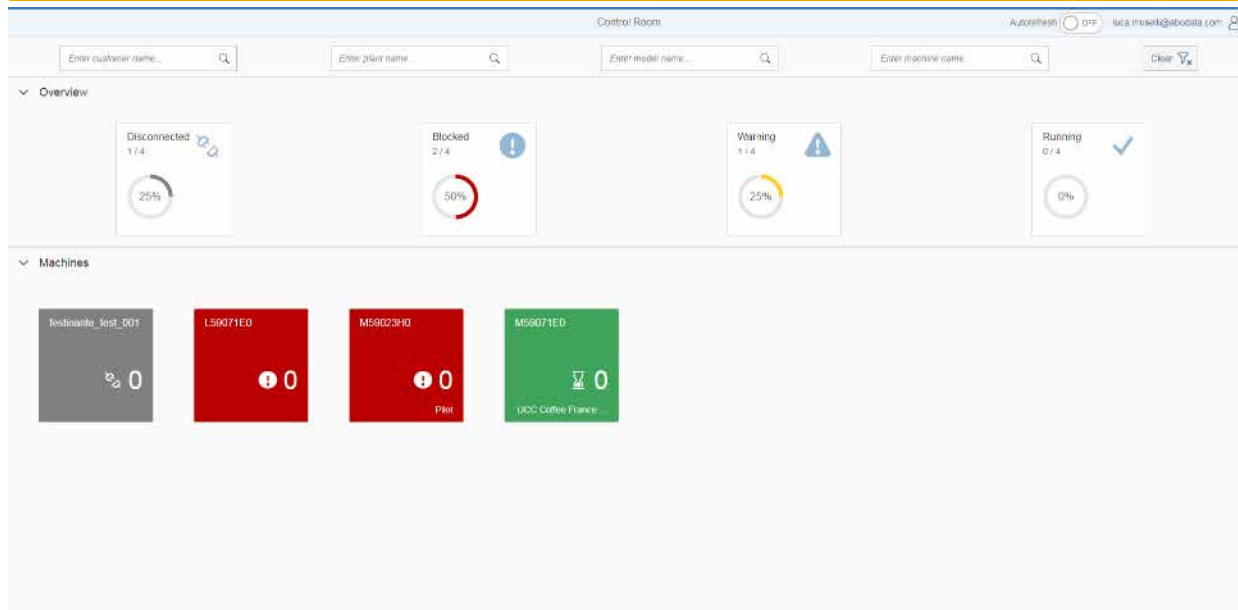
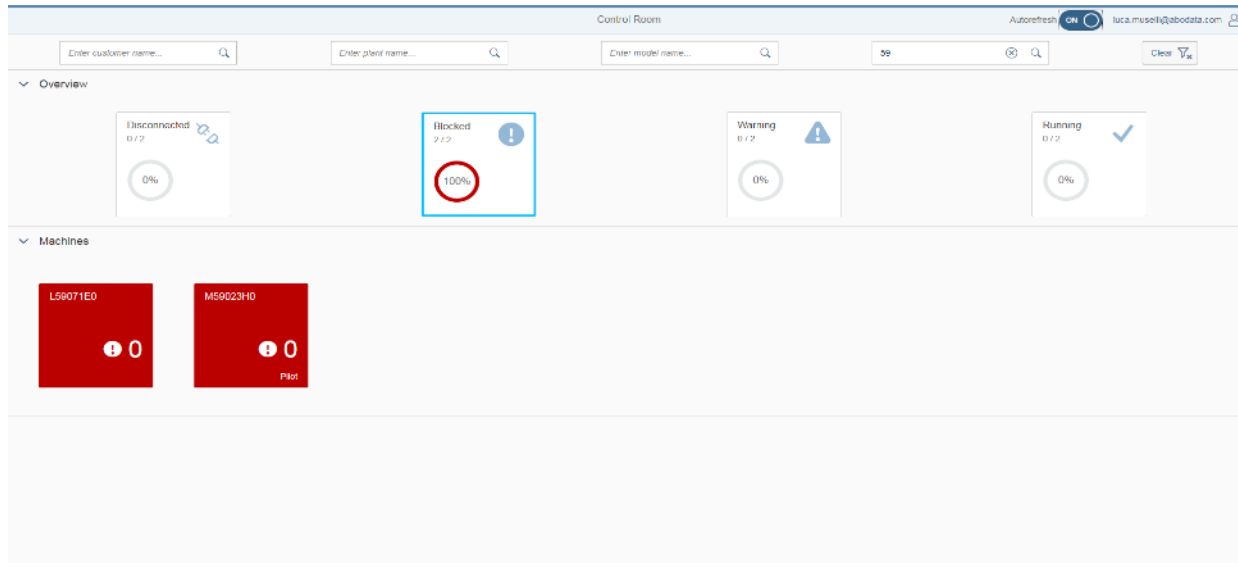


**Increase  
Maintenance  
Revenues**





# Pilot Implementation: Control room dashboard for IMA

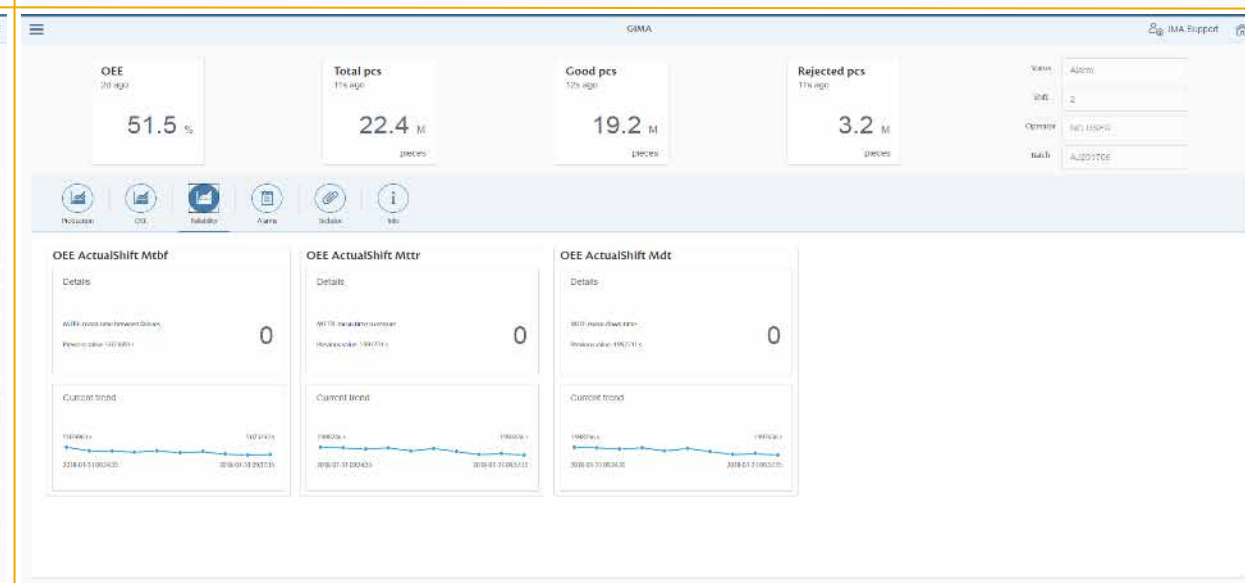
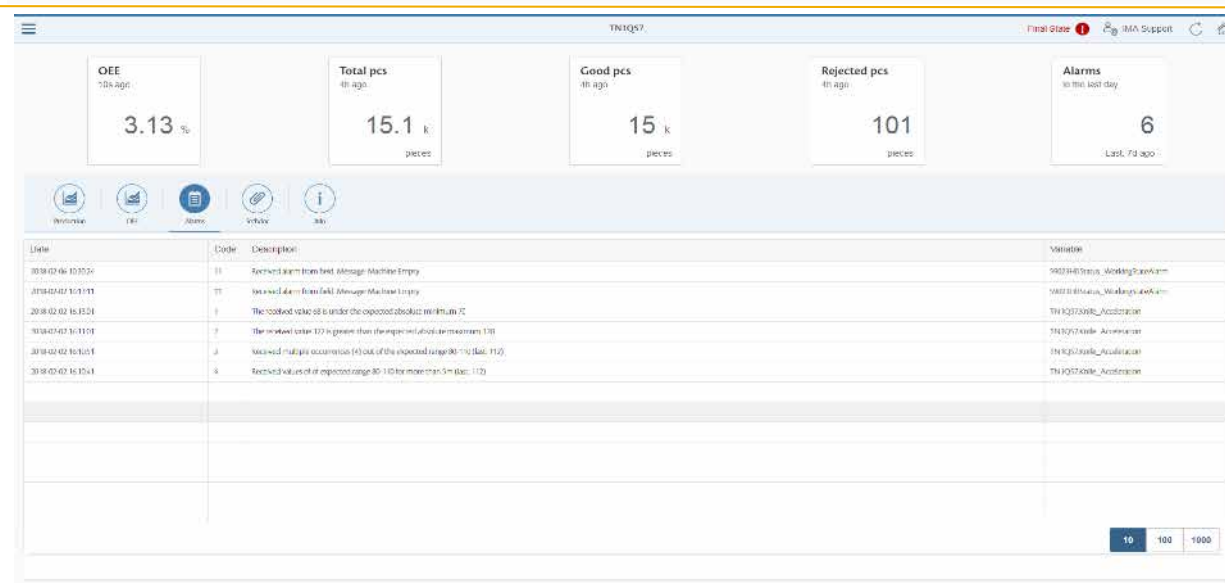
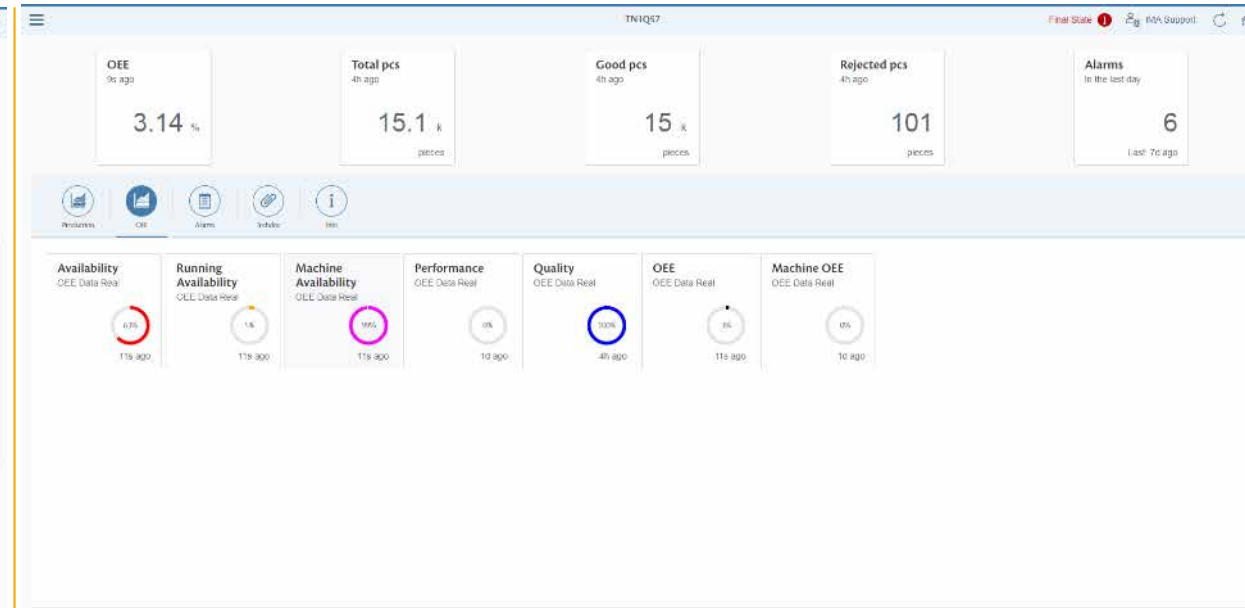
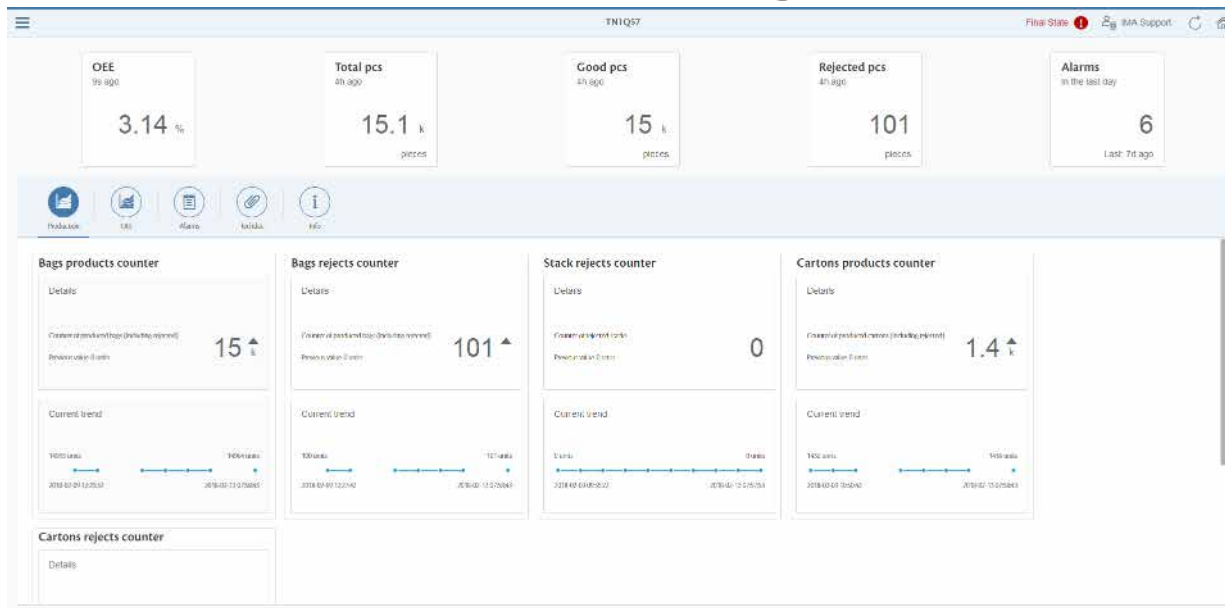


The screenshot shows the 'M56071E0' machine dashboard with the 'ALARMS' tab selected. It displays a table of alarm events with columns for Date, Code, Description, and Variable.

Date	Code	Description	Variable
2018-03-08T14:07:20.627Z	028	Received alarm from field. Message: Axes_Not_All_Enabled	56071E0.Status_WorkingStateAlarm
2018-03-08T14:06:29.096Z	008	Received alarm from field. Message: Machine empty	56071E0.Status_WorkingStateAlarm
2018-03-08T14:03:49.512Z	1317	Received alarm from field. Message: DownstreamMachine	56071E0.Status_WorkingStateAlarm
2018-03-08T14:02:09.399Z	028	Received alarm from field. Message: Axes_Not_All_Enabled	56071E0.Status_WorkingStateAlarm
2018-03-08T14:01:19.611Z	012	Received alarm from field. Message: Stop button pressed	56071E0.Status_WorkingStateAlarm
2018-03-08T13:59:39.577Z	012	Received alarm from field. Message: Stop button pressed	56071E0.Status_WorkingStateAlarm
2018-03-08T13:05:10.403Z	028	Received alarm from field. Message: Axes_Not_All_Enabled	56071E0.Status_WorkingStateAlarm
2018-03-08T13:05:09.293Z	960	Received alarm from field. Message: L6.1 present on repair	56071E0.Status_WorkingStateAlarm
2018-03-08T13:03:49.386Z	028	Received alarm from field. Message: Axes_Not_All_Enabled	56071E0.Status_WorkingStateAlarm
2018-03-08T13:02:19.307Z	028	Received alarm from field. Message: Axes_Not_All_Enabled	56071E0.Status_WorkingStateAlarm
2018-03-08T13:01:49.202Z	960	Received alarm from field. Message: L6.1 present on repair	56071E0.Status_WorkingStateAlarm
2018-03-08T13:48:30.333Z	028	Received alarm from field. Message: Axes_Not_All_Enabled	56071E0.Status_WorkingStateAlarm
2018-03-08T13:47:30.291Z	028	Received alarm from field. Message: Axes_Not_All_Enabled	56071E0.Status_WorkingStateAlarm

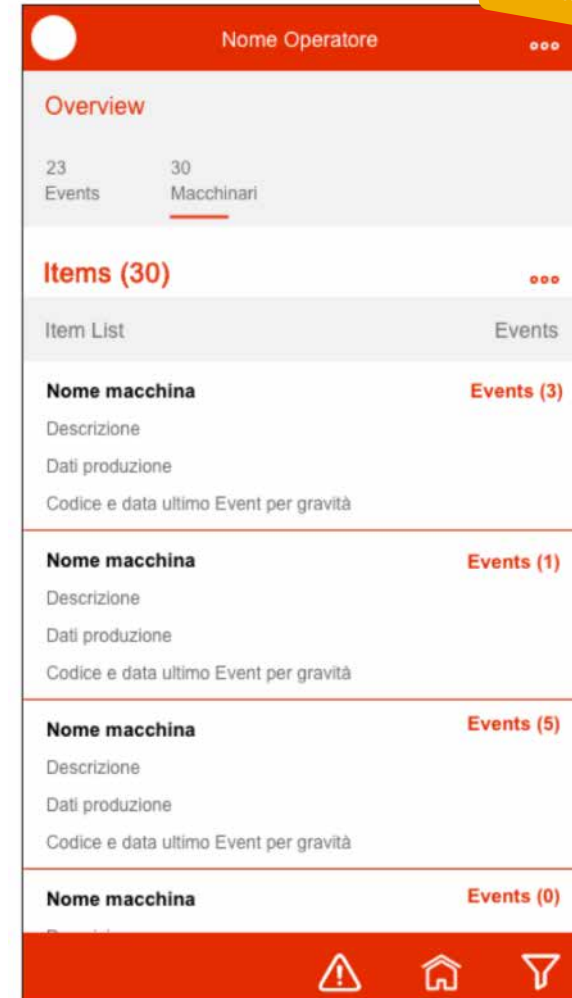
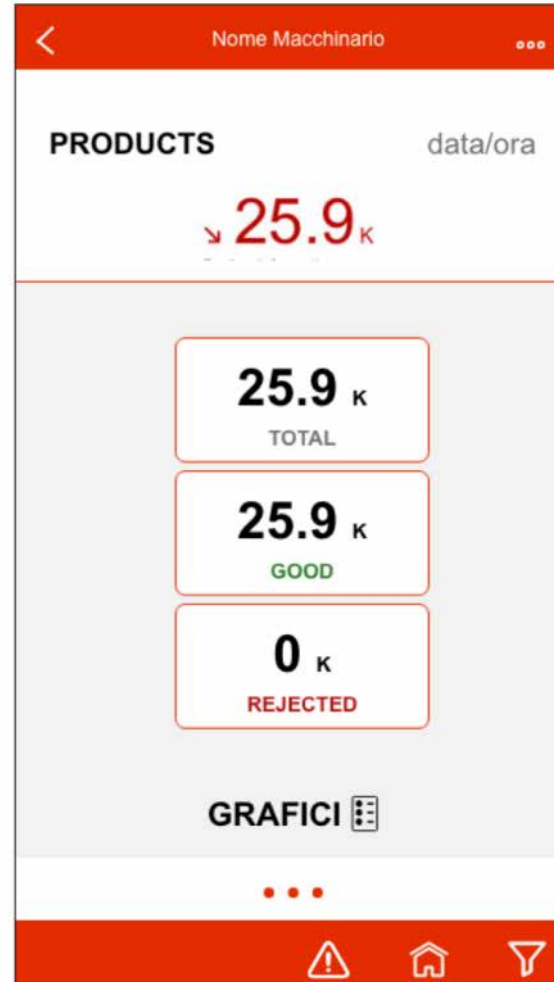


# Pilot Implementation: Edge dashboard for IMA customer





# Pilot Implementation: Mobile dashboard for IMA and customer



Not completed yet

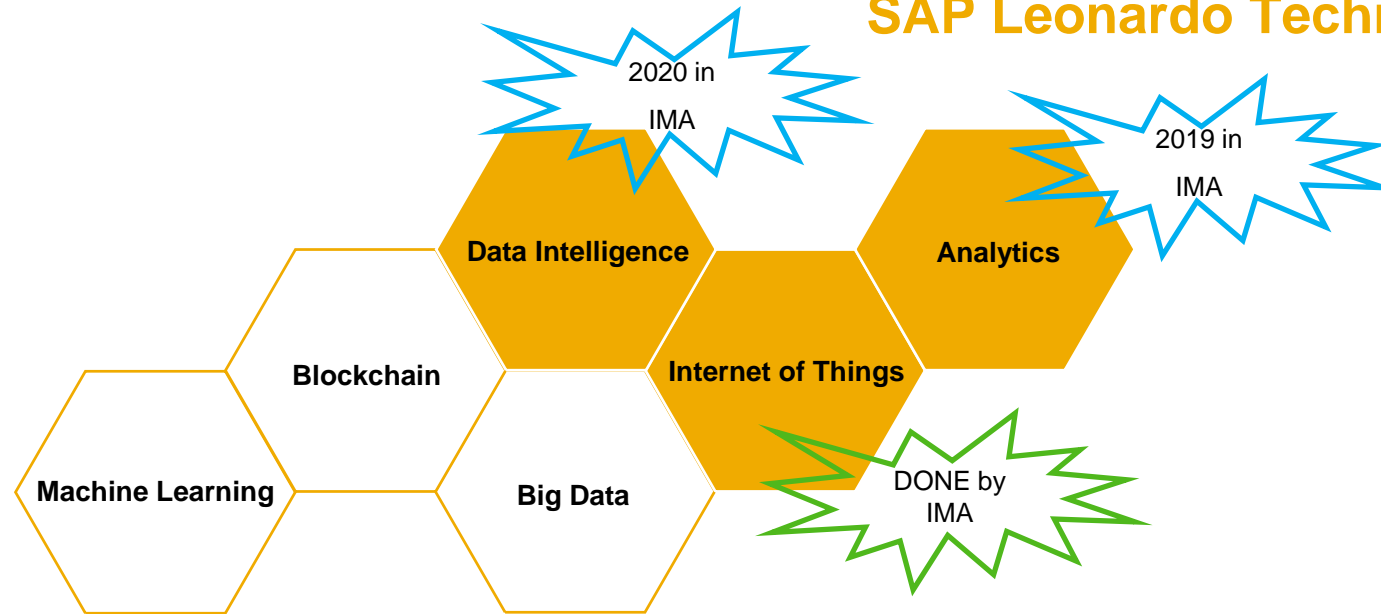


# SAP Leonardo Digital Innovation System



## SAP Leonardo Technologies

Next steps for IMA



### 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



Microsoft Azure



THANKS

