

# Accelerating Innovation in the Industrial Internet of Things

Manish Yashvant  
Dir. Strategic Alliances, PTC

# STATE OF INDUSTRIAL INNOVATION SERIES

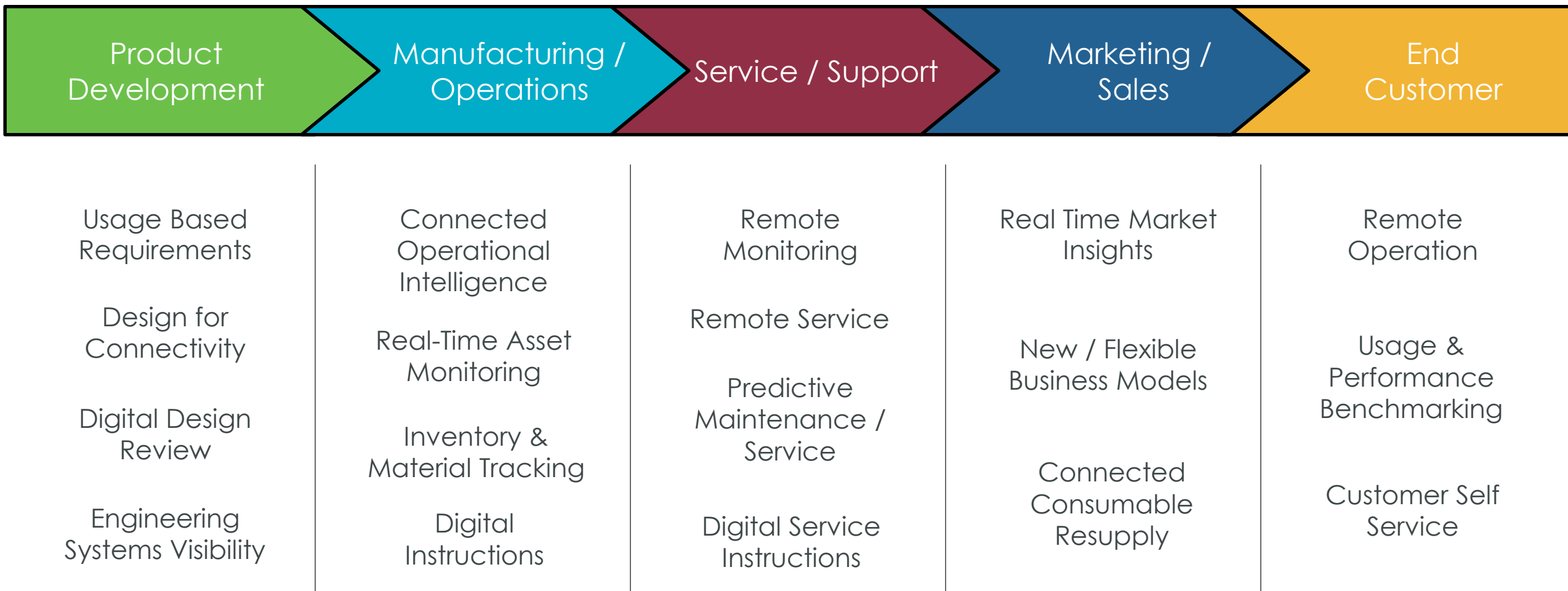


*PTC's State of Industrial Innovation research series is aimed at providing a data-driven, objective view into the current state and future plans of technology adoption to drive industrial innovation.*



[Download the Reports](#)

# IOT OPPORTUNITIES ACROSS THE ENTERPRISE

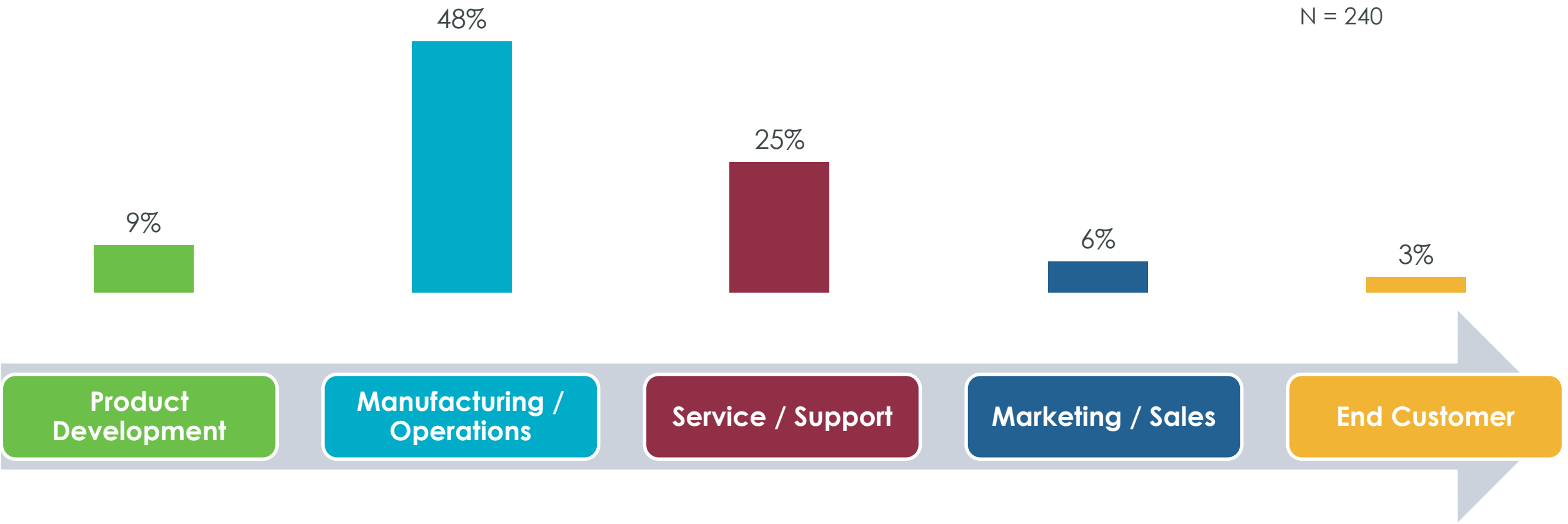


# FUNCTIONAL ADOPTION OF IIOT



% of Respondents adopting IIOT use cases for each functional area

N = 240

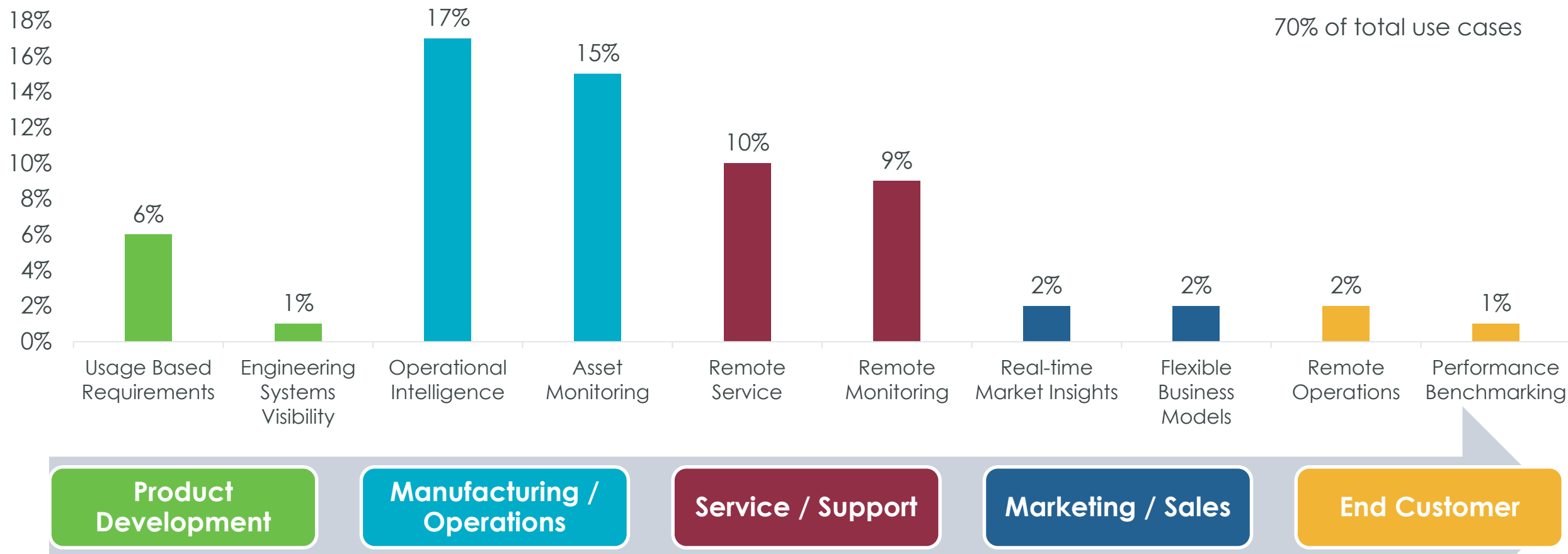


Question: Which use case category [function] are you building IIOT experience(s) around? Select all that apply.

\* 6% of responses not shown(it/ot)

## Top IIOT Use Cases in the Enterprise

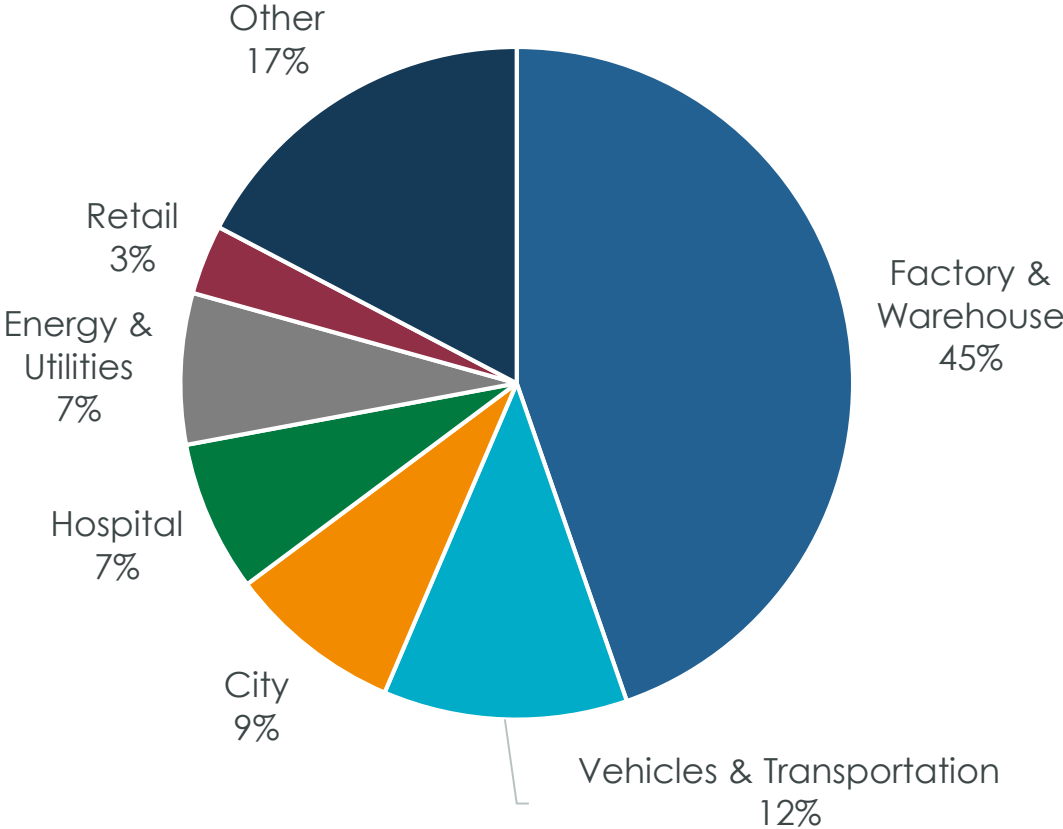
% IIOT use cases developed for each use case type



Question: For each category selected, which specific use cases are you trying to solve for? Select all that apply.

## Operational Environment

N = 179

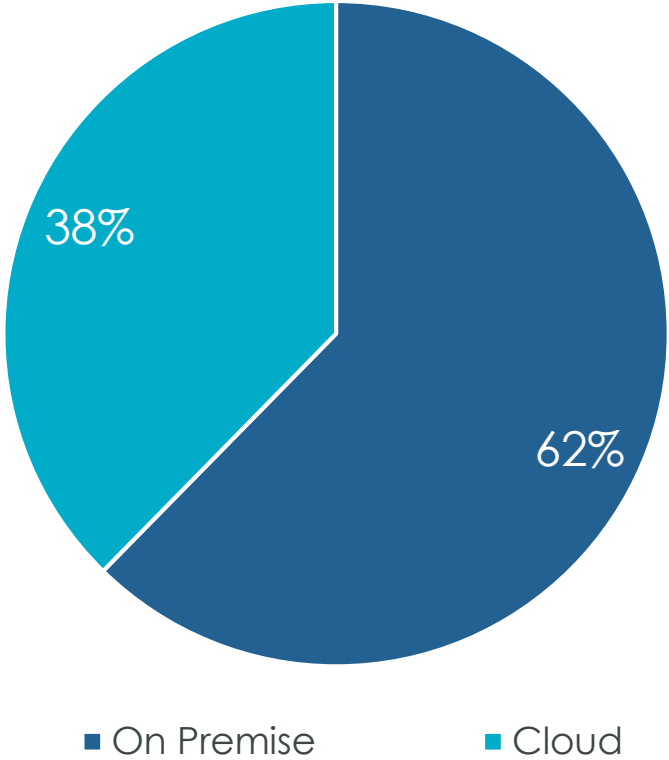


Question: What primary environment is intended to be served by the application built on the ThingWorx platform? Select one.

Other includes: Construction, Home, Agriculture, Education, Other

## Deployment / Hosting Environment

N = 85



Question: In which environment is the customer planning to deploy/host ThingWorx? Select one.



- Leading Industrial Innovation Platform
- AEP + Analytics + Connectivity + AR
- Industrial / Manufacturing Domain Expertise – 28,000 Customers
- 1200 IIoT customers; 40% Growth



- Leading Application Ready Data infrastructure for IIOT
- Proven high scale time series data archive solution for on-premise IIOT
- Access to billions of machine data streams in Process Industry, Energy & Utilities

Process  
Efficiency

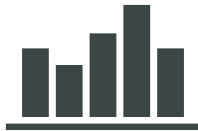
Asset  
Health

Safety &  
Security

Energy  
Use

Quality

Regulation



**SMART**  
MACHINES



Sensors



Actuators



Intelligent Motor Control



Controllers

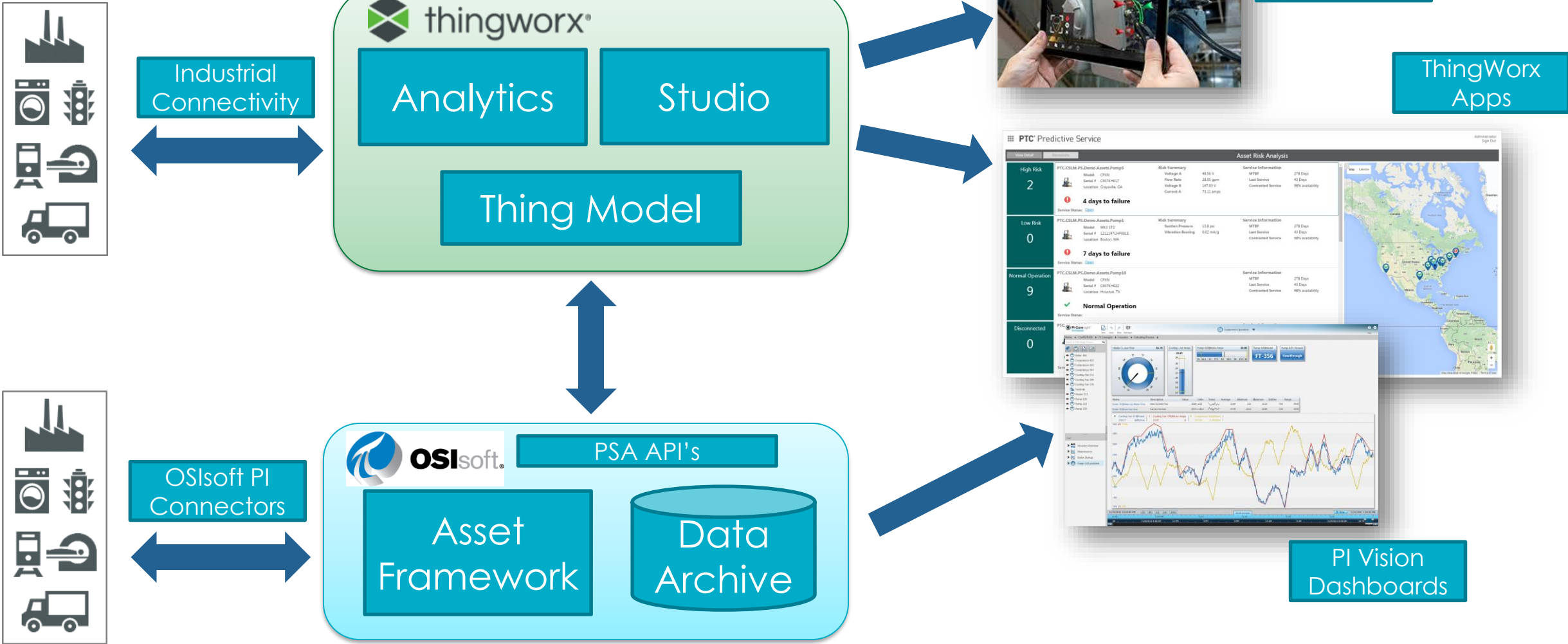


Terminals

**SMART**  
DEVICES



# JOINT SOLUTION





thingworx®

**PLATFORM + APPS + SUPPORTING SERVICES**

ThingWorx Platform

INDUSTRIAL CONNECTIVITY  
FOUNDATION  
ANALYTICS  
UTILITIES

ThingWorx Studio

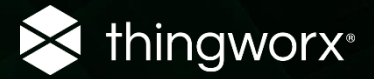
ThingWorx Apps

THINGWORX NAVIGATE  
THINGWORX CONTROLS ADVISOR  
THINGWORX PRODUCTION ADVISOR  
THINGWORX ASSET ADVISOR

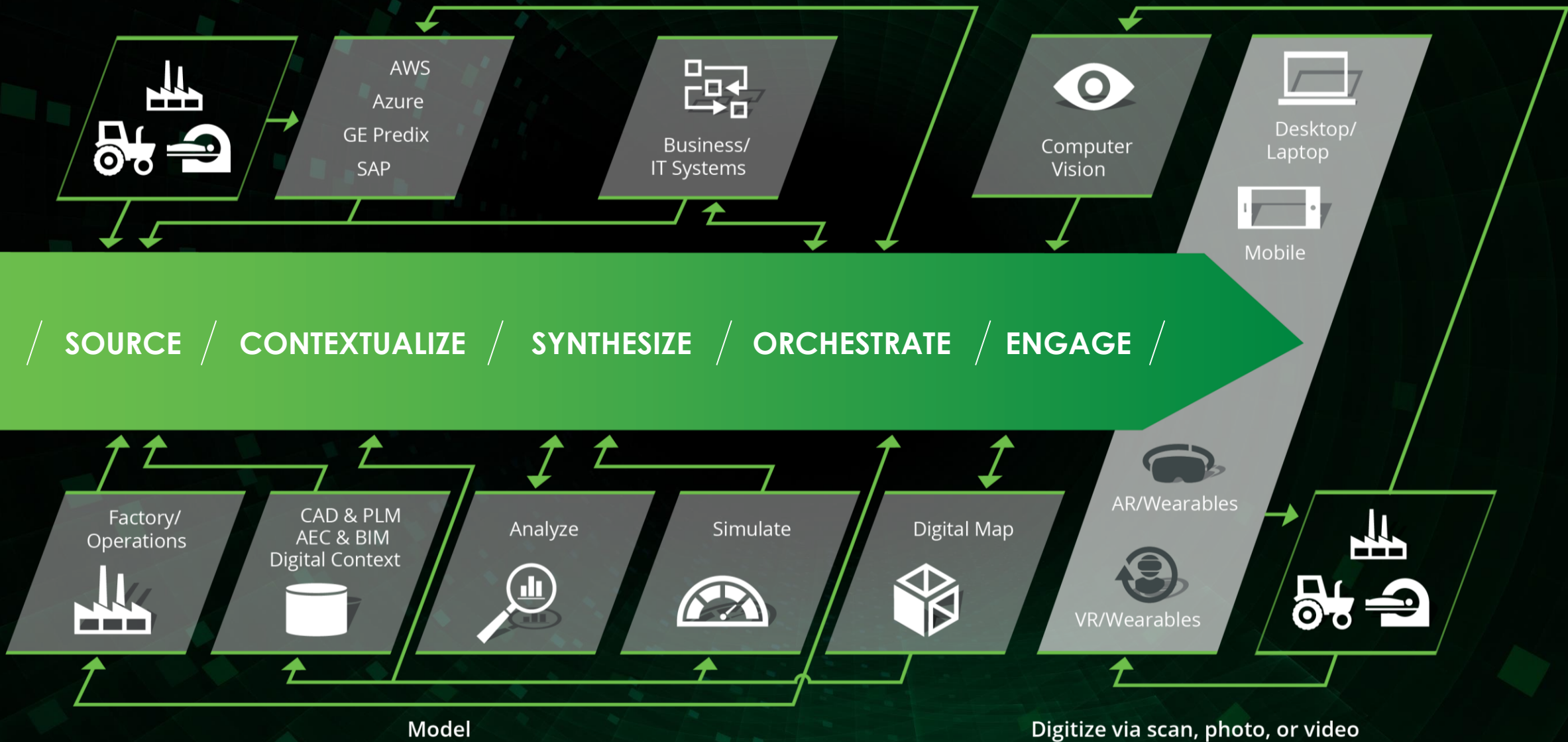
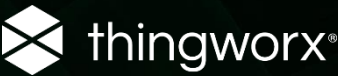
ThingWorx Developer Zone

ThingWorx Marketplace

# THINGWORX IS FOCUSED ON “LONG TAIL” APPLICATIONS

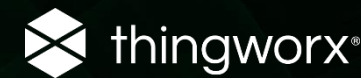


# Industrial Innovation Platform

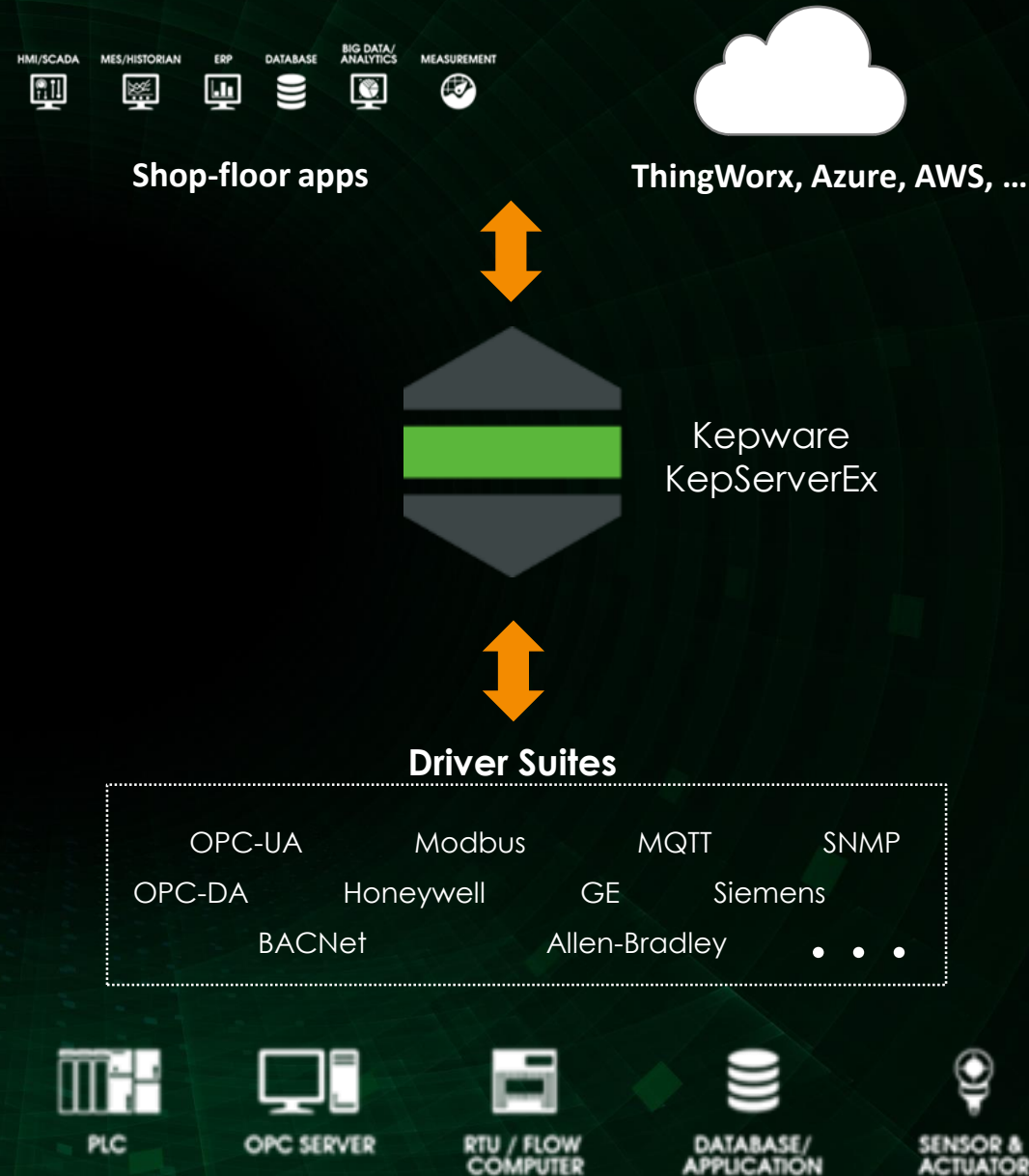




# Source – Industrial Connectivity



- Consolidates data and information from many sources into one industrial connectivity platform
- Supporting over **150** industrial standard and proprietary protocols
- Translates tag data into usable streams
- Consolidates access to hundreds of industrial controllers and infrastructure
- Securely brokers to shop floor apps, on-premise ThingWorx, and other cloud messaging systems



# Contextualize - ThingModel

## Things



## Thing Template



### Properties

- Head temp
- Planarizer status
- Ambient Temp
- BOM

### Services

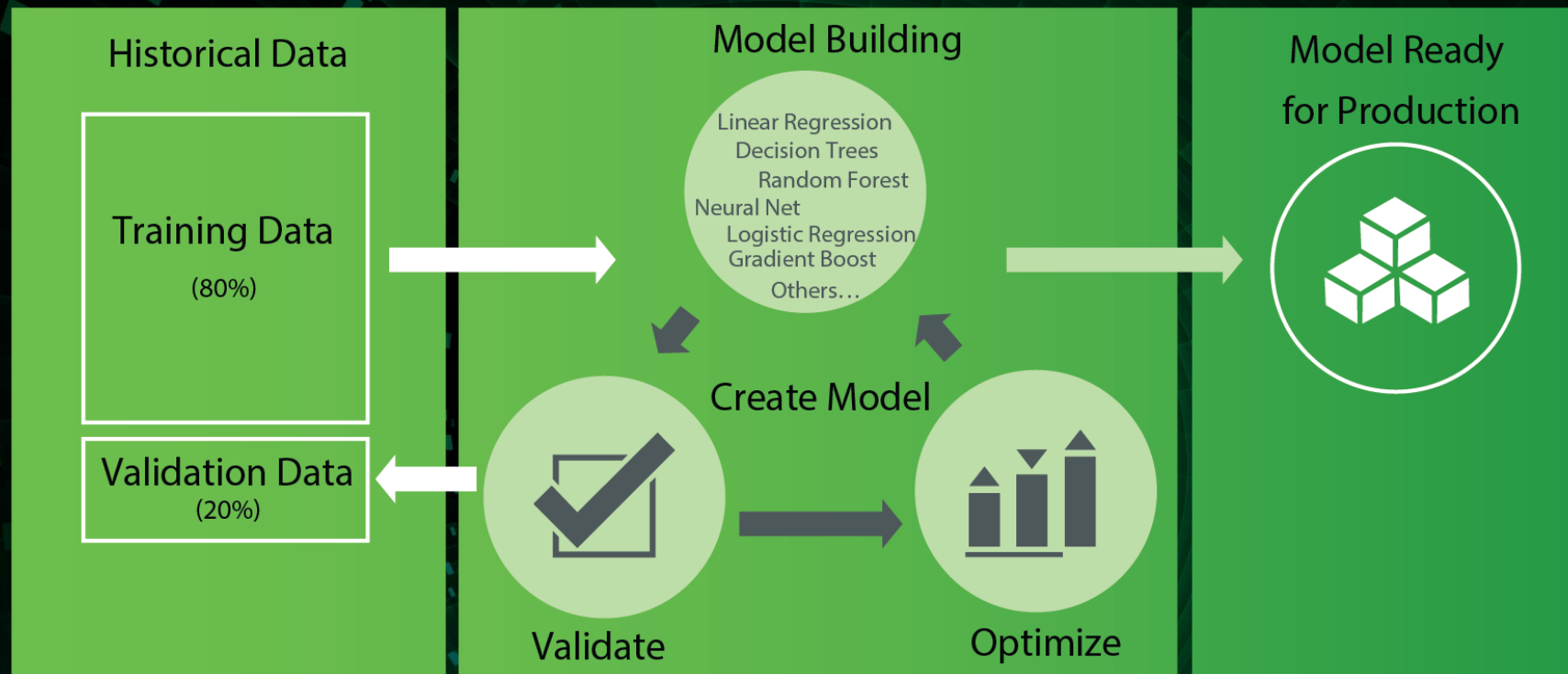
- Get Material Lvl
- Update firmware
- Report Failure

### Events

- Materials low
- High head temp
- Malfunction Predicted



Enterprise Systems

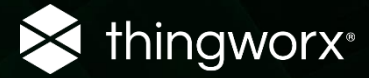


- Automated Machine Learning Modeling
- Diagnostic, Predictive and Prescriptive Analytics
- Real-time anomaly detection on data streams

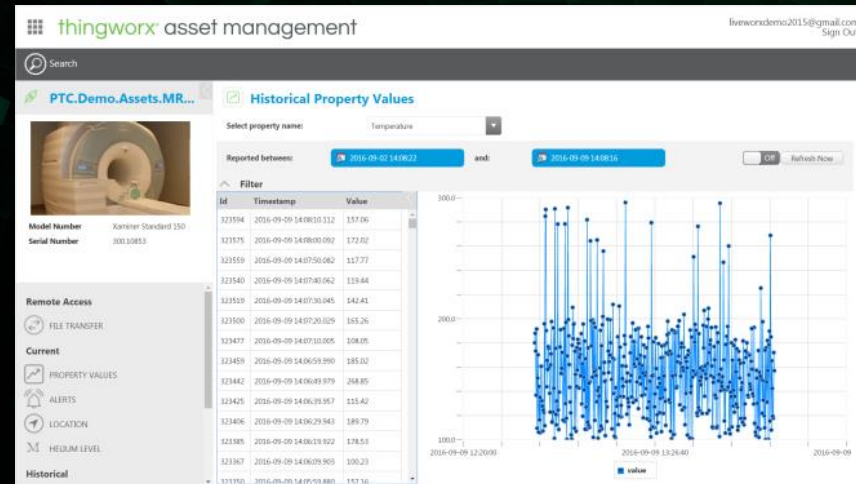
- Learns from historical performance and uses AI technology to automatically build, validate, and maintain models
- Automatically identifies and reveals which data signals are most important in predicting outcomes



# Orchestrate – Business Systems & Workflow

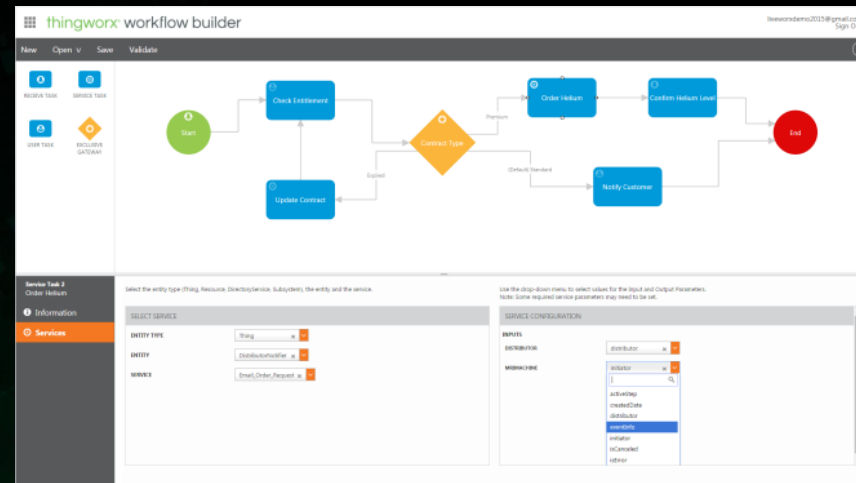


- Pre-defined IoT application components that developers can readily customize and extend
- Easily manage all connected devices across the enterprise
- Secure mass distribution of embedded software to connected devices
- Create IoT-enabled workflows to automate business processes



The screenshot shows the 'Alert Management' interface with a table of alerts. The table columns include 'Name', 'Source Property', 'Source', 'Timestamp', 'Alert Type', 'Duration (ms)', 'Message', and 'Description'. The alerts are filtered by 'Alert Type' as 'Low' and 'High Temperature'. A sidebar on the left shows 'Alert Details' for a selected alert, including 'Event Name', 'Message', 'Timestamp', 'Location', and 'Tags'.

Name	Source Property	Source	Timestamp	Alert Type	Duration (ms)	Message	Description
Low	HeliumLevel	PTC.Demo.Assets.MR_1	2016-09-07 14:33:40.618	Below	172500337	25 <= 25	Low Helium level detected during operation
Low	HeliumLevel	PTC.Demo.Assets.MR_6	2016-09-07 14:33:40.645	Below	172500350	25 <= 25	Low Helium level detected during operation
Low	HeliumLevel	PTC.Demo.Assets.MR_3	2016-09-07 14:33:40.639	Below	172500356	25 <= 25	Low Helium level detected during operation
Low	HeliumLevel	PTC.Demo.Assets.MR_4	2016-09-07 14:33:40.634	Below	172500361	25 <= 25	Low Helium level detected during operation
Low	HeliumLevel	PTC.Demo.Assets.MR_2	2016-09-07 14:33:40.382	Below	172622313	25 <= 25	Low Helium level detected during operation
Low	HeliumLevel	PTC.Demo.Assets.MR_8	2016-09-07 14:33:40.371	Below	172622324	22 <= 25	Low Helium level detected during operation
High Temperature	Temperature	PTC.Demo.Assets.MR_1	2016-09-07 13:44:43.173	Above	175439522	100 <= 119.42	High temperature detected during operation
High Temperature	Temperature	PTC.Demo.Assets.MR_2	2016-09-07 13:44:43.154	Above	175439541	100 <= 120.66	High temperature detected during operation
High Temperature	Temperature	PTC.Demo.Assets.MR_7	2016-09-07 13:44:43.137	Above	175439558	100 <= 182.1	High temperature detected during operation
High Temperature	Temperature	PTC.Demo.Assets.MR_8	2016-09-07 13:44:43.109	Above	175439586	100 <= 141.27	High temperature detected during operation
High Temperature	Temperature	PTC.Demo.Assets.MR_5	2016-09-07 13:44:43.062	Above	175439613	100 <= 109.82	High temperature detected during operation
High Temperature	Temperature	PTC.Demo.Assets.MR_6	2016-09-07 13:44:43.044	Above	175439651	100 <= 123.39	High temperature detected during operation

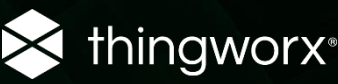


The screenshot shows the 'Workflow Management' interface with a table of workflows. The table columns include 'Status', 'Asset', 'Alert', 'Property', 'Workflow Name', 'Date Generated', and 'Activity'. The workflows are filtered by 'Status' as 'In Progress' and 'Complete'. A sidebar on the left shows 'Workflow Details' for a selected workflow, including 'Workflow Name', 'Asset', 'Alert', 'Property', 'Date Generated', and 'Activity'.

Status	Asset	Alert	Property	Workflow Name	Date Generated	Activity
In Progress	PTC.Demo.Assets.MR_3	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:28.002	Activity 2
In Progress	PTC.Demo.Assets.MR_2	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:28.008	Activity 2
In Progress	PTC.Demo.Assets.MR_1	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:28.049	Activity 2
In Progress	PTC.Demo.Assets.MR_4	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:38.052	Activity 2
In Progress	PTC.Demo.Assets.MR_5	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:38.084	Activity 2
In Progress	PTC.Demo.Assets.MR_6	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:46.097	Activity 2
In Progress	PTC.Demo.Assets.MR_8	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:48.108	Activity 2
In Progress	PTC.Demo.Assets.MR_7	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:31:48.123	Activity 2
Complete	PTC.Demo.Assets.MR_3	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:26:57.338	End
Complete	PTC.Demo.Assets.MR_1	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:27:27.388	End
Complete	PTC.Demo.Assets.MR_2	Alert - Low	HeliumLevel	PTC.Selenium.HeliumDefinition	2016-09-09 15:27:27.398	End



# Engage – Mashup Builder



thingworx

Search

New Entity

Import/Export

Monitoring

Help

Learning Connector

JoeB

RiaansDemo

Mashup

Design

Info

View Mashup

Save

Cancel Edit

Widgets

Mashups

Workspace

Category

All

Filter Widgets

Auto Refresh

Bar Chart

Beautifier

Blog

Bubble Chart

Button

ButtonTooltip

Checkbox

ClickableImage

Collection View

Contained Mashup

Dashboard

Data Export

dhxgrid-5

Filter Properties

Name	Value
-T- Id	dhxgrid-5
-T- Type	Grid
-T- DisplayName	dhxgrid-5
-T- Description	
RowFormat	State Formatting
AlignHeader	<input type="checkbox"/>
MultiSelect	<input type="checkbox"/>
IsEditable	<input type="checkbox"/>
AutoSelectFirstRow	<input type="checkbox"/>
CellTextWrapping	<input type="checkbox"/>

Item

Item

Selected

Item

Item

Item

Item

Preview

Available Space

Default Language

United States

Mexico

Guatemala

Nicaragua

Venezuela

Colombia

Ecuador

Paraguay

ActiveWarmBottleBeingUsed\_0

Air\_temp

AssetBlog

Asset

Connections

To-Do

ThingTemplates\_PTC.Demo.Ass...

QueryImplementingThingsWith...

All Data

Data

dhxgrid-5

Data

Session

User

ThingTemplates\_PTC.Demo.Assets.3...

QueryImplementingThingsWithData

Parameters

Returned Data

All Data

ActiveWarmBottleBeingUsed\_0

air\_temp

AssetBlog

AssetImage

Availability

avatar

BatchDataTable

Bearing\_K

Blog

BottleExpirationReached\_12

BuildBTETime

123 BuildCurrentElapsedTime

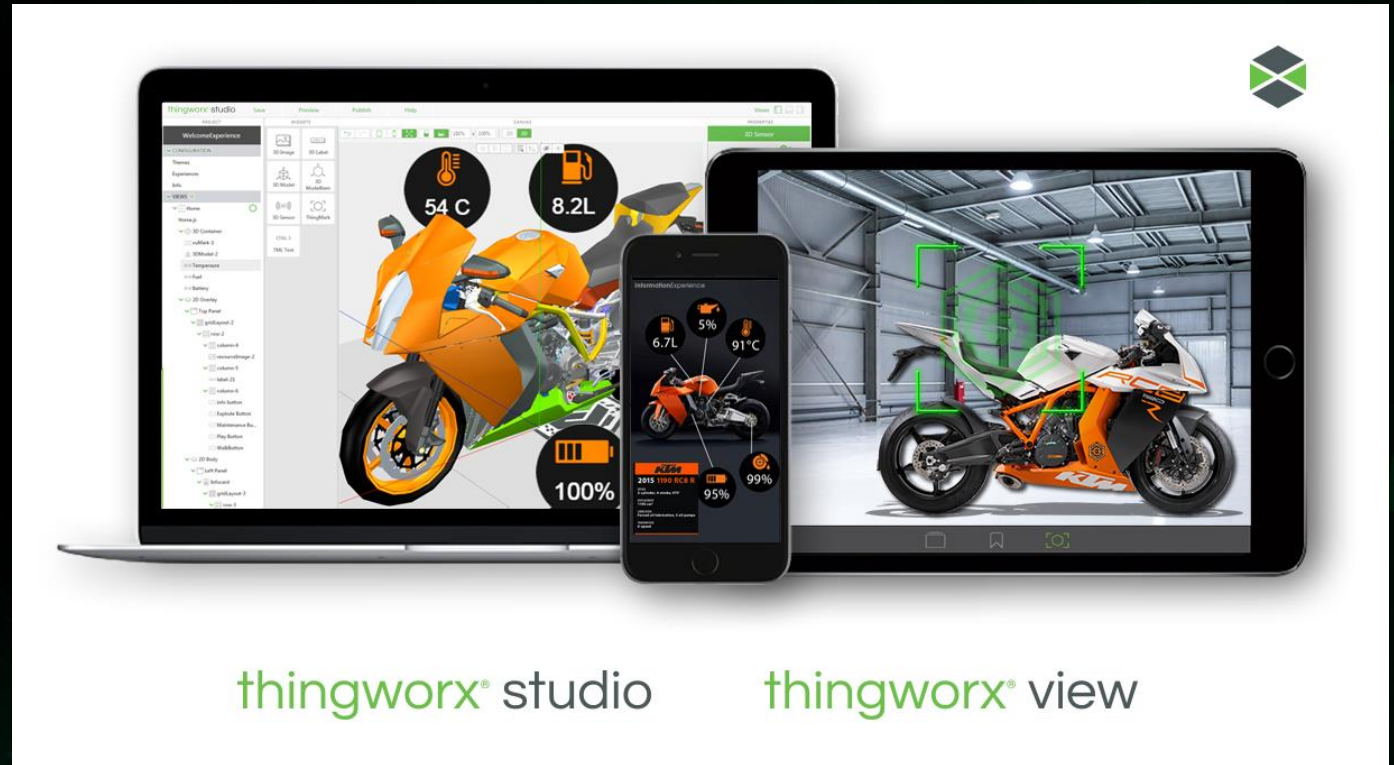
123 BuildCurrentLayer

BuildEndTime

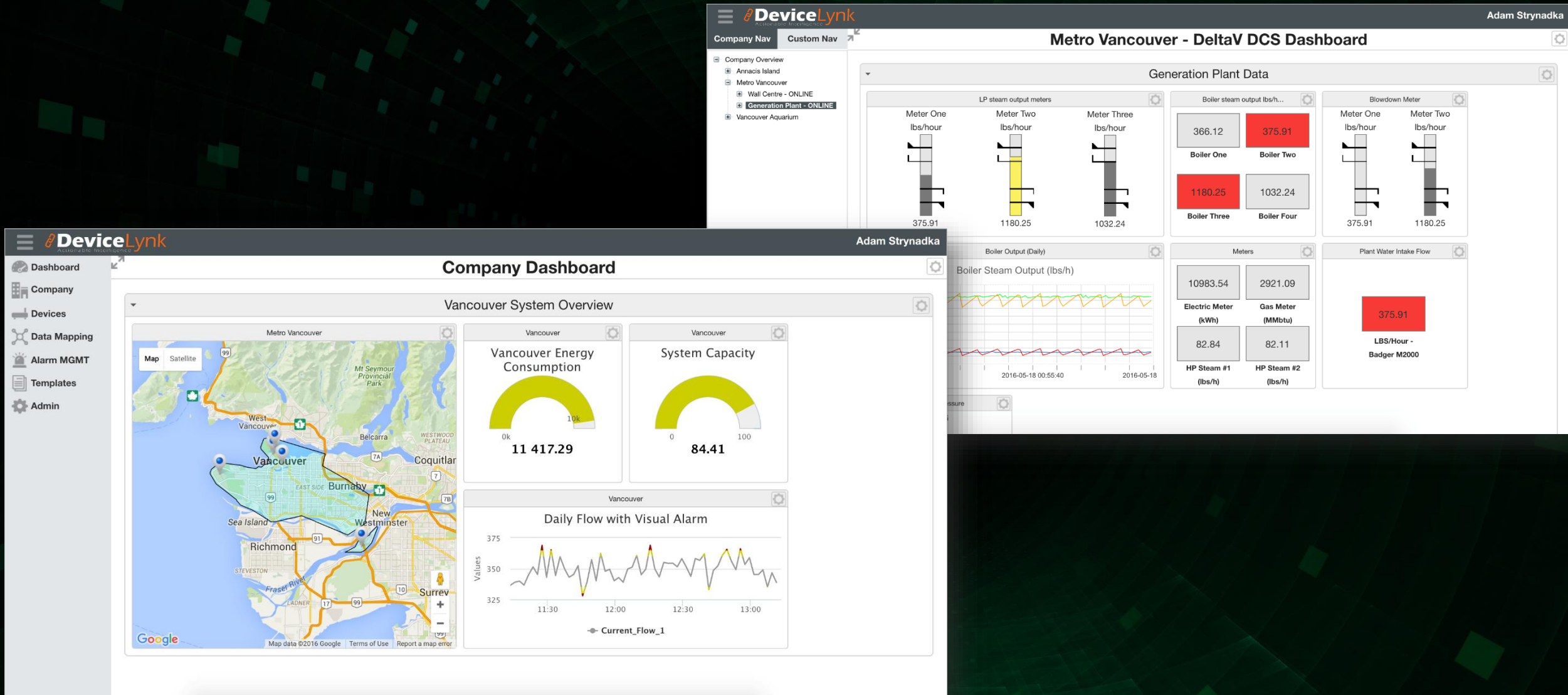
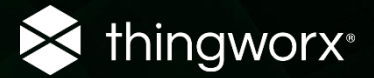
Name	Value
------	-------

- Author AR  
*without writing any code*
- Easily re-use  
existing 3D Content
- Industrial IoT-Ready
- Unified AR Viewer App
- Present Compelling  
Sequences in AR

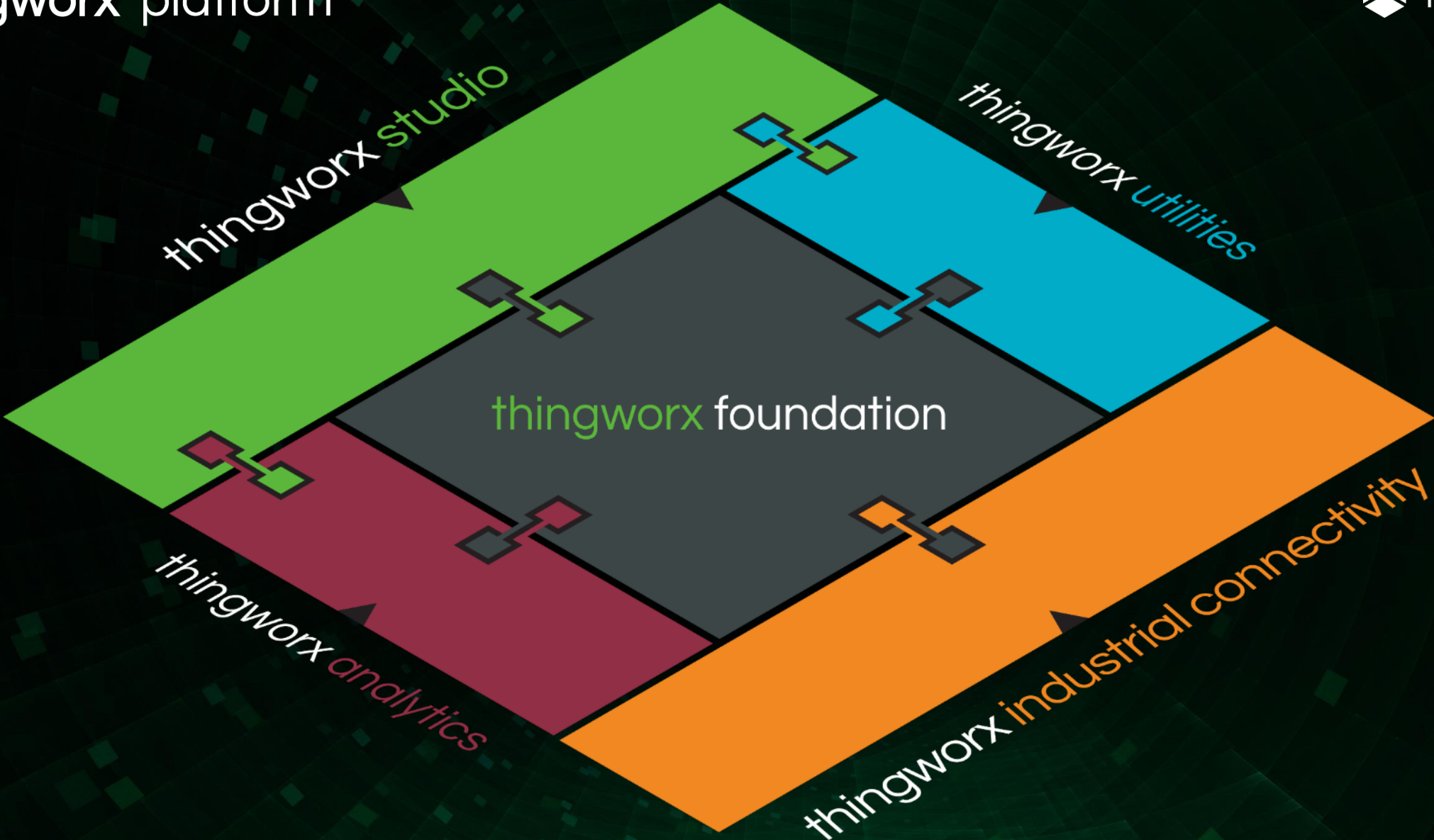
## Augmented Reality for the Industrial Enterprise



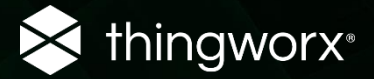
# A Solution built with ThingWorx



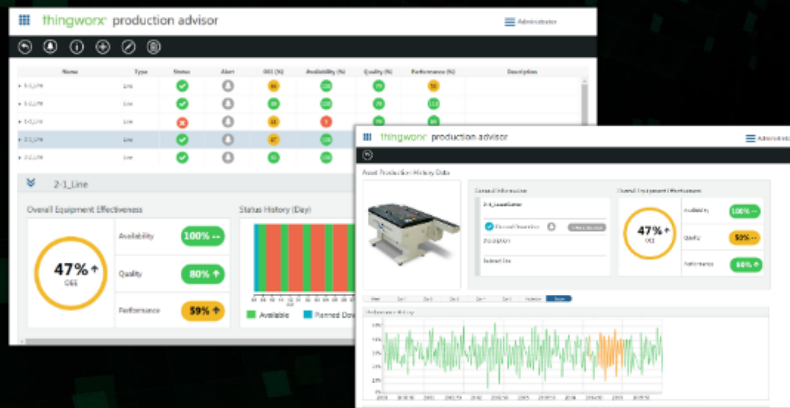




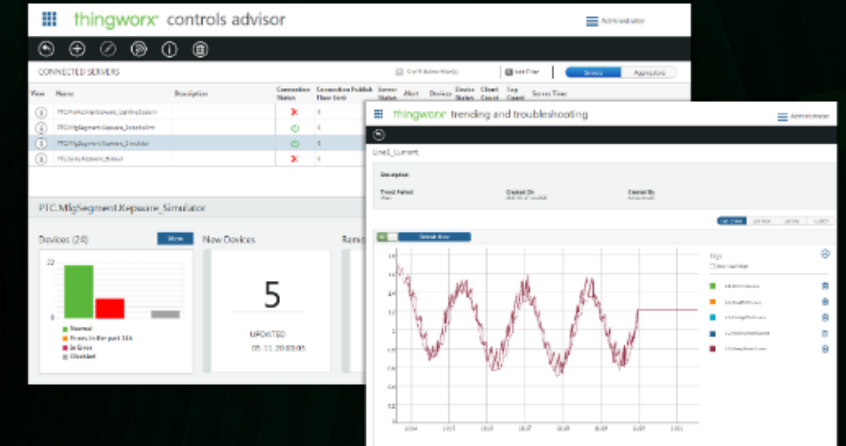
# thingworx® platform Accelerator Apps



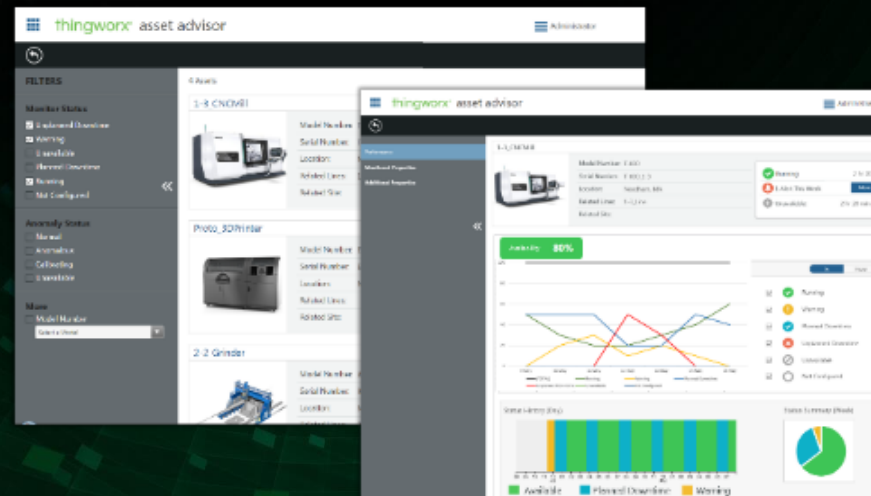
## thingworx® production advisor



## thingworx® controls advisor



## thingworx® asset advisor





**EUROPEAN  
4.0 TRANSFORMATION  
CENTER**



## INDUSTRIE 4.0 AT RWTH AACHEN ELAB

Powered by



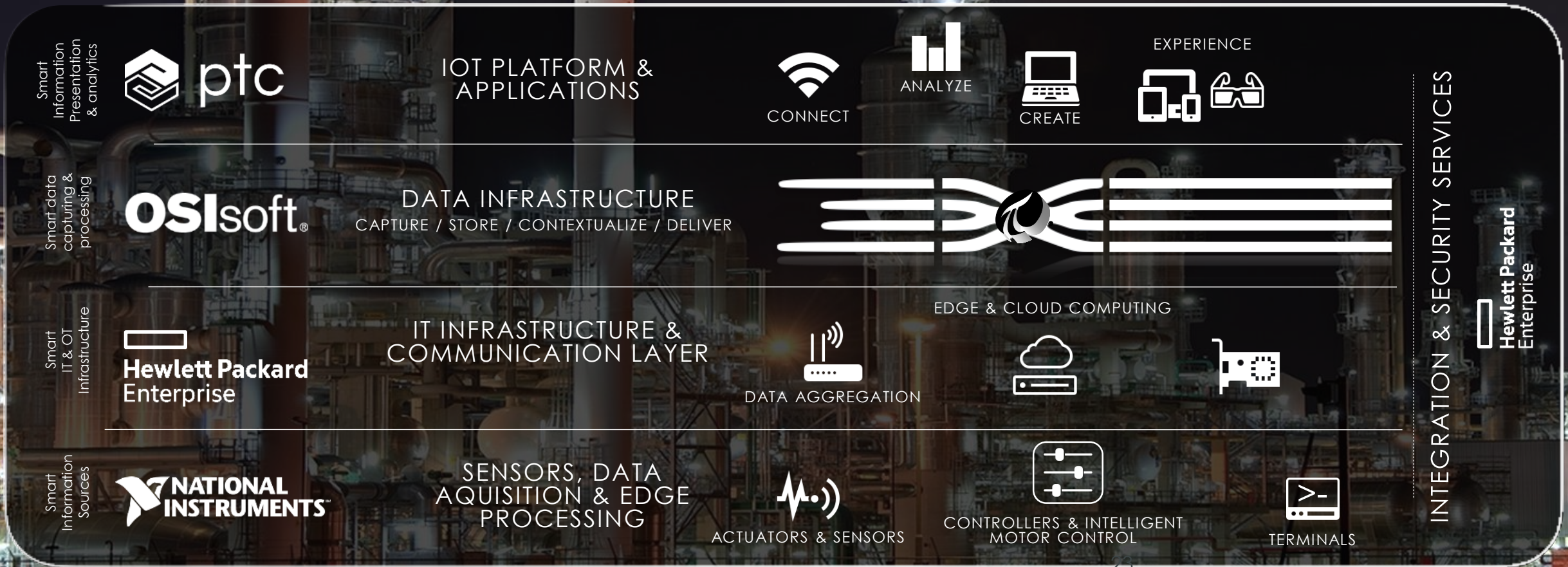
**Hewlett Packard  
Enterprise**





# A COLLABORATIVE APPROACH TO DIGITALIZATION

„... if you want to go fast, go alone; if you want to go far, go together“





## Manish Yashvant

*Dir., IoT Strategic Alliances*

PTC

[myashvant@ptc.com](mailto:myashvant@ptc.com)

510-304-5363



# Questions

Please wait for the **microphone** before asking your questions

State your **name & company**



# Please remember to...

Complete the Online Survey for this session

A smartphone displaying the OSIsoft Users Conference 2017 app interface. The screen shows a menu with options like 'Home', 'About', 'Contact', 'Sponsors', and 'Partners'. A large red diagonal banner across the screen reads 'UPDATED VERSION COMING SOON'. To the right of the phone, text says 'Download the Conf OSIsoft Users App for 2017'. Below this, there are buttons for 'Download on the App Store', 'GET IT ON Google Play', and 'HTML'. At the bottom, a blue banner says 'search OSISOFT in the app store'.

Merci

谢谢

Спасибо

Danke

Gracias

Thank You

감사합니다

ありがとう

Grazie

Obrigado