

WEBINAR HOST & PRESENTER



Ed Maguire

Insights Partner, New York
Momenta Partners

Ed brings more than 17 years of Wall Street experience in equity research and investment banking to Momenta, with deep domain expertise in enterprise software. He has proven success identifying strategic opportunities and articulating actionable insights based on rigorous analysis of technology, operations, competition and markets. Most recently he was senior analyst and managing director at CLSA Americas covering the software industry, technology and innovation.

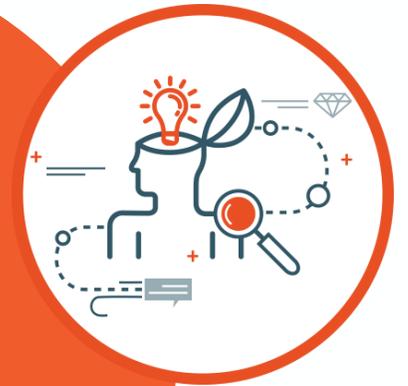
Three Integrated Practices

Hyper-focused
on Industrial IoT

ADVISORY



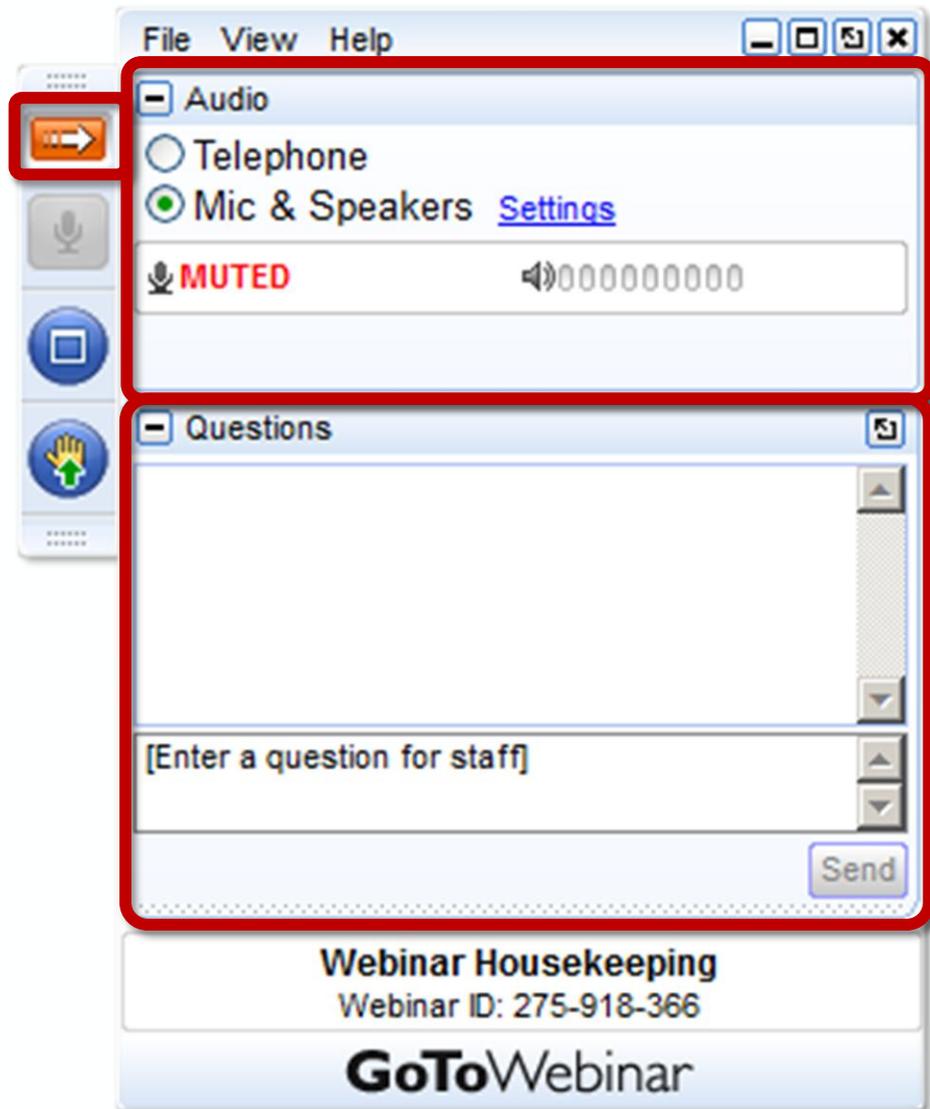
EXECUTIVE
SEARCH



MOMENTA
PARTNERS



VENTURES



YOUR PARTICIPATION

Open and close your control panel using the orange tab

Join audio:

- Choose **Mic & Speakers** to use VoIP
- Choose **Telephone** and dial using the information provided

Submit questions and comments via the Questions pane

NOTE: Today's presentation is being recorded. A link to the recording will be provided within 24-48 hours.

WEBINAR PANELISTS

Paul Anderson

Edge Computing Industry Expert



- Experienced Entrepreneur/Intreprenuer, Executive, and Change Agent with over 25+ years of experience building connected products and services in the industrial, medical, consumer, and retail segments.
- Senior leadership roles at Wind River, Intel, Verifone

Vatsal Shah

CEO & Founder | Litmus Automation



- Worked Rockwell Automation as a Design Engineer on one of the largest Oil & Gas deployments, connecting field levels devices to applications for advanced monitoring.
- Bachelor of Tech in Instrumentation and Control Engineering and a Masters in Global Entrepreneurship

Jon Sobel

CEO & Founder | Sight Machine



- Served on the management teams of pioneers of industry, including Tesla Motors, SourceForge, and in its early years, Yahoo!
- Holds an BA from Princeton, a JD from the University of Michigan, and an MBA from Wharton

Jim Fletcher

Strategy Partner | Momenta Partners



- Positions in areas of networking, IT systems management, and pervasive computing.
- Most recently Distinguished Engineer and CTO for IBM's Watson IoT Platform and is an IBM master inventor holding over 60 patents.

AGENDA

10 min.

>> **Introduction and Overview**

Ed Maguire – Insights Partner, Momenta Partners

10 min.

>> **Views from an Edge Computing Expert**

Paul Anderson – Edge Computing Industry expert

10 min.

>> **Using One Edge Technology Solution**

Jon Sobel - CEO, Sight Machine

10 min.

>> **Using Another Edge Technology Solution**

Vatsal Shah - CEO, Litmus Automation

10 min.

>> **Summary, Observations & Predictions**

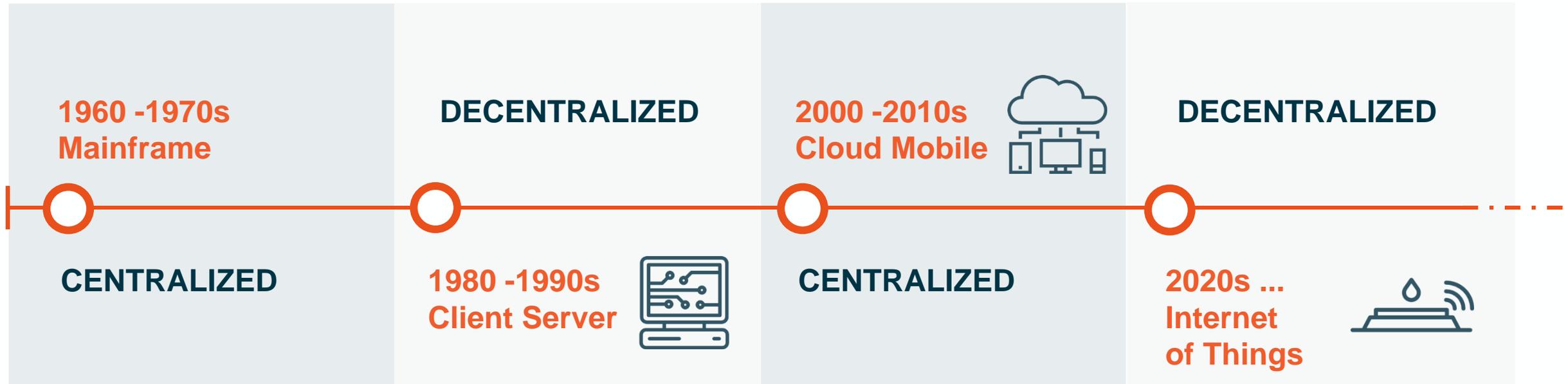
Jim Fletcher – Strategy Partner, Momenta Partners

10 min.

>> **Q&A**

Evolving Computing Paradigms

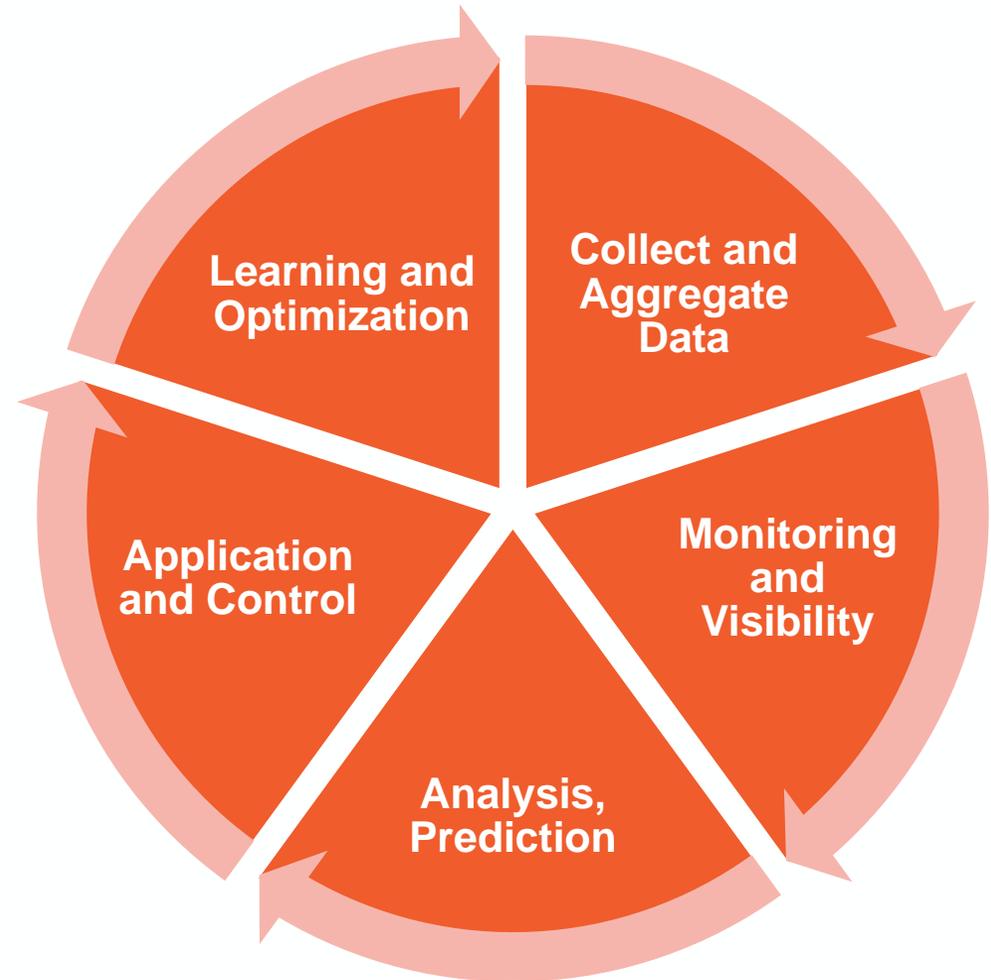
From Centralized to Decentralized - Usage scales by orders of magnitude



First Principles

It's all about getting value from data

- Successful implementation of IoT analytics can drive fundamental business transformation
- Creating business value from analysis of collected data from “things”
- Analytics create value by managing risk, creating predictions and optimizing operations



The Coming Data Deluge

Data gets bigger and bigger

PER DAY

Connected Car:	4 TB / per car
Oil Rig:	10 TB / per well
Solar PV systems:	5 PB
Jet Engine:	2.5 TB
Wind Turbine:	5 TB
Ship:	1.5 TB



Driving Intelligence to The Edge

Data overwhelms the centralized model

- Current cloud model not designed to address all type of IoT scenarios
- Convergence of low-latency, powerful technologies like Robotics, Autonomous Vehicles, AR/VR, Cognitive/AI, Blockchain/DLT
- Time-sensitive, real time data processing needs to happen where data is being collected
- Localized processing needs to take place in diverse environments
- Customers don't want siloed systems or services
- Challenges to IT/OT convergence: networking vs. specific applications of technology

Promising Growth Forecast for Intelligent Edge

High growth opportunities will come from the edge

40% of IoT Data will be processed at the edge (IDC) by **2019**

Move from isolated islands to securely and intelligently integrated environments

Growth in IoT compute will primarily come from edge gateways and converged IT/OT systems

- IoT infrastructure spending **10.5%** Cagr to **\$16.9bn** in 2021 (IDC)
- Edge infrastructure **22.0%** Cagr to **\$3.4bn** in 2021
- (IDC)IoT Big Data Analytics Software Tools **34%** Cagr through 2021



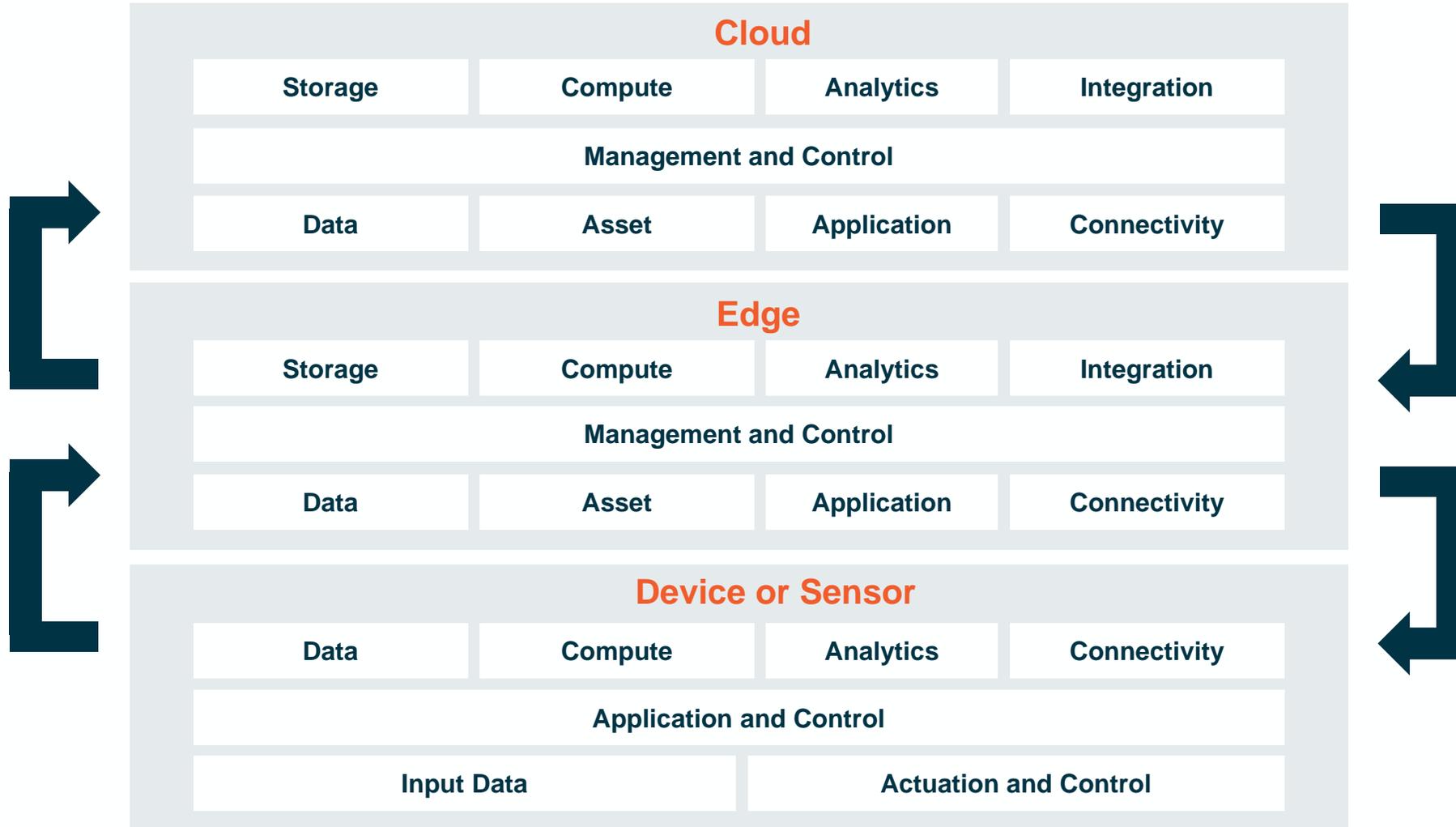
Expert Perspective

Paul Anderson

Edge Computing Industry Expert

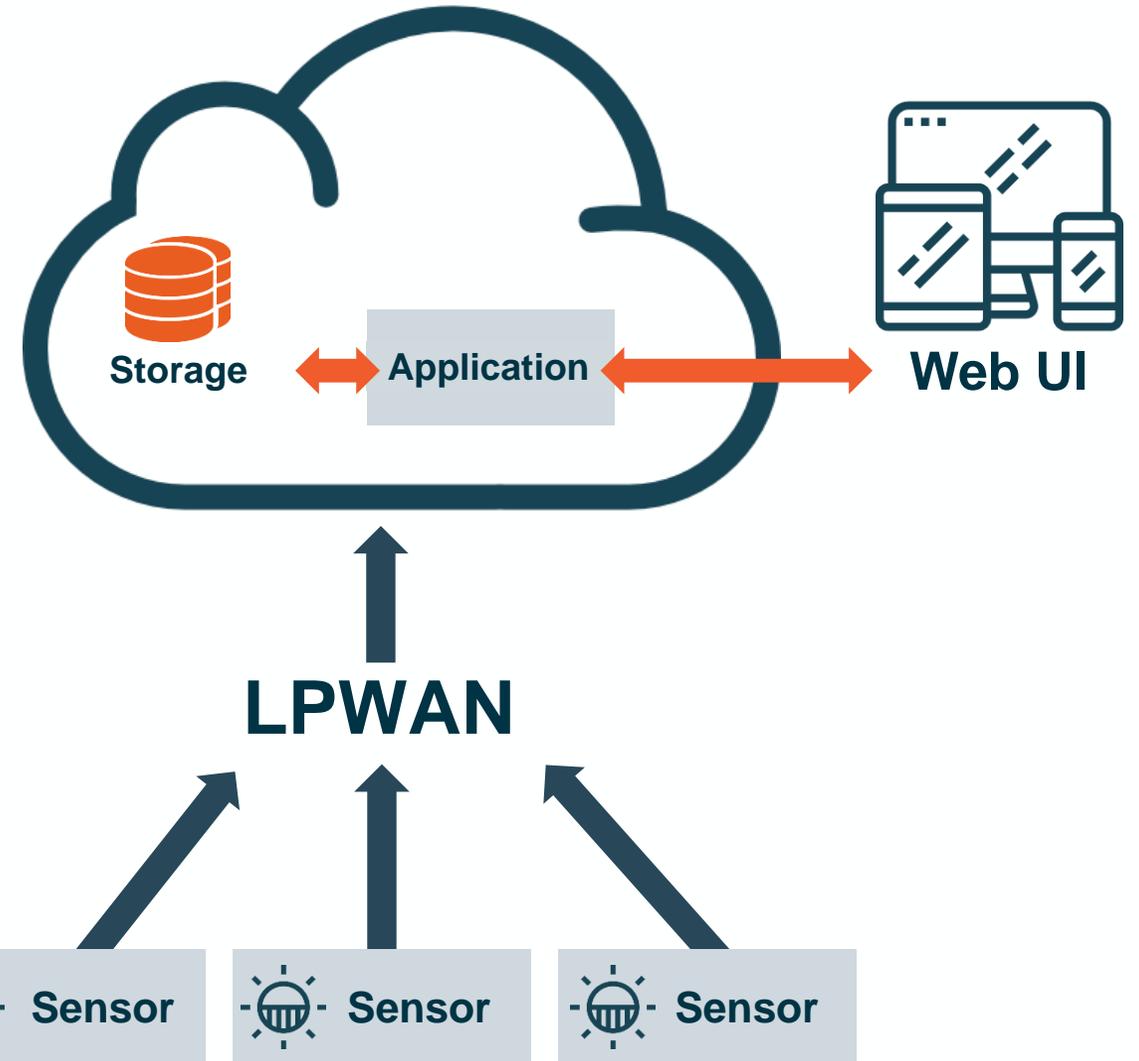
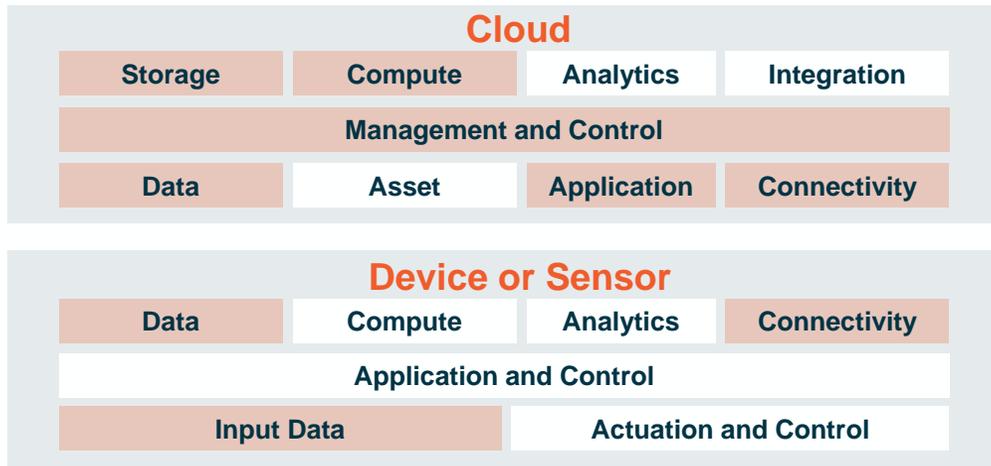
Simple Taxonomy of an IoT Solution

Different use cases require different solutions – One size does not fit all



Simple: Low Power Secondary Sensing

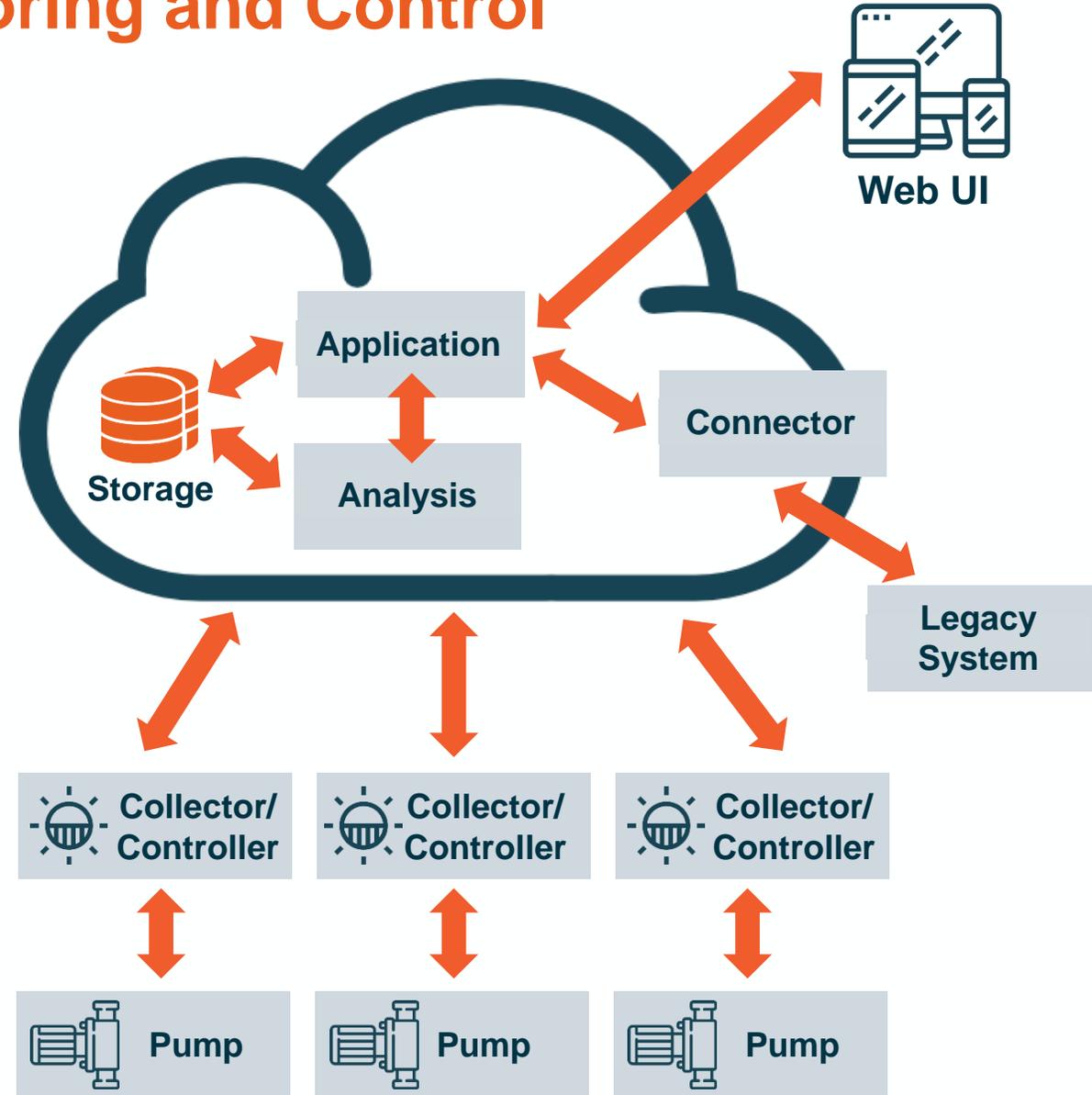
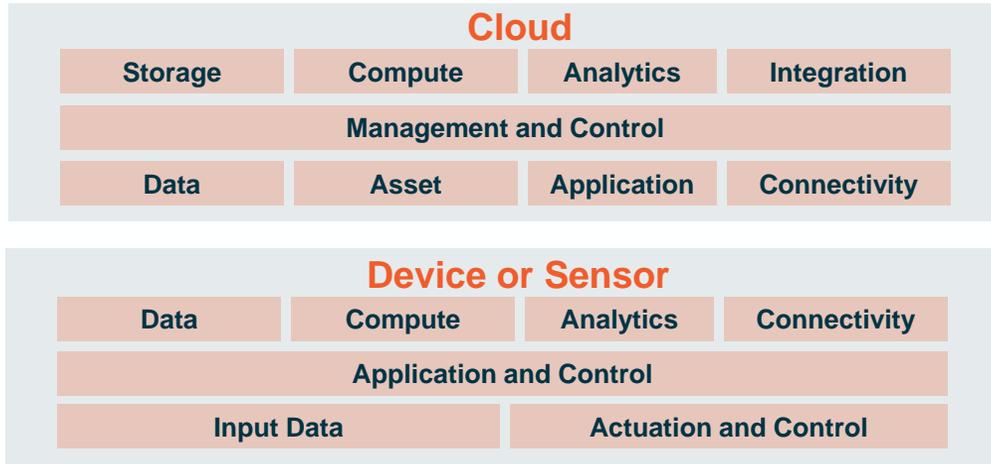
Environmental Monitoring



- Low Power
- Unidirectional Data Flow
- Low Data Rate
- Not Mission Critical

Intermediate: Remote Site Monitoring and Control

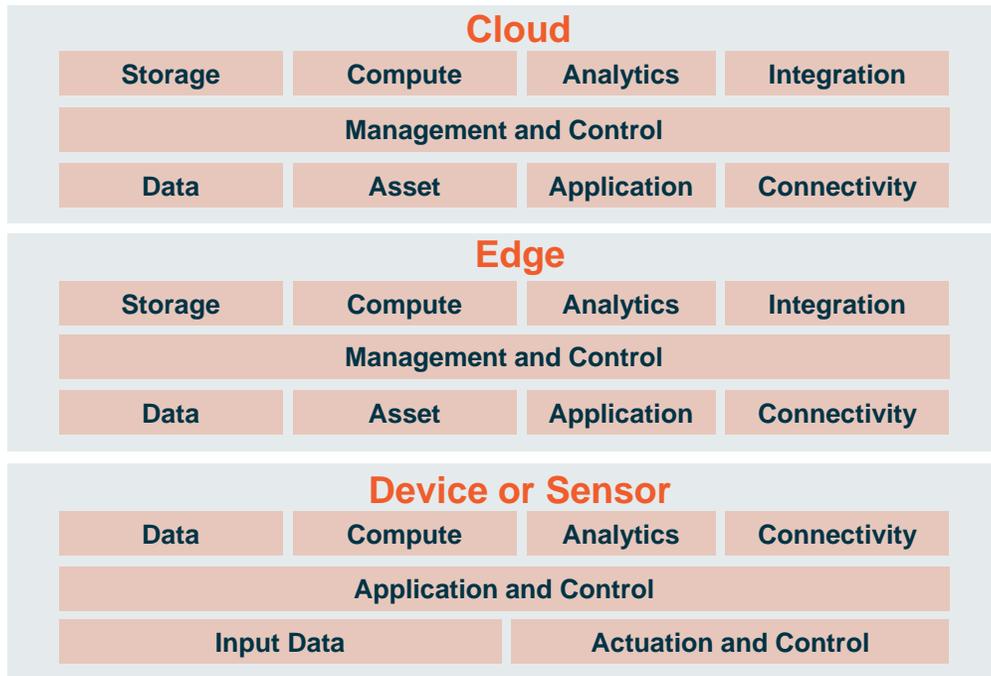
Municipal Well Pump or Lift Station



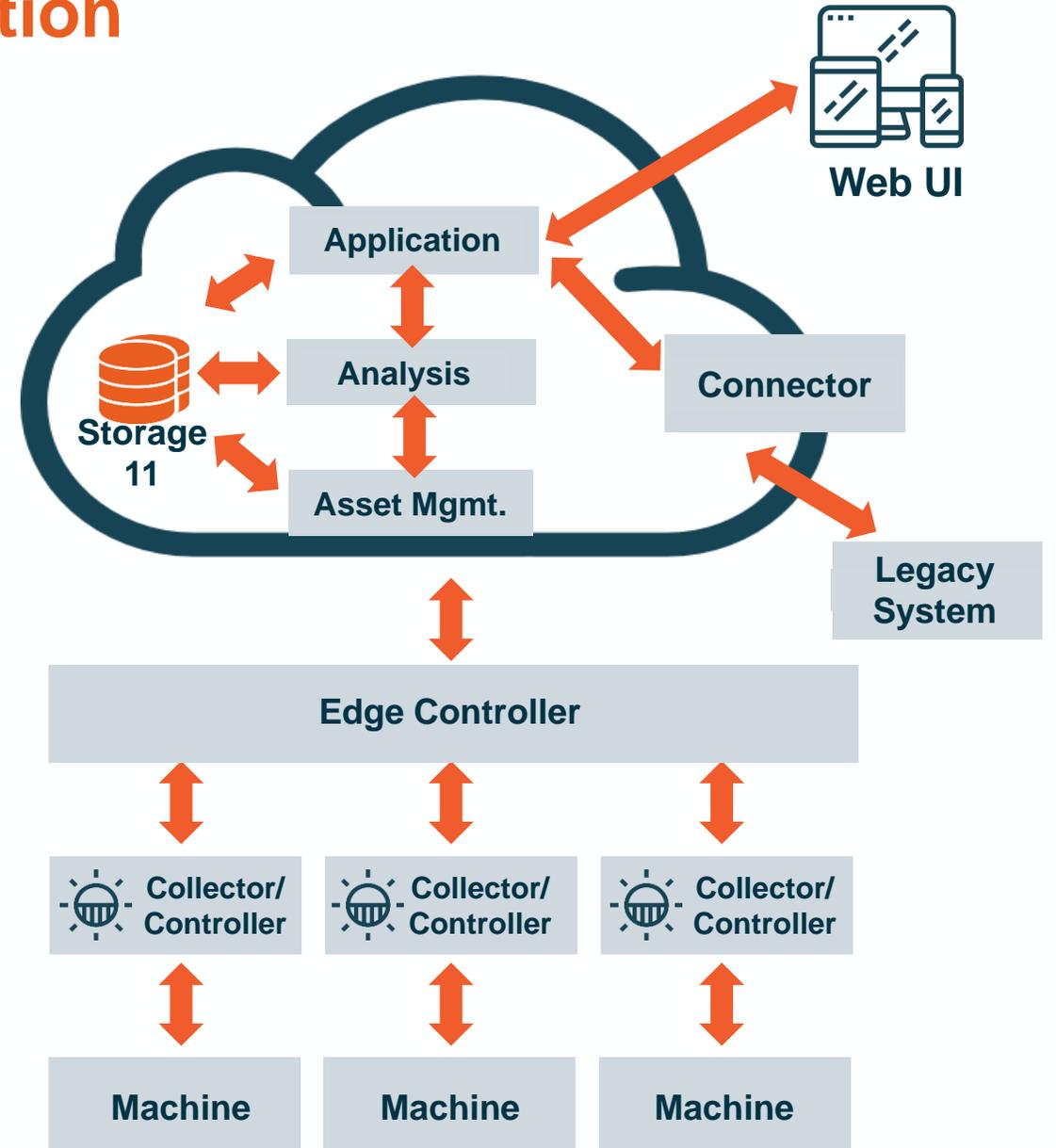
- Industrial Environment
- Medium Data Rate
- Limited Offline Operation
- Some Data Reduction and Local Analytics Possible
- “Embedded Edge”

Advanced: Factory Floor Automation

Food and Beverage Packaging



- Mixed IT/OT Environment
- High Data Rate
- Full Offline Operation
- Local Analytics and Orchestration
- Data Flow Flexibility
- Advanced Asset Management



IoT Edge Computing

Challenges:

- Legacy System Bridging
- Environmental and Physical Requirements
- Data Coherency & Configuration Mgmt.
- Cost and Complexity

Opportunities:

- Enables New Services
- Improved Reliability & Autonomy
- Enable Dynamic Solutions
- Efficient Network Utilization
- Near Real Time Control
- Data Privacy & Management

Solution Provider / Use Case

Jon Sobel
CEO, Sight Machine

Sight Machine

From Data Chaos
to Business Impact



Demystifying Edge Computing



Manufacturers are "digitizing" existing systems without defining the right Architecture



Digital Facade Doesn't Address Underlying Issues

- Edge only = Islands of data
- Cloud only = Lack of speed, flexibility
- Don't just create a Smart Factory, create a Smart Enterprise

The underlying challenge: Turning data into Operational Intelligence

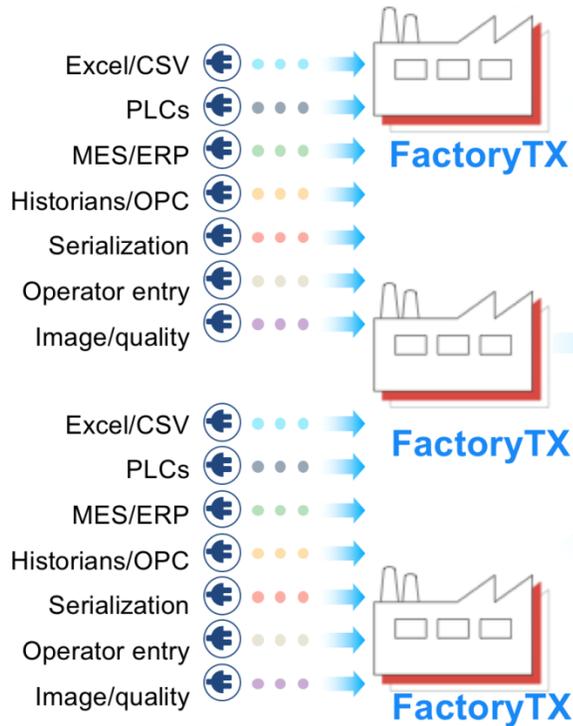
To Deliver on the Promise of IoT, Enterprises must Seamlessly Use Cloud, Edge, and Fog

Edge

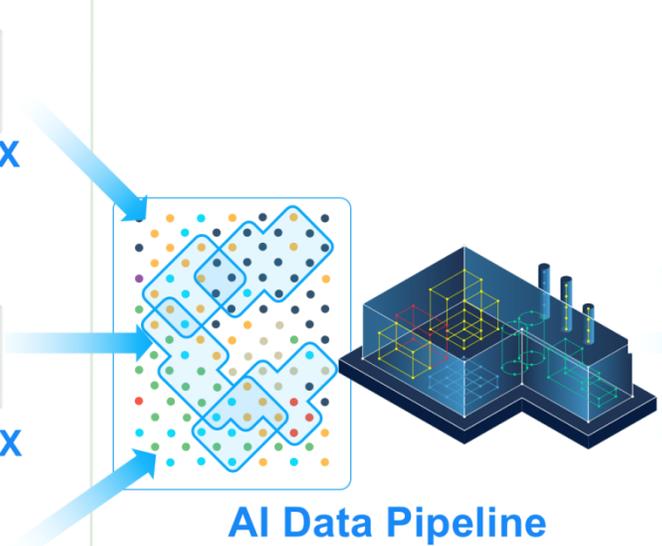
Fog

Cloud

Acquire, translate, and package for relay



AI enabled data preparation and a customized digital twin of the customer's plant/enterprise



Contextual dashboards with real-time data

Visibility Tools



Analytic Tools



- Machine Operators
- Line Supervisors
- Process Engineers
- Data Scientists
- Plant Operations
- Corporate Operations

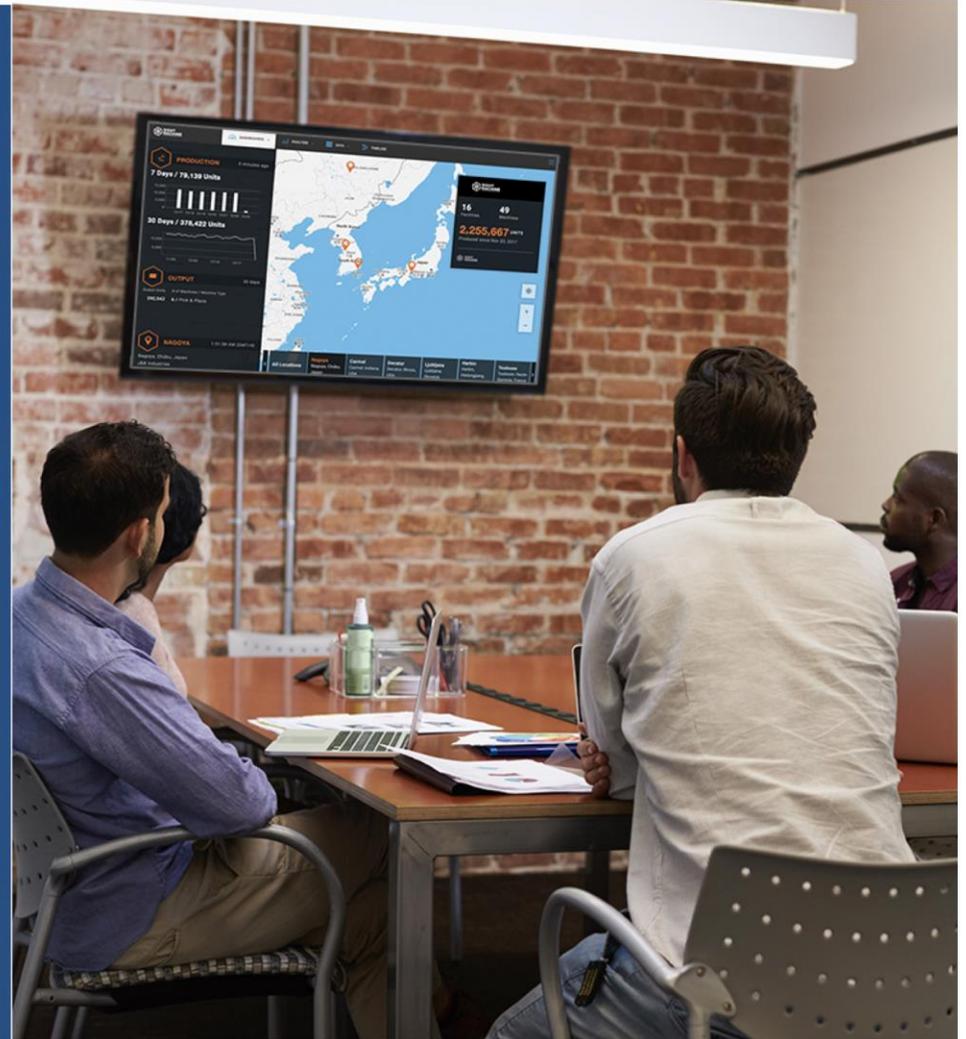
What True Transformational Capabilities Look Like

PROBLEM

\$32B Manufacturer with 500 contract manufacturing facilities attempting to gain performance visibility across a wide network of plants, including contract manufacturers, to better understand capacity constraints and eliminate the need to build/source additional manufacturing capability

SOLUTION

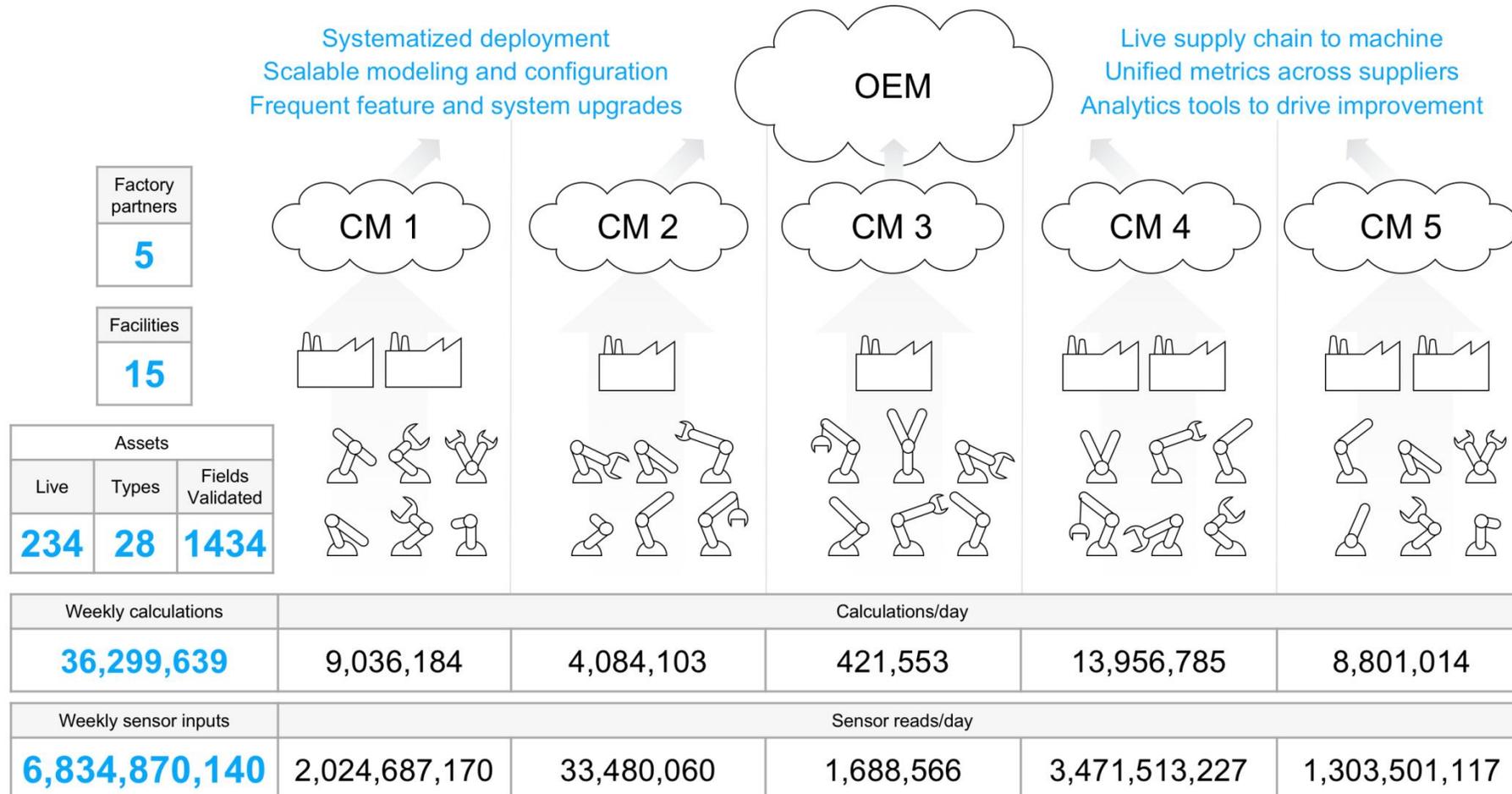
Sight Machine implemented across plants enables previously unattainable visibility and improved production consistency across the supply chain



Case study: Visibility across the supply chain

A “root system” for a global leader’s manufacturing base

Benefits: improved asset performance, accurate costing, better supplier and production management, sustainability



Solution Provider / Use Case

Vatsal Shah

CEO, Litmus Automation



Vatsal Shah | Vatsal@litmusautomation.com
Co-Founder & CEO

Company Overview



Our Offerings



machnation

2018 Leading IoT
Edge Vendor



McROCK
CAPITAL

2017 IIoT Entrepreneur
of the Year



The world's best companies use LoopEdge and LoopCloud to drive IoT growth & revenue.



RENAULT



FLORIDA TURNPIKE SERVICES



Hewlett Packard
Enterprise



Auto Sensor-ing & Auto Direction



Westburne

REXEL GROUP



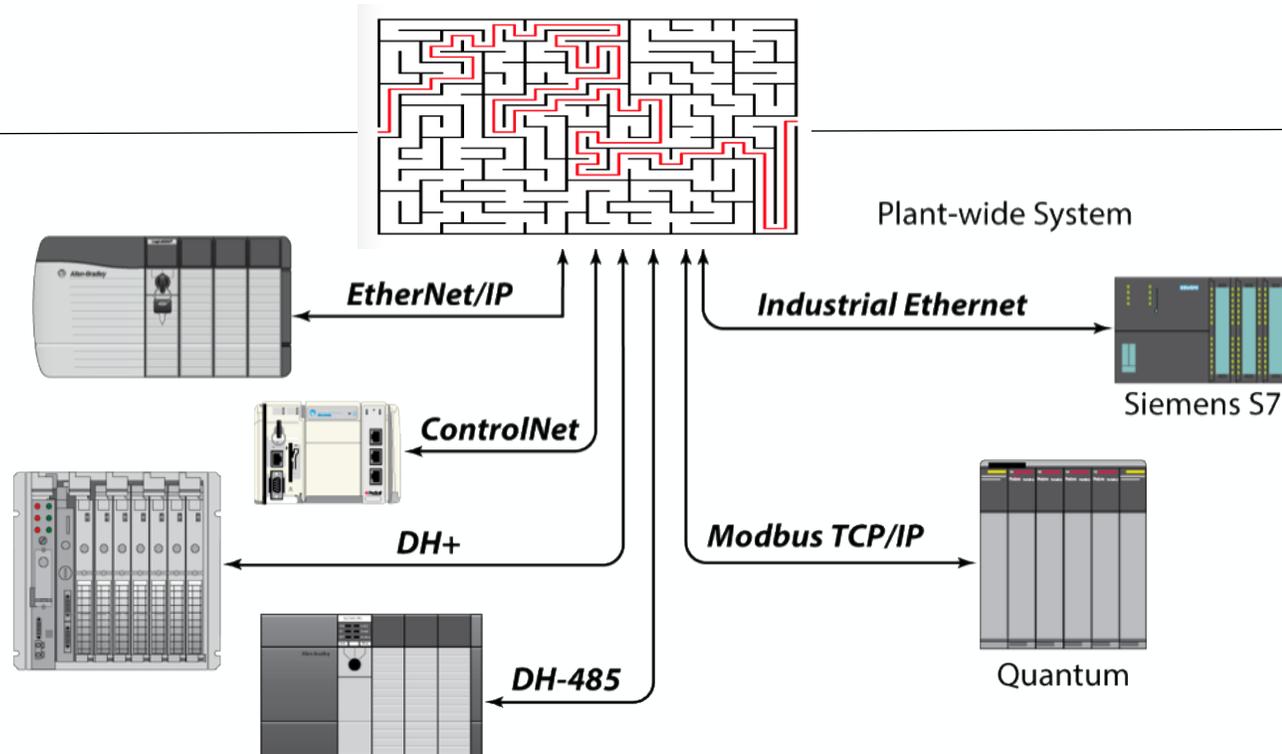
KNEMATS

Where did it all start?

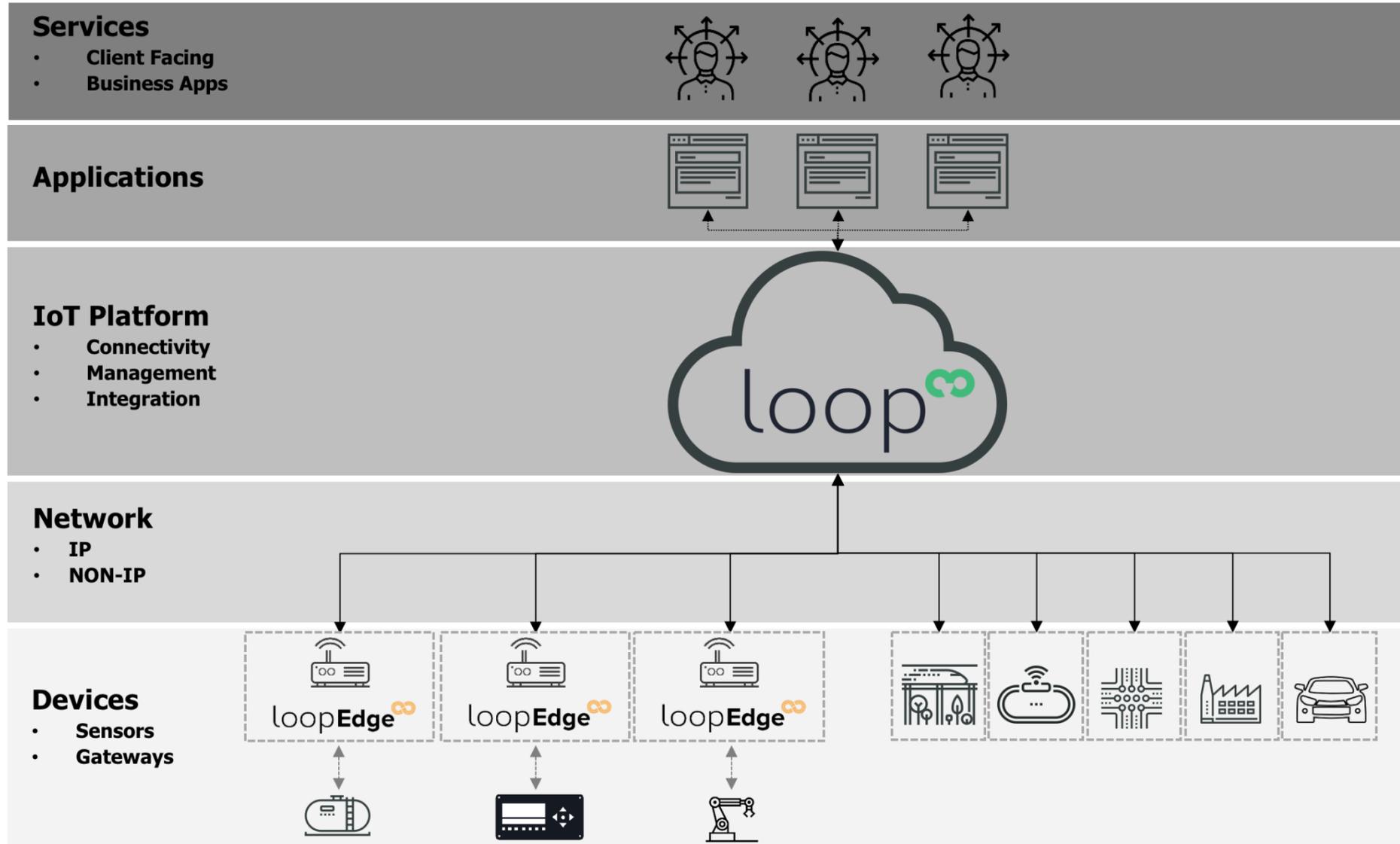


IoT / Industry 4.0
Introduced a puzzle

The day
we started



lit



loopEdge

Industrial Device
Connectivity

Device, Data and
Deployment
Management

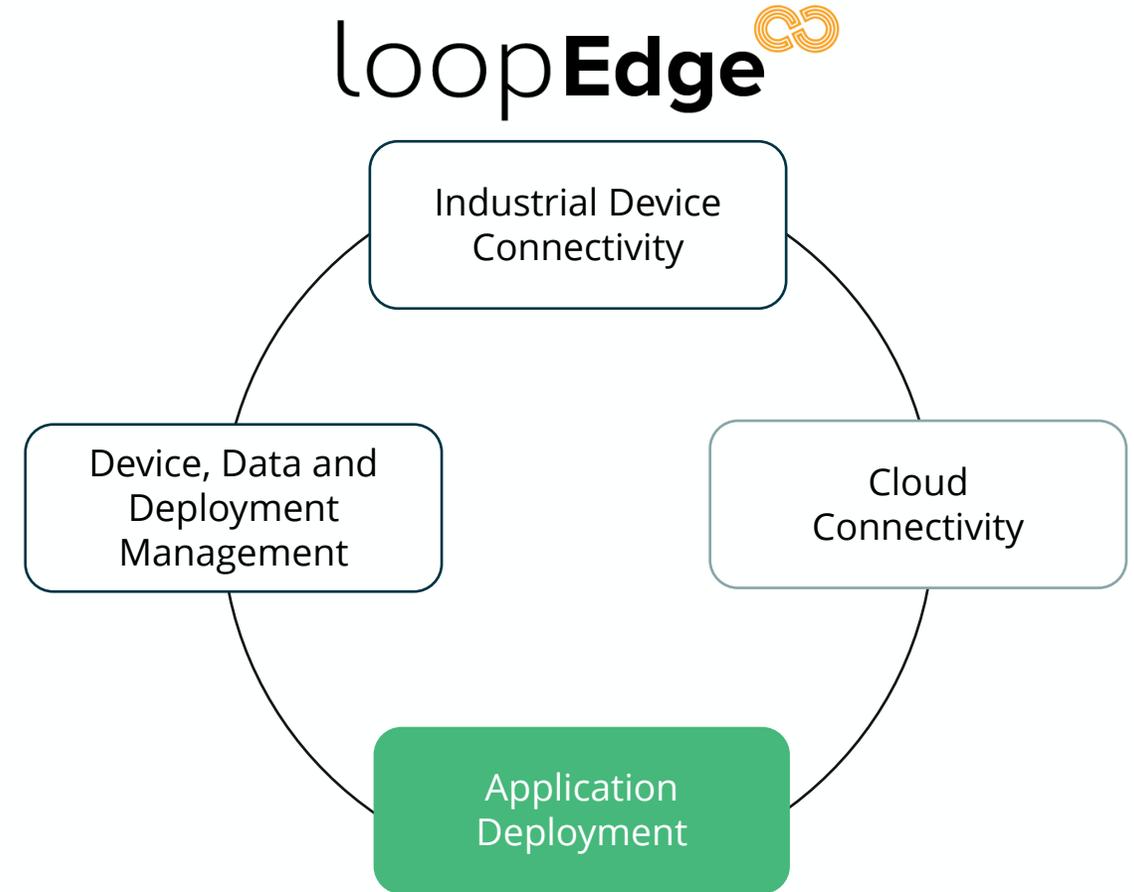
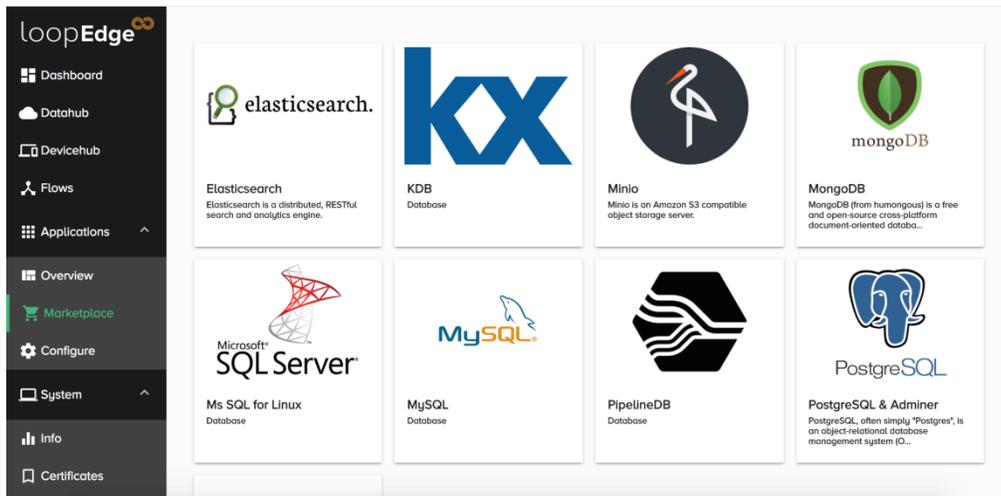
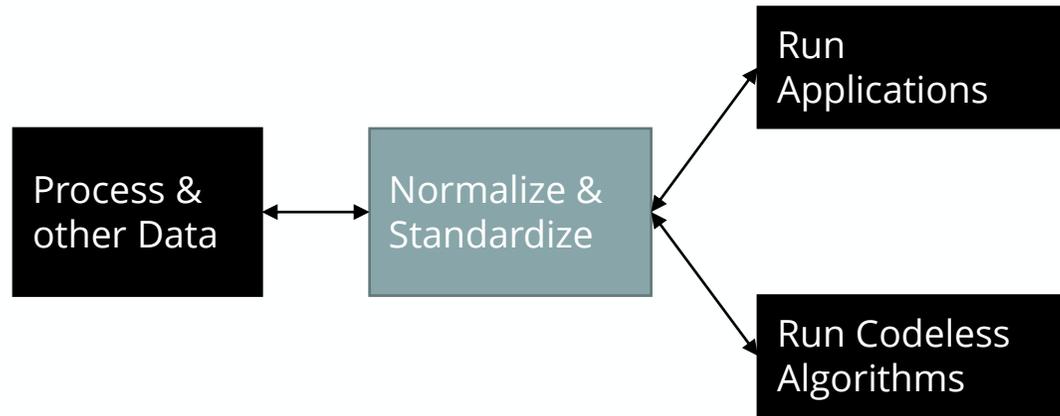
Cloud
Connectivity

Application
Deployment



+ 1000s more

- World's 1st **Artificial Intelligence driven Industrial device connectivity**
- **Securely** Connect and collect data from industrial systems – **In a Few Minutes**



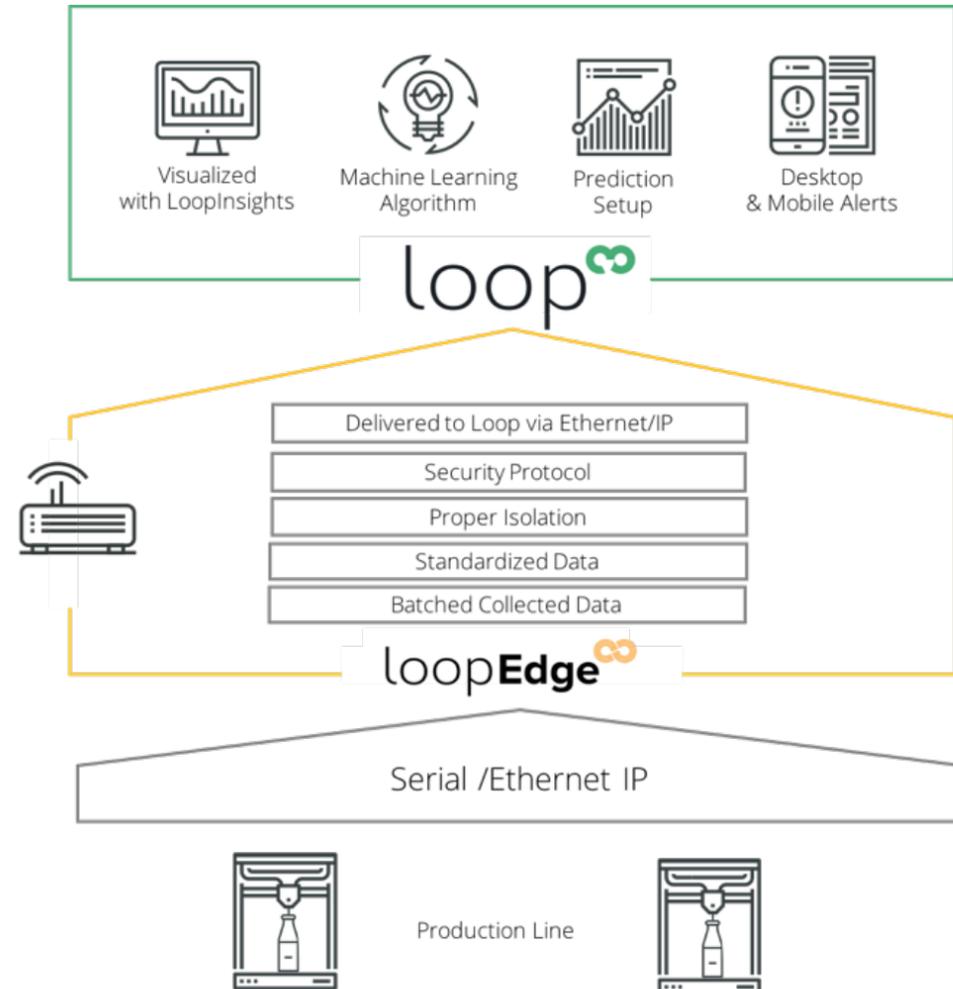
- World's 1st Edge Computing Marketplace
- 45 + Apps : Database, Analytics, Machine Learning, Visualization, Smart Alerting

Usecase 1 : Machine Health & Anomaly Detection

Company: Multinational Beverage & Brewing Company

Problem Statement

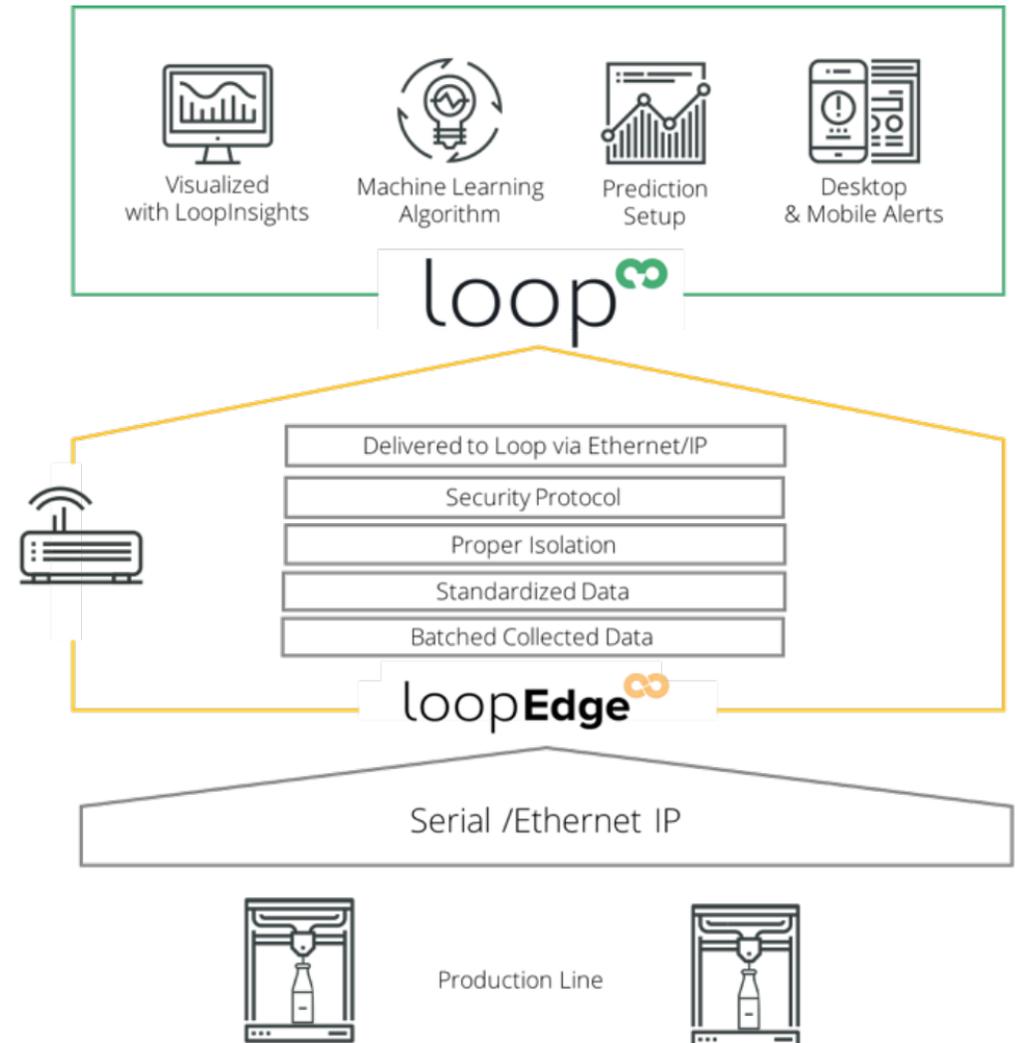
- Production line anomalies caused by **old machine systems** often require long-term and costly maintenance.
- It was common that the **brewing process would be down for several hours** when malfunctions would occur in their old machines.
- Instantaneous cost of failure :
~6000 USD / Hour



Company: Multinational Beverage & Brewing Company

Solution Journey

- LoopEdge installed to collect direct **Allen Bradley and PI Historian** real time data.
- A machine learning algorithm and **anomaly detection system** ran on top of the LoopEdge
- **LoopInsights** (on the cloud) displayed the data and results.



Company: Multinational Beverage & Brewing Company

End Result

- Detected the downtimes 9 hours in advance to plant manager
- Maintenance alerts were generated and backup system was arranged
- Data was tagged for future reference



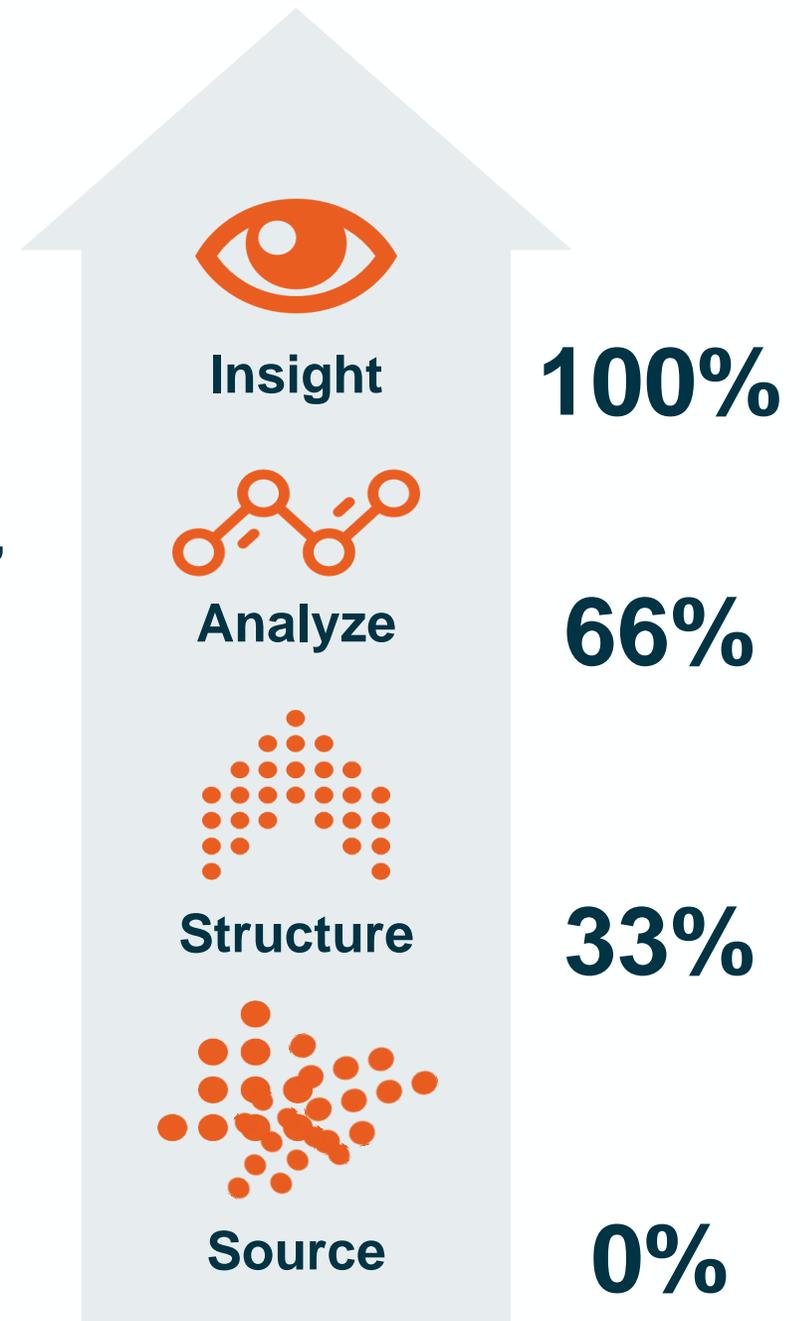
Summary, Observation, Predictions

Jim Fletcher

Strategy Partner, Momenta Partners

Analytics Must Produce Insights to Add Value

- **Complex Event Processing (CEP) can be moved to the Edge**
- **Domain-specific analytics models** can be developed, iterated, and quickly deployed
- **Analytics** will be used for the **specific business domain** and **for managing the infrastructure**
- Analytics must move from “**words and numbers**” to “**automated actions**”
- **Technologies such as Augmented Reality will become the norm** for human visualization of complex information



Edge Dynamics Will Shape Industrial IoT Evolution

Analytics, business processes will increasingly define Edge scenarios

Critical mass for business process will migrate to the Edge

- The most important business decisions will take place at the edge
- The analytics loop will cycle more quickly and become more agile
- Machine learning & AI will empower the ability to turn data into insight into action
- The business core/cloud will focus on learning, propagating historically driven insights to the edge

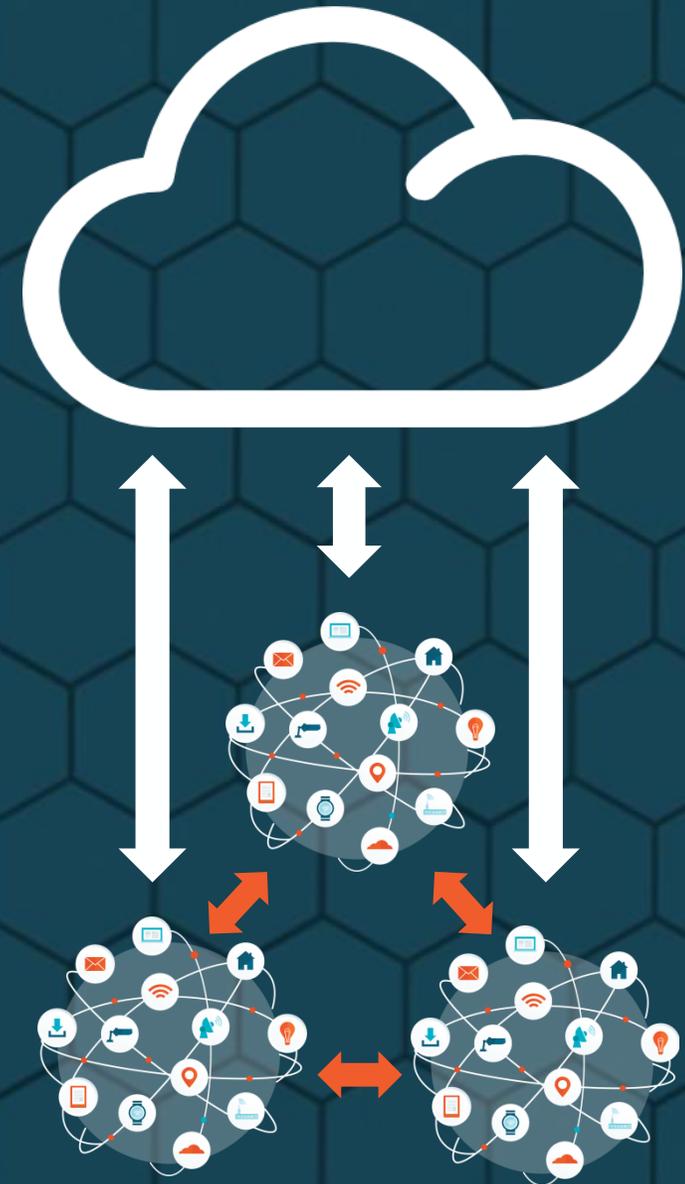
Strategically, the Edge becomes the “Socket Battleground”

- Devices (the physical edge) are well established, dominated by ARM
- Cloud (Public, Private, Hybrid and On-Premise) are well established dominated by INTC

IOT Hives

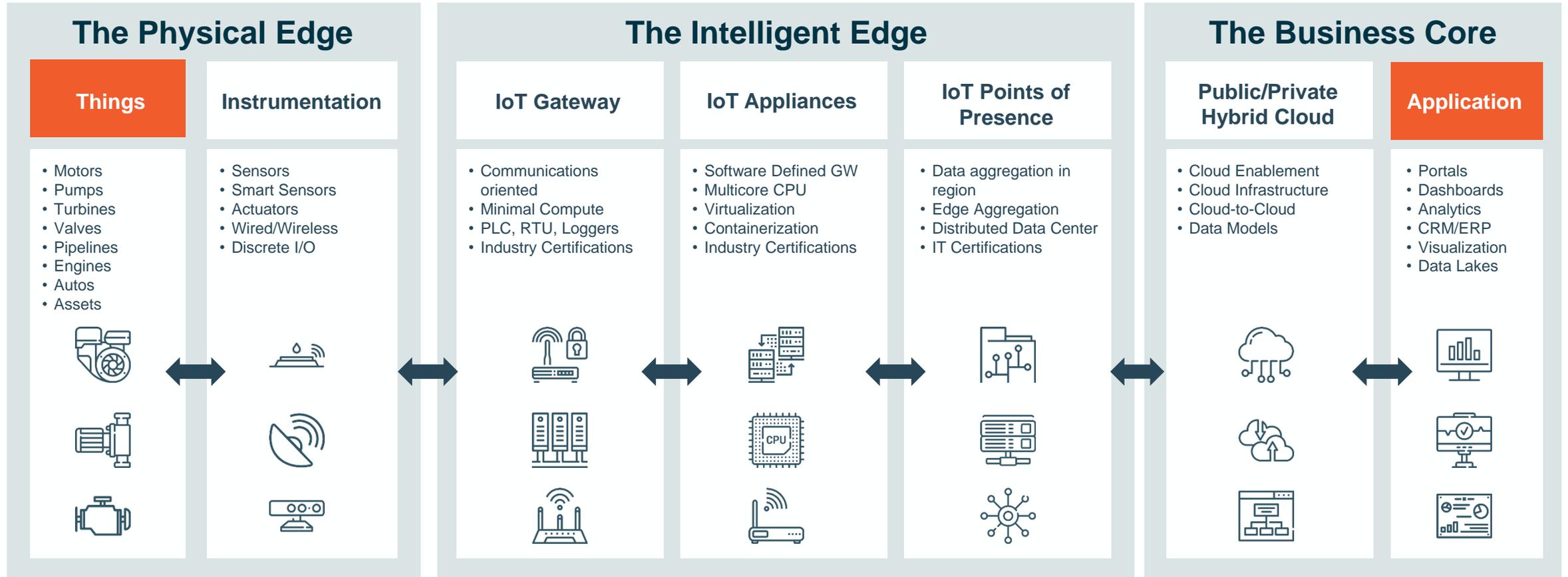
A Hybrid of Cloud, Fog, and Edge

- **We need an aggregate model**, encompassing the isolation of the edge, with the power of selective aggregation
- **Edge “hives” are aggregations of processes** that can operate autonomously and also can share/learn with other hives and clouds
- **Hives can be physical or logical aggregations**
- **Containers can be aggregated into hives**



Industrial IoT Embraces the Edge

From Physical Edge through Intelligent Edge to the Business Core



Wrap up and Q&A

**Please submit questions
via GoToMeeting**

MOMENTA PARTNERS

THANK YOU

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