The Digital Transformation Journey

Presenters

Travis Cox

Chief Technology Evangelist

Inductive Automation

Digital Transformation Disruption

Driven by Data

Access to Information

Real-time Connections

Greater Collaboration

The ‘Data-fication’ of Industry

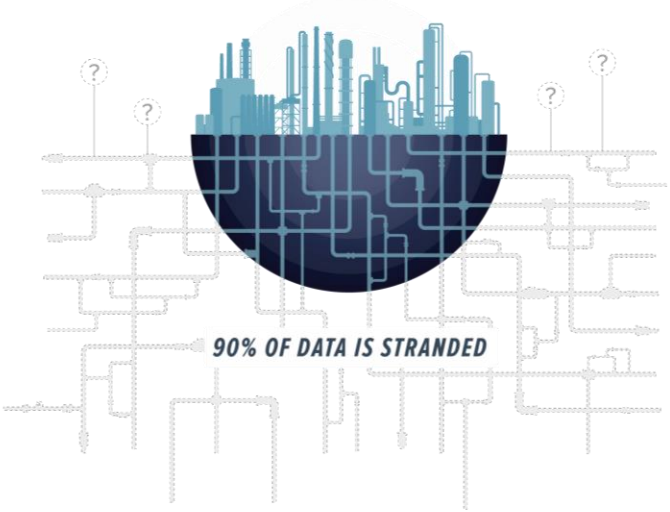
The unprecedented increase in data is changing *everything*

> “the ongoing digitization and ‘data-fication’ of industry”
> - Smart Industry Magazine

Digital Transformation Challenges

Many companies are striving to accelerate their Digital Transformation

- Lots of stranded data
- Difficulties in storing OT data
- Complexity of moving / mapping data
- Lack of open standards
- Lack of standardized data modeling
- Expensive to transfer, store, and analyze data



The "Reality" of Digital Transformation

inductive automation

The Proposition

Looks Simple

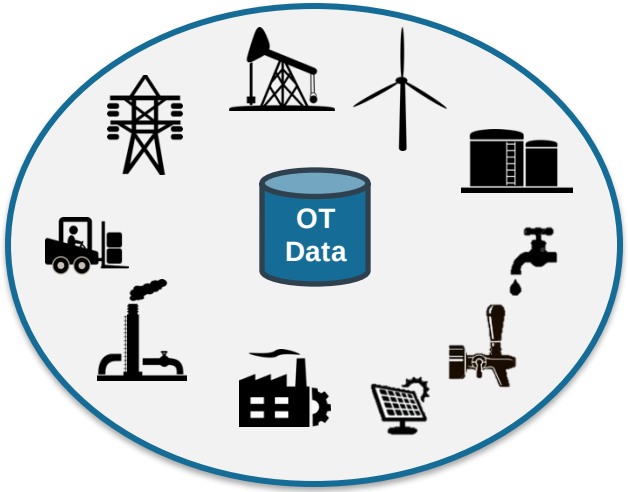
IT/Cloud Tooling

OT Data

The Reality

IT/Cloud Tooling

It's Difficult



What is Digital Transformation About?

Digital Transformation ***is not***:

- Technology for technology's sake
- Putting new technologies on top of old technologies

Digital Transformation ***is***:

- A comprehensive shift in the way we do business
- About identifying areas of improvement, then making improvements in an intentional, methodical, and measurable way by leveraging modern technologies

What is Digital Transformation About?

Creating a playhouse

- Known methods to use
- Difficult or impossible if approached the wrong way

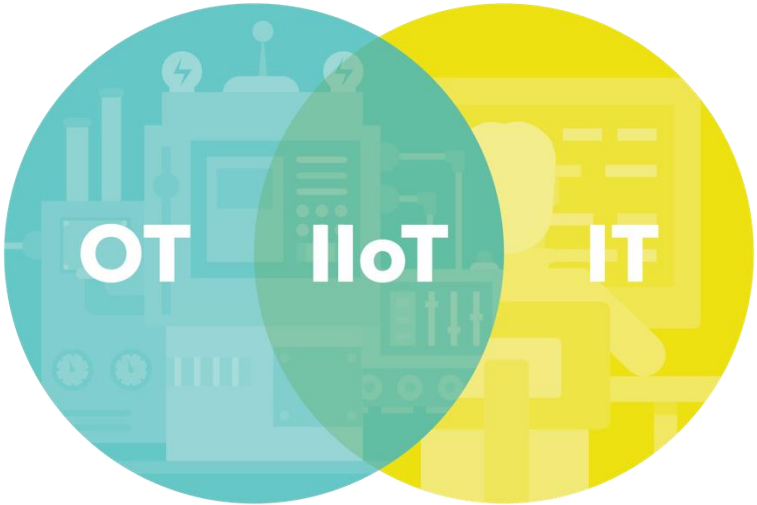
What is Digital Transformation About?

Choosing the right toolset

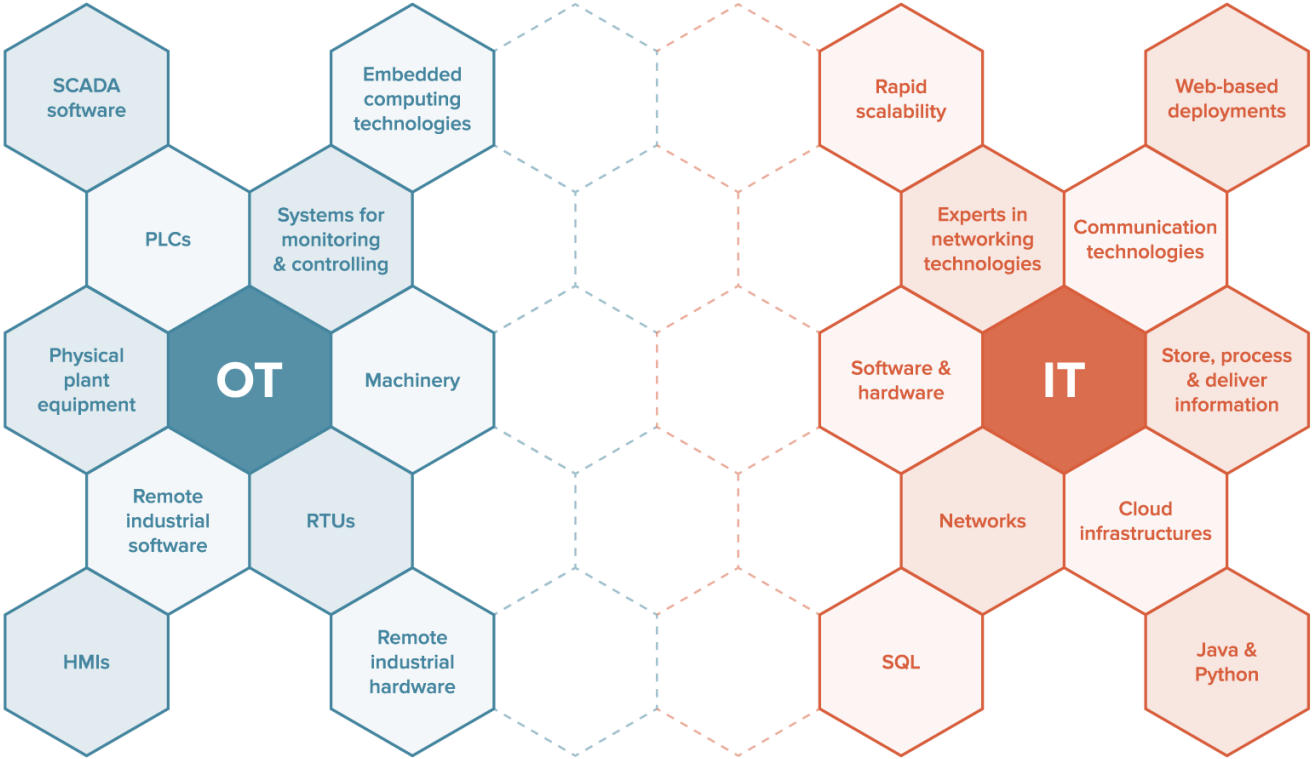
- Start with something well known to solve problems
- Stick with standard tools that aren't proprietary
- **Working together to solve business goals!**

OT / IT Convergence

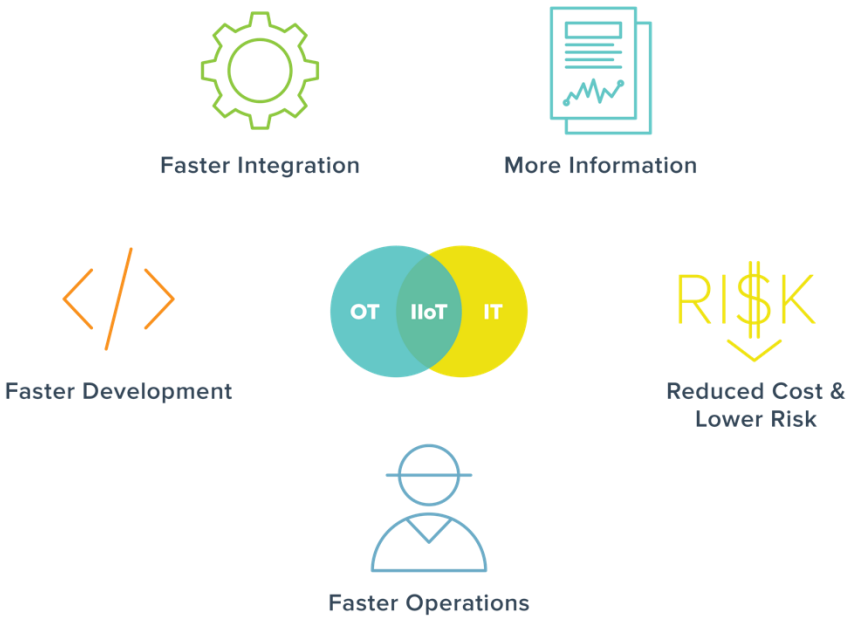
inductive automation



Skill Sets Benefit Each Other



Benefits of Convergence



3 Types of Convergence

Culture

Technology

Data

Culture Convergence

Convergence cannot happen without acceptance and adoption across the organization

- Sponsored by executive and senior leadership
- Facilitate cooperation between departments
- Motivate employees and get them involved
- Identify business goals and objectives
  - Which problem would we like to solve first?
- Don’t take on the world, break into achievable steps
- Collaborate on architecture & tools

Culture

Technology Convergence

Leveraging IT Tools and Best Practices

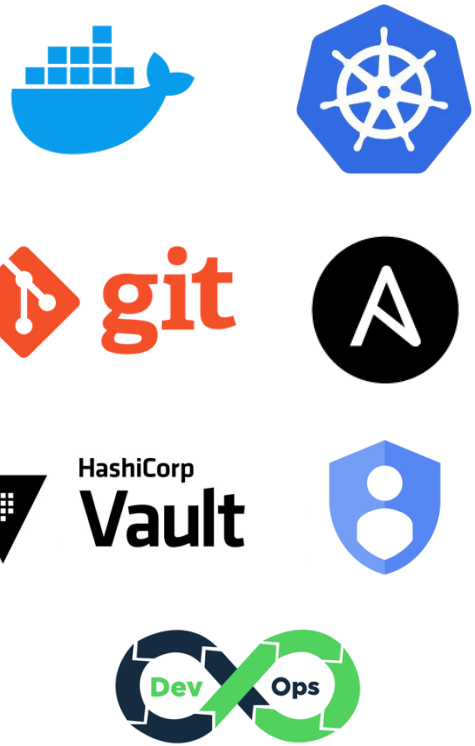
- Requires OT tools that leverage IT technology
- Movement away from proprietary or siloed systems
- Fully leveraging the best of IT in OT
- Full integration with IT systems

Technology

Technology Convergence

Manage OT on an enormous scale

- Deploy using Docker or Kubernetes
- Leverage version / source control
- Centralize authorization with Identity Providers
  - SSO & Multifactor Authentication
- Centralize secrets and certificates
- Fleet management using orchestration tools
- Leverage DevOps
- OT products ***MUST*** support these tools



Data Convergence

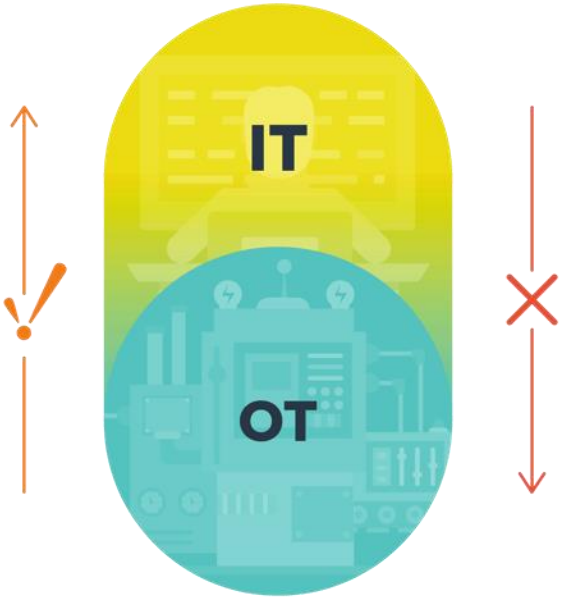
Provide data to business through infrastructure

- Focus area for most organizations
- Tons of data on the plant floor or in the field
- Data is critical to the business
- Approach is critical
  - Your data
  - Your tools
  - No vendor lock-in
  - Leverage open standards

Data

OT First Mindset

Convergence should be led by
OT from the bottom up



Top-Down Approach Example

inductive automation

! Requires additional skills, programming, administration, costs, etc.

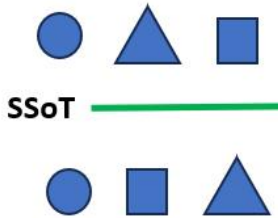
*Single Source of Truth - **SSoT***

Unified Name Space ???

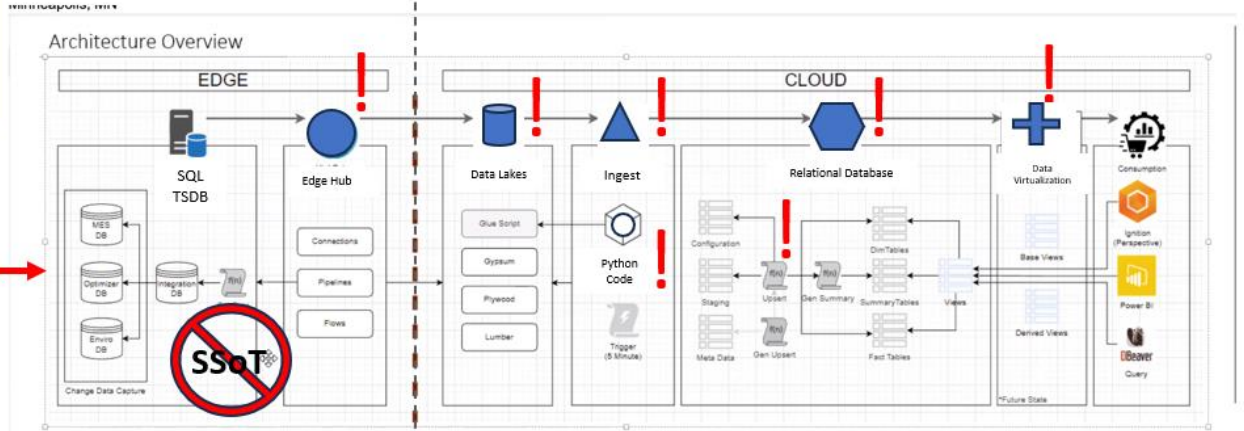
Business Outcomes ???

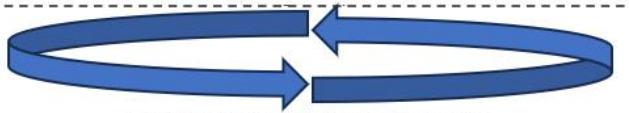
Once the OT Process Variables hit a Time Series Database on prem, all **SSoT** contextual data is stripped off! On prem TSDB are probably required but Should Not be used to provide machine models/assets/measurements to the Cloud.

Factory



Existing SCADA Automation System
Ignition
Aveva
Rockwell
Etc.





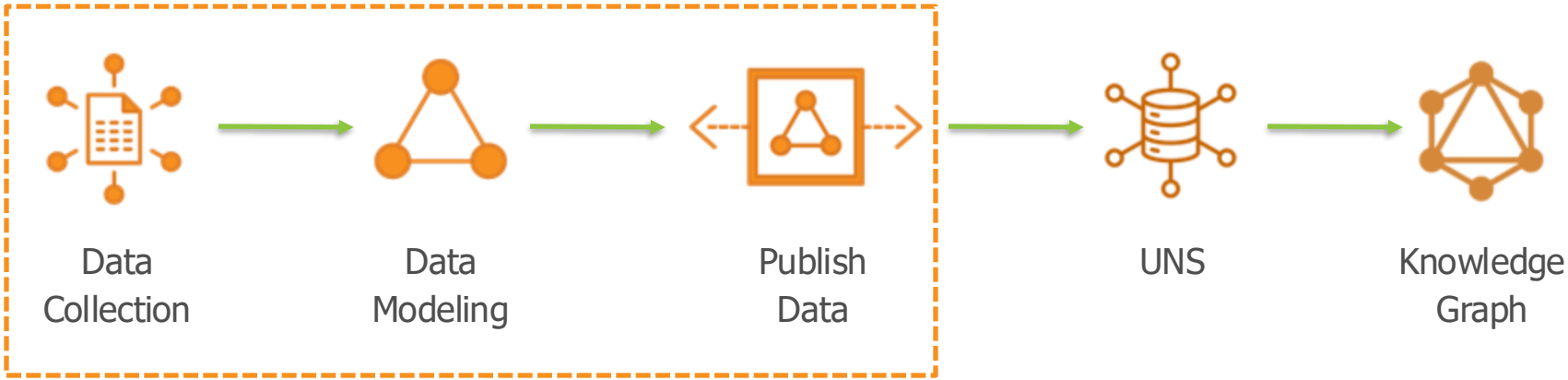
Vicious circle of trying to keep the facility in sync with the cloud.

OT First Mindset

inductive automation

When a solution makes sense for OT and IT, you won't get resistance!

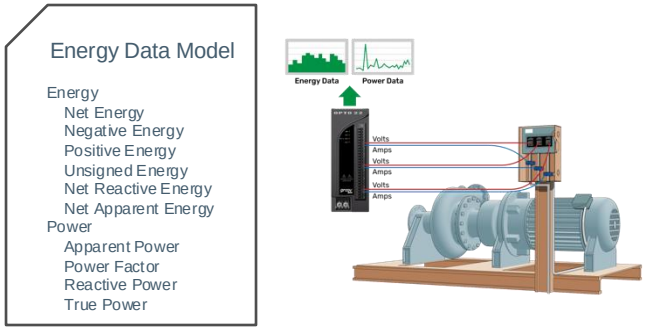
OT Data Journey



Data Modeling

What is Data modeling?

- Organizes elements of data
- Standardizes how they relate
- Mimics real world objects
- Provides context (engineering units, expected range, asset, etc.)
- Easy to understand & consistent
- Defined at the edge

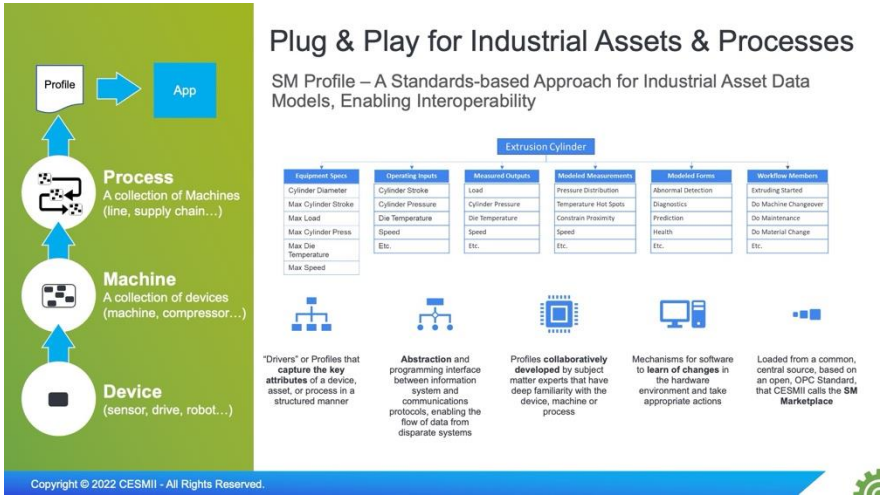


Data Model Standardization

inductive automation

Why Standardize?

- Promotes consistency across the entire enterprise
- Enhances data quality
- Enables interoperability
- Enhances decision-making (AI & ML)
- Facilitates UNS



CESMII THE SMART MANUFACTURING INSTITUTE

OPC UA Part 5

Leverage Open Standards

inductive automation

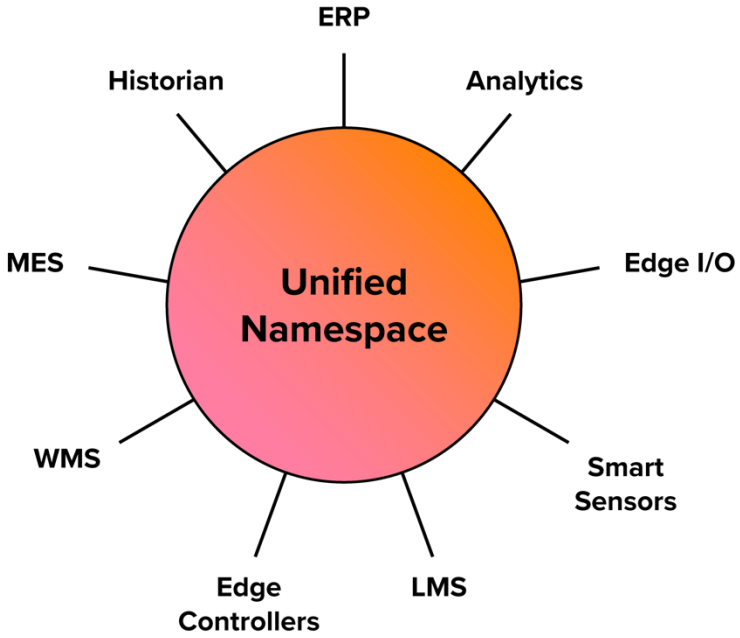
Open Standards Promote Interoperability

- Enable seamless data exchange
- Encourage innovation
- Open access to data
- Avoid vendor lock-in
- Easier to select and deploy systems
- Key to a UNS

Unified Namespace

Centralized repository of data

- Standardized way to organize and name data
- Single source of truth for all data and information in your business
- Contains current state of the business
- Provides centralized access to data (hub)
- This is a ***CONCEPT***
  - Made up of multiple products and open standards



Benefits of a Unified Namespace

inductive automation

Benefits of a UNS

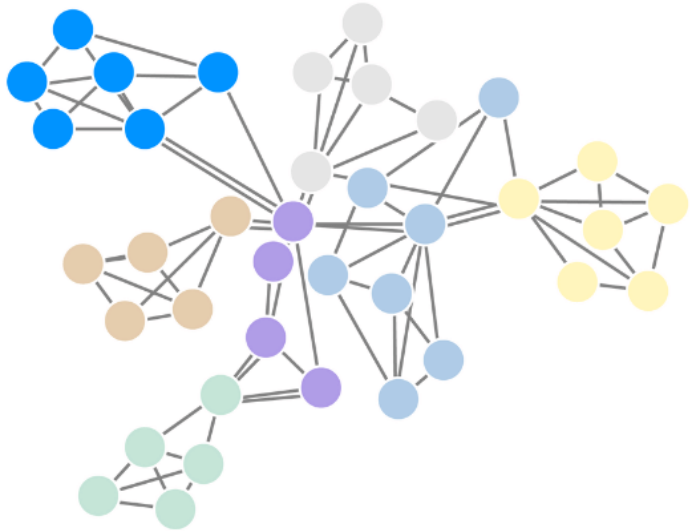
- Breaks down data silos
- One-stop access to all enterprise data
- Greater scalability
- Lower costs
- Simple integration
- Improved efficiency and better decision making
- Reduced network complexity
- Less manpower/engineering

Knowledge Graph

inductive automation

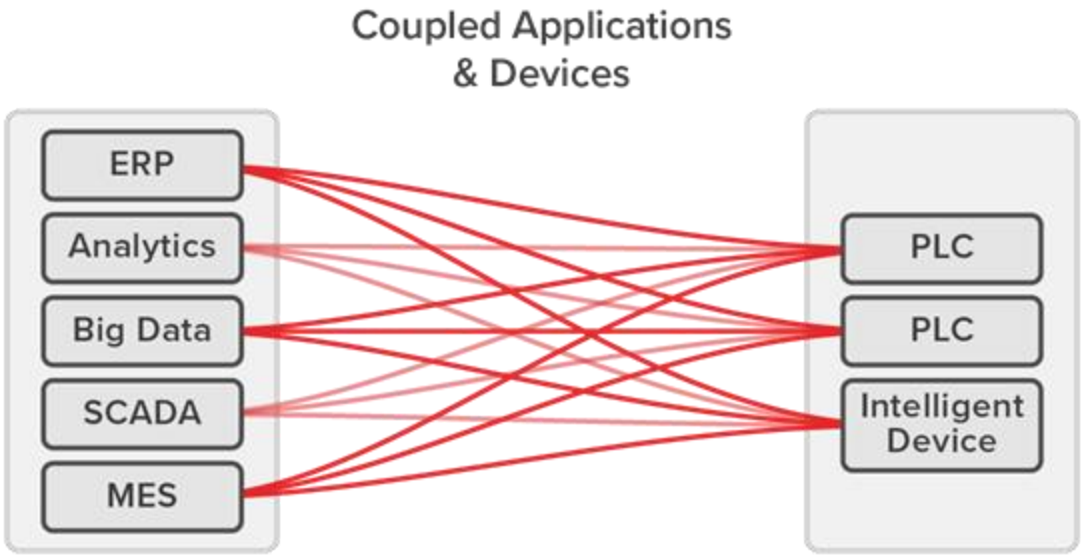
Build relationships to your data

- Representation of real-world entities & their relationships
- Typically stored as a graph database
- Can represent objects, events, situations, concepts
- Stored in the cloud (AWS & Azure)
- Provides deeper insights
- Facilitates generative AI
- Crucial for supply chains

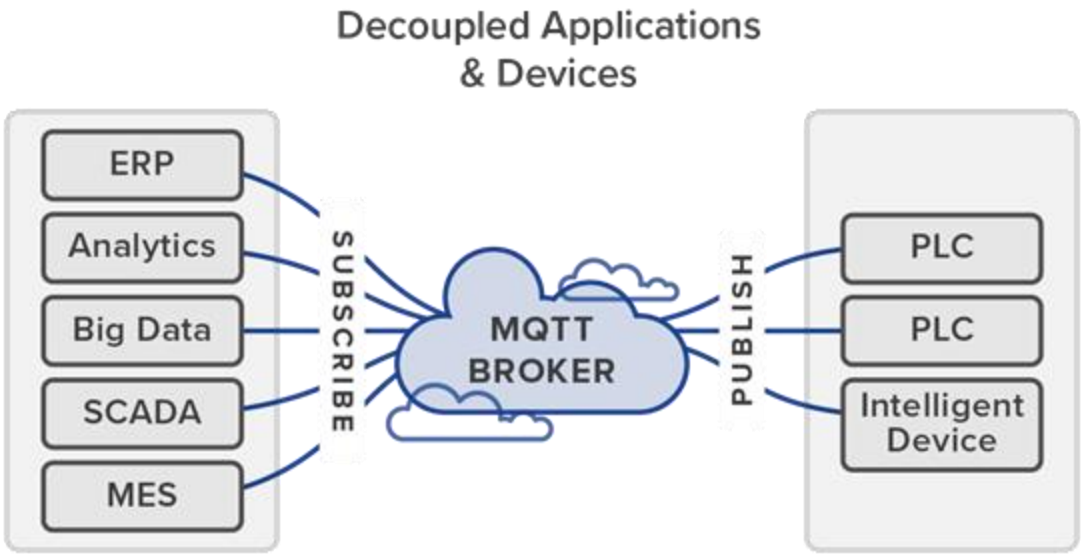


How can I achieve a UNS?

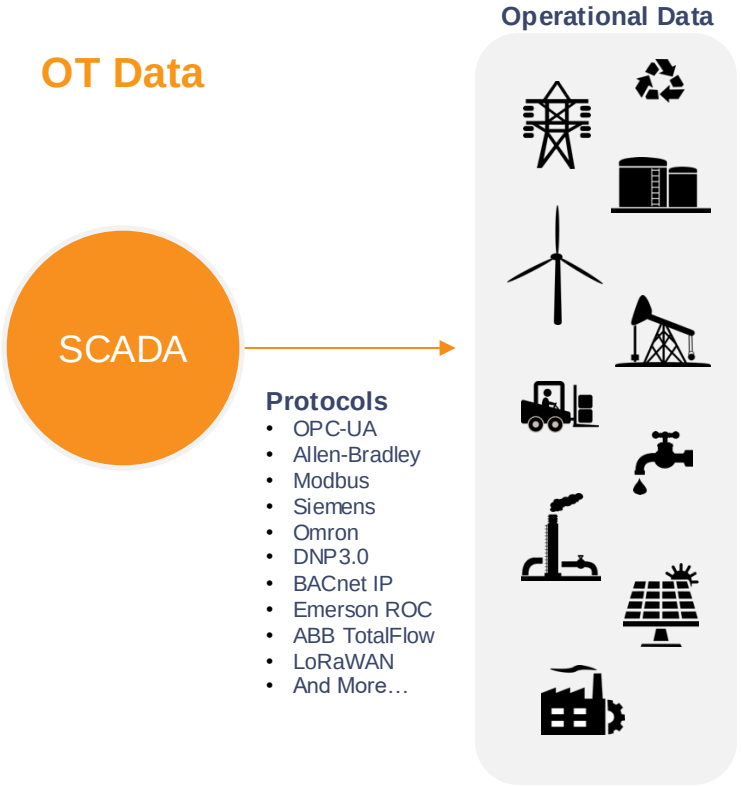
Legacy SCADA Architecture



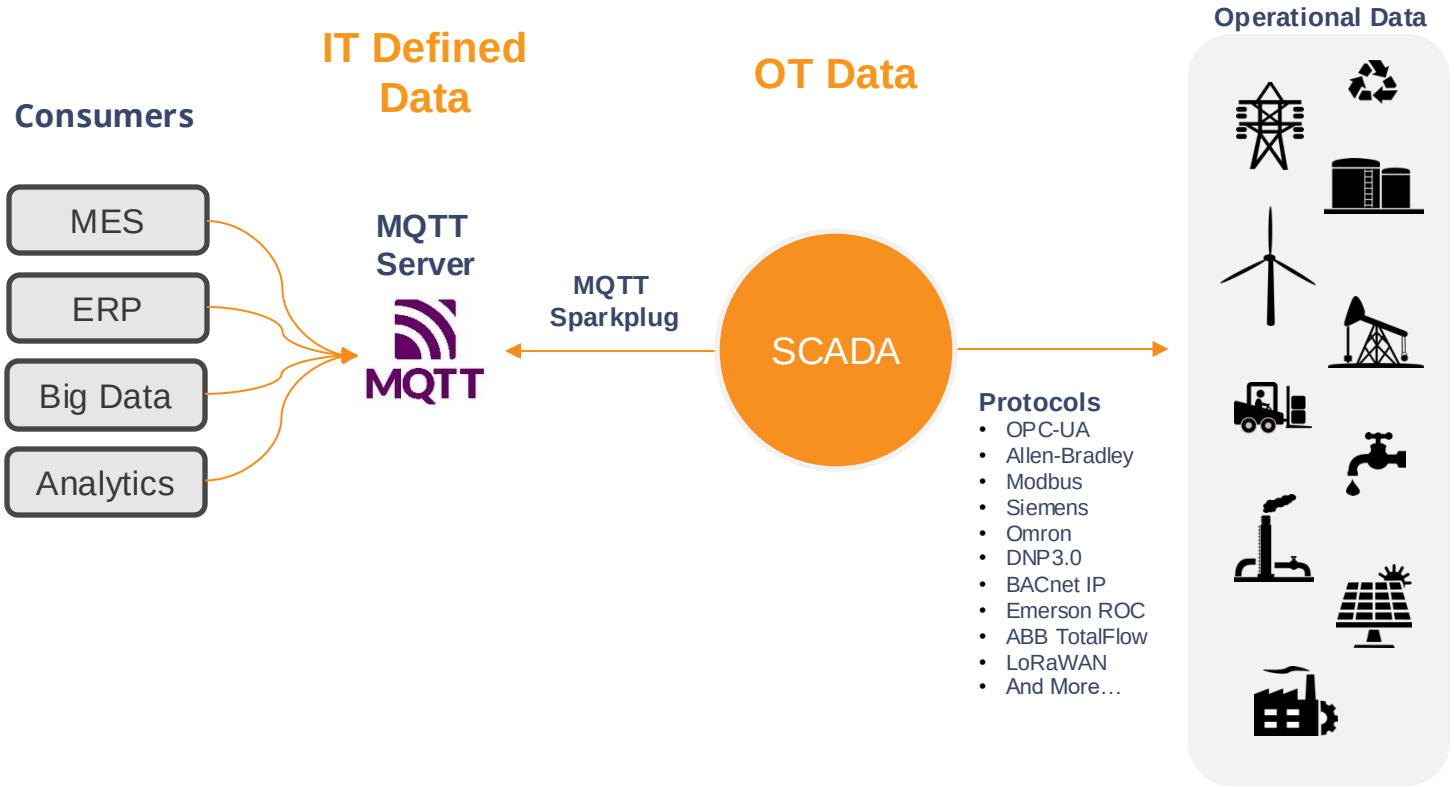
Modern SCADA Architecture



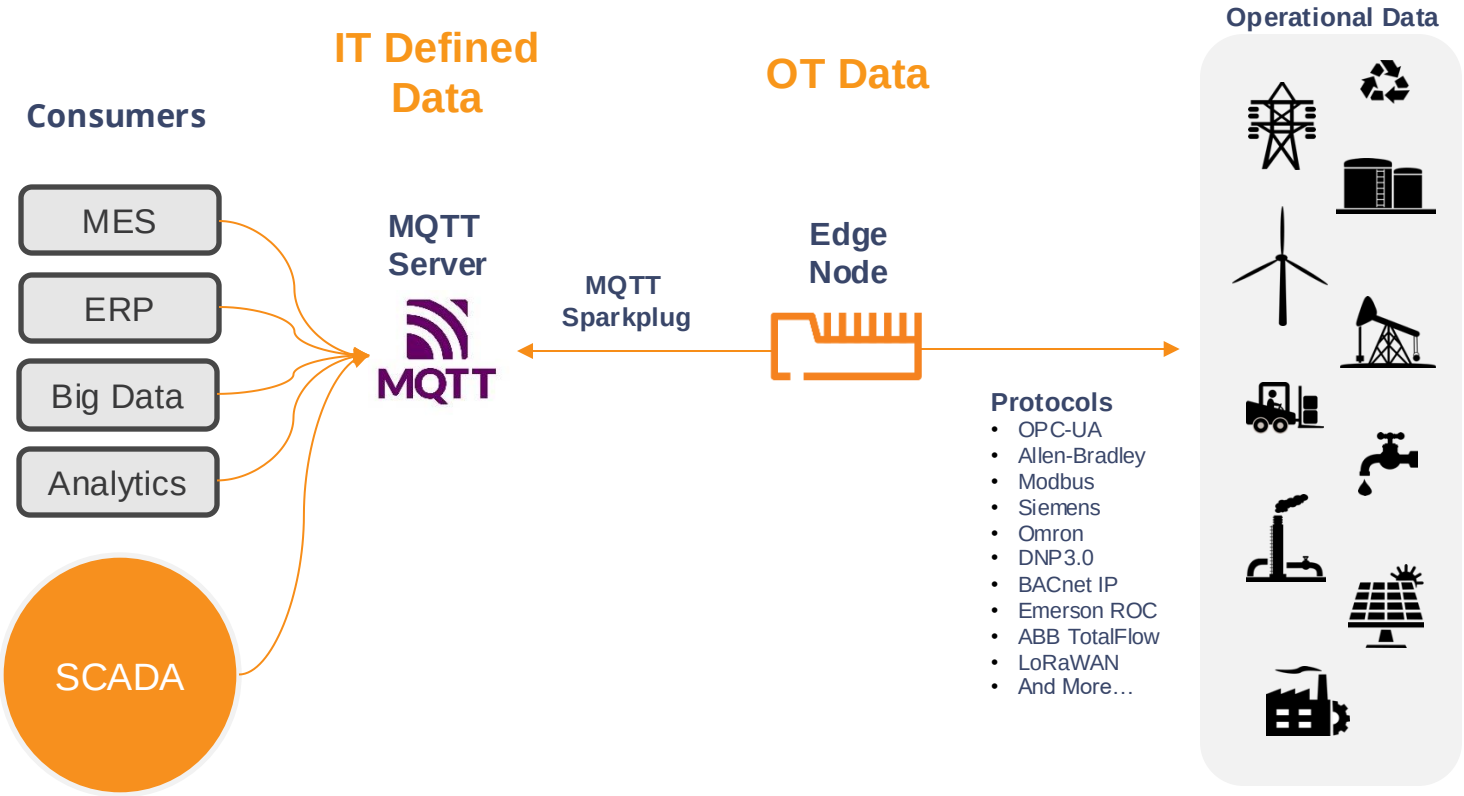
Modern SCADA Architecture



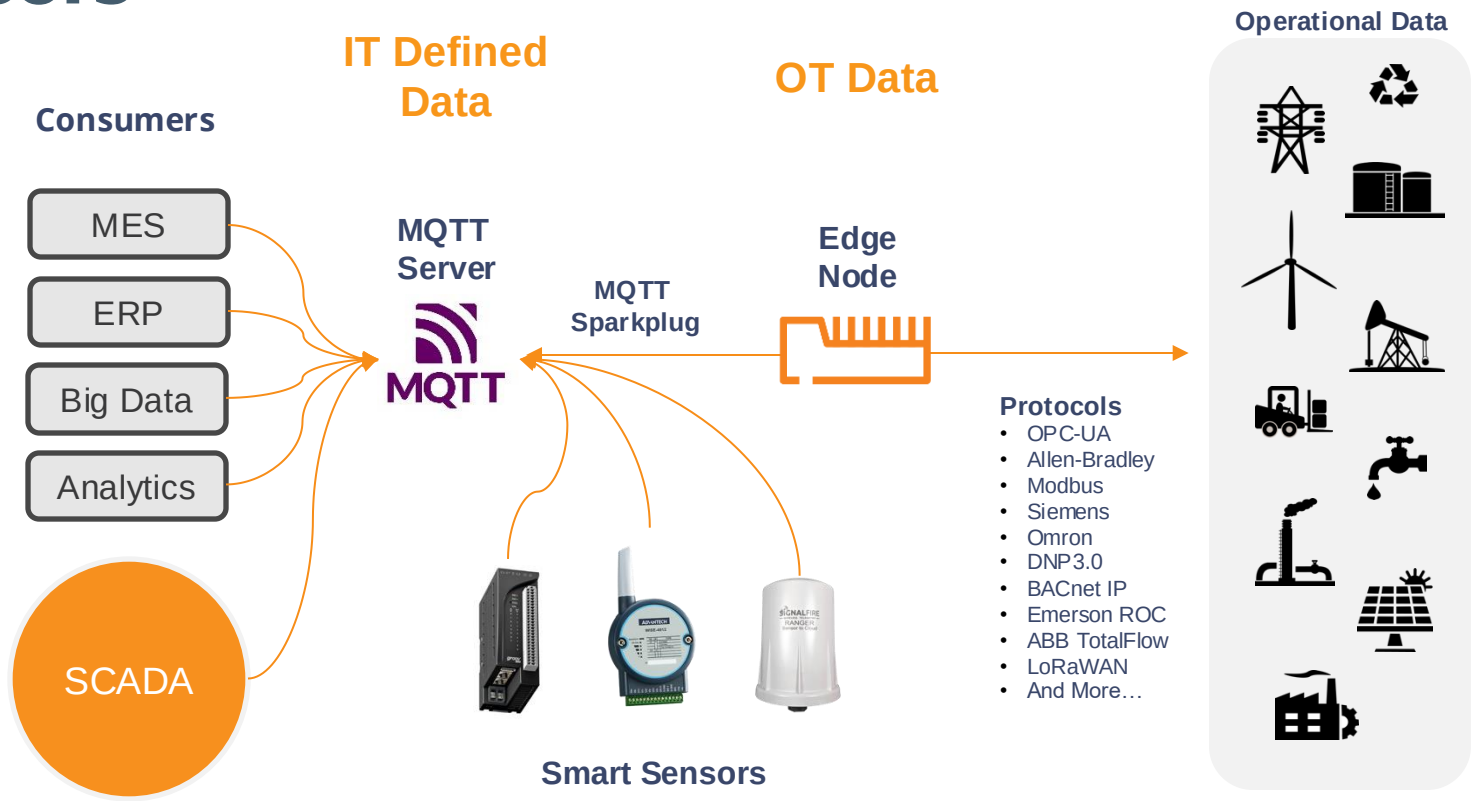
Modern SCADA Architecture



Introducing Edge



Introducing New Smart Sensors



Recap

inductive automation

True convergence requires mindset and culture change

- Single source of truth, OT first mindset
- Possible to implement using today's technologies
- UNS is critical for digital transformation
- Requires a different architecture
- Standardize on data models with context
- Important to leverage open standards and IT tools
- Put together solutions with best-in-class products (interoperability)
- Put together a solution that works for you
- Start small and get ROI
- Rinse, repeat!

Thank You!