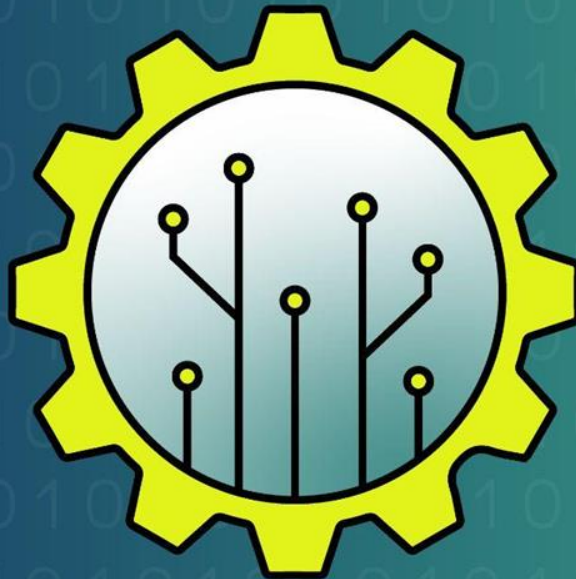


Solving Data Problems to Accelerate Digital Transformation



Speakers



Kevin McClusky

Co-Director of Sales
Engineering
Inductive Automation



Arlen Nipper

President & CTO
Cirrus Link Solutions

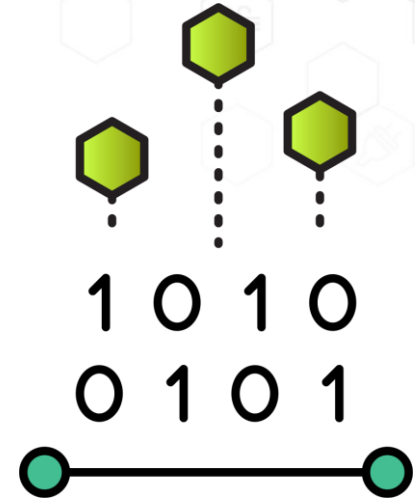


Eric Hollering

Software Architect
Flexware Innovation

Agenda

- What Digital Transformation is Really About
- Data Problems
- Using Ignition for Digital Transformation
- Success Stories
- Benefits of Ignition
- Audience Q&A





The Unlimited Platform for SCADA and So Much More

- **Connect, Design, Deploy Without Limits:**
 - One central hub for everything on the plant floor
 - Create any kind of industrial application
 - Web-deploy clients to desktops, industrial displays & mobile devices
- **Unlimited licensing**
- **Industrial-strength security and stability**
- **Trusted by thousands of companies worldwide**

What Digital Transformation is Really About



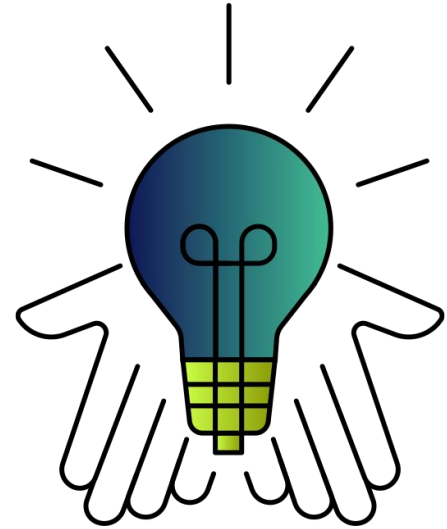
What Digital Transformation is Really About

Digital Transformation *is not*:

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

Digital Transformation *is*:

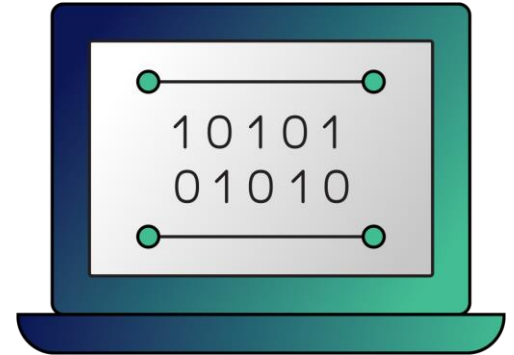
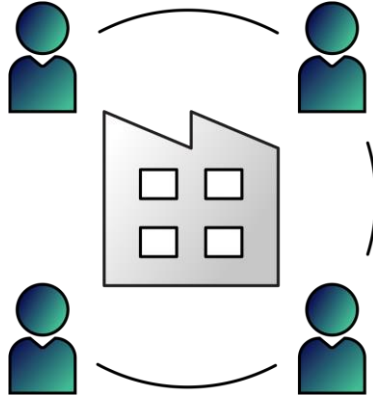
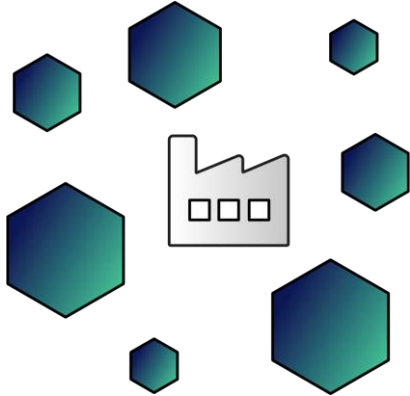
- A comprehensive shift in the way we do business
- About identifying areas of improvement, then making improvements in an intentional, methodical, and measurable way by leveraging modern technologies



What Digital Transformation is Really About

3 key areas:

- Processes
- People
- Programs



What Digital Transformation is Really About

Creating a playhouse:

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



What Digital Transformation is Really About

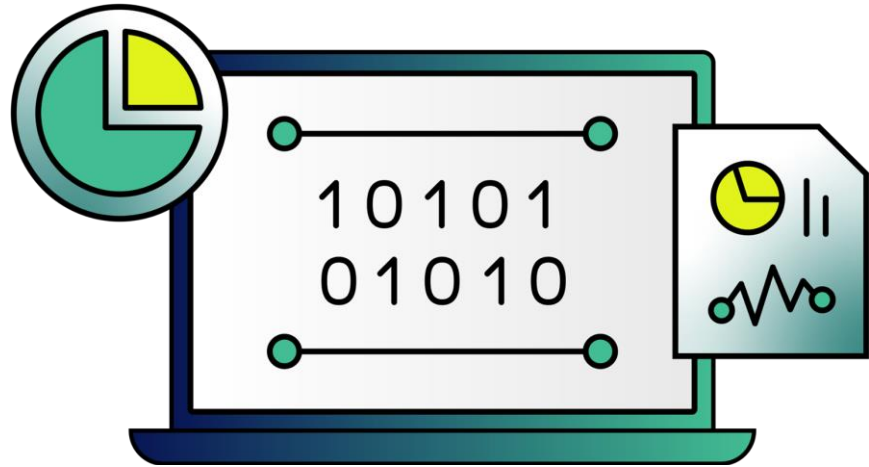
Choosing the right toolset:

- Start with something well known to solve problems
- Stick with standard tools that aren't proprietary



What Digital Transformation is Really About

One of the biggest Digital Transformation challenges:
How do you make the most of your data?



Data Problem: Stranded Data

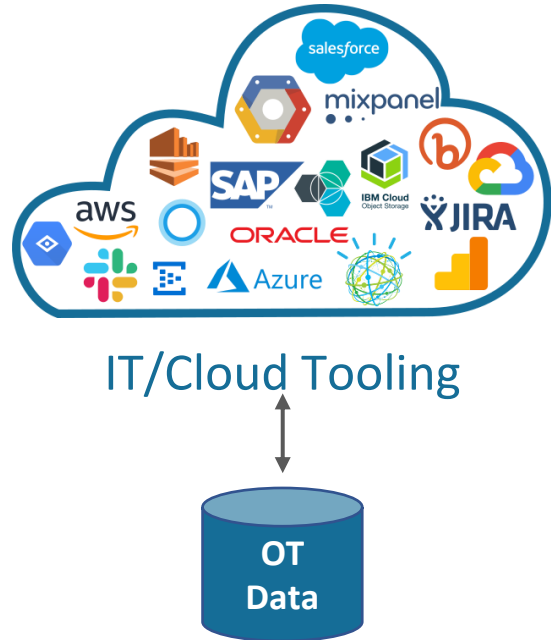
Companies aren't getting the data they need to make better decisions:

- 80% of data is stranded in the field
- Coupling devices with applications stops innovation
- Systems take too much time to set up

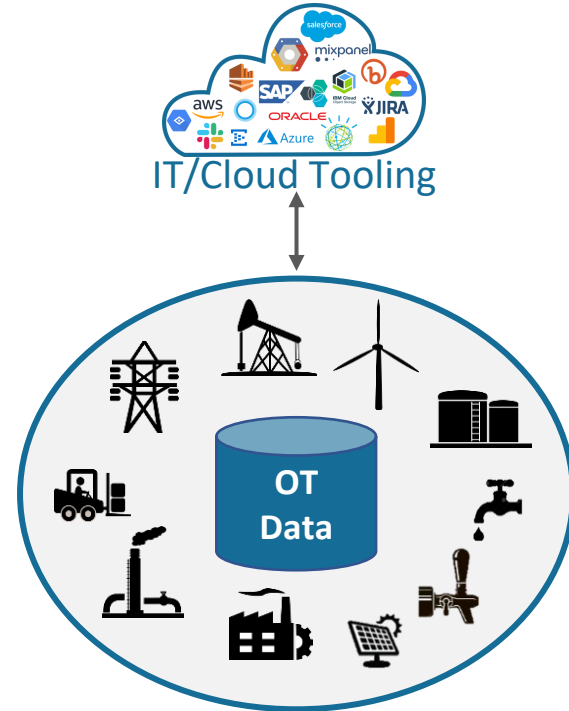


Data Problem: Proposition Vs. Reality

The Proposition (Looks Simple)



The Reality (It's Difficult)



Data Problem: OT Data Vs. IT Data

OT Data Consists of:

- Proprietary Protocols
- Multiple Data Formats
- No Contextual Information
- Designed for Operations
- Different Across Market Segments
- Poll/Response Data Retrieval
- Directly Coupled to Applications
- Isolated Networks

IT Data Needs:

- Data Objects/Modeling
- Standard Data Formats
- Contextual Information
- Decoupled to Enterprise
- Publish/Subscribe Methodology
- Easy to Integrate
- Secure

Ignition Brings IT and OT Together



Using Ignition for Digital Transformation



Collection



Data Modeling



Publication &
Subscription



Industrial &
Business
Application



Analytics &
Machine Learning

Using Ignition for Digital Transformation: Collection



Collection



Data Modeling



Publication &
Subscription



Industrial &
Business
Application



Analytics &
Machine Learning

Collection: Connect to Anything



Using Ignition for Digital Transformation: Data Modeling



Collection



Data Modeling



Publication &
Subscription



Industrial &
Business
Application



Analytics &
Machine Learning

Using Ignition for Digital Transformation: Data Modeling

Sparkplug Provides Standard for Modeling OT Data

Sparkplug B Specification Offers:

- Defines an OT Centric Topic Namespace
- Defines an OT Centric Data Model/Asset Structure
- Defines an OT Centric Extensible Process Variable Payload
- Defines MQTT State Management
- Sparkplug DOES NOT break or any in way modify the MQTT specification.
- **Sparkplug establishes a Single Source of Truth for Models/Assets/Tags at the Origin!**



Sparkplug

MQTT Topic &
Payload Definition

Using Ignition for Digital Transformation: Publication & Subscription



Collection



Data Modeling



**Publication &
Subscription**

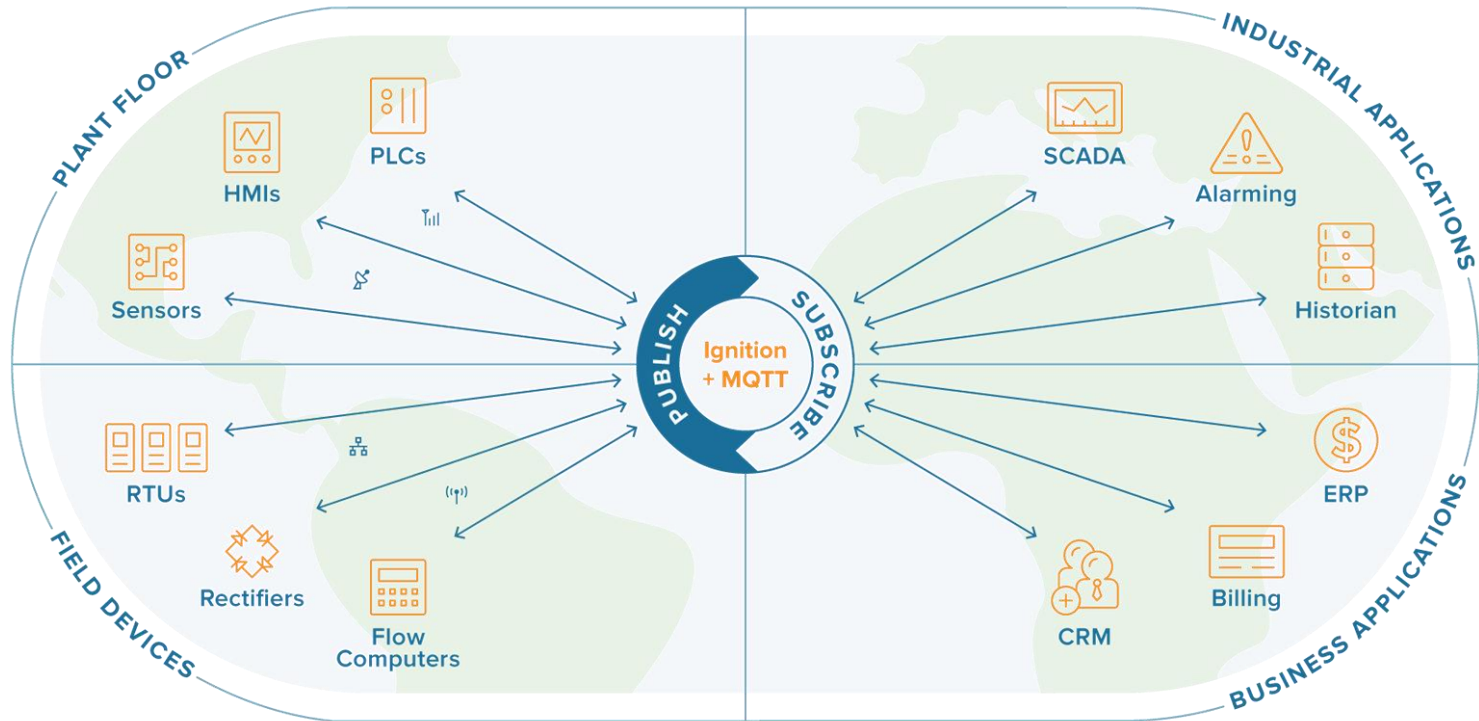


Industrial &
Business
Application



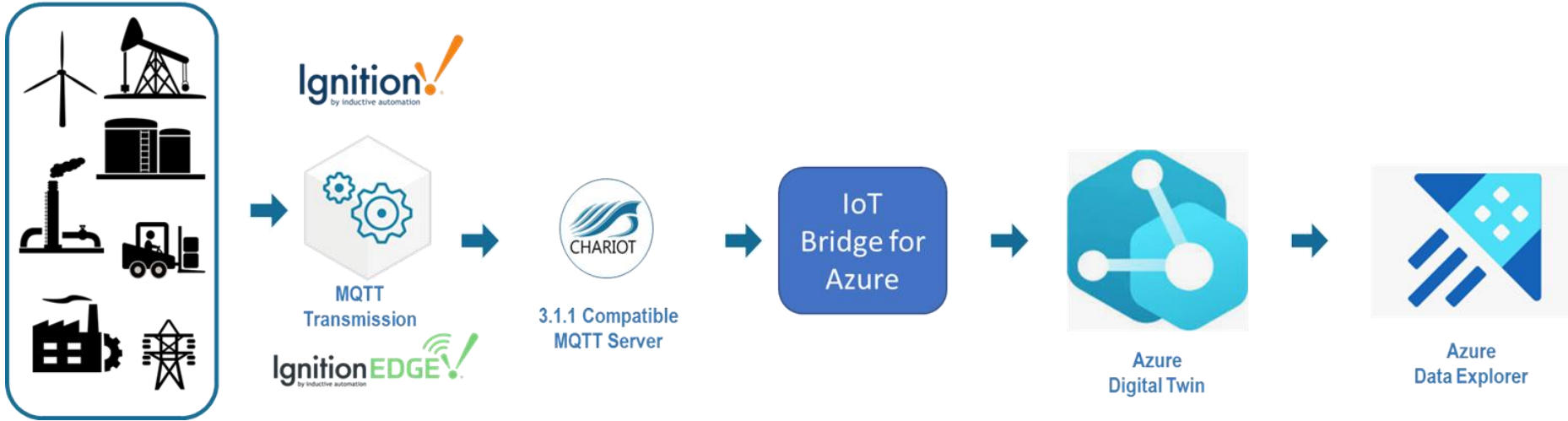
Analytics &
Machine Learning

Using Ignition for Digital Transformation: Publication & Subscription



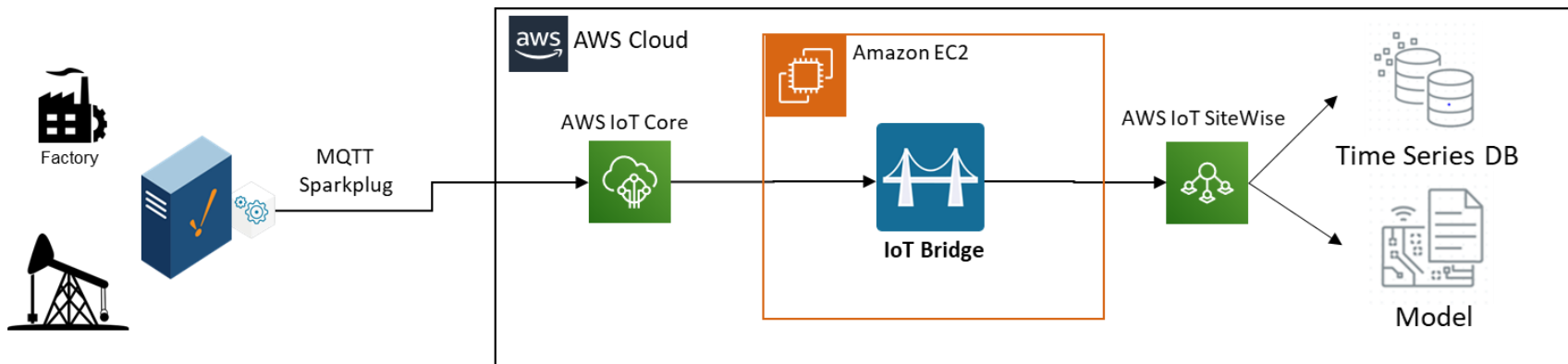
Cloud Connectivity - Azure

Operational Data



- Connect standard MQTT Sparkplug Models to Azure ADT & ADX
- No Code Required
- Automatic Discovery – Single Source of Truth

Cloud Connectivity - AWS



Ignition at the Edge

- Connect to OT Data
- Configure Machine Models as UDTs
- Instantiate UDTs to create Assets with Tags
- Convert Model/Asset/Tags to MQTT Sparkplug
- Connects to AWS IoT Core via MQTT
- **No Programming or Code Required**

IoT Bridge

- AWS Marketplace AMI
- Consumes MQTT Sparkplug messages
- Auto-Creates Data Models in AWS SiteWise
- Auto-Creates Assets from the SiteWise Models
- RBEs Real-Time Tag Data to AWS SiteWise
- **No Programming or Code Required**

AWS SiteWise

- Provide Standard Interface to Applications
- Provides Data Models for Assets
- Provides Time Series DB for OT data
- **No Programming or Code Required**

Ignition for Digital Transformation: Industrial & Business Applications



Collection



Data Modeling



Publication &
Subscription



**Industrial &
Business
Application**



Analytics &
Machine Learning

Business Applications

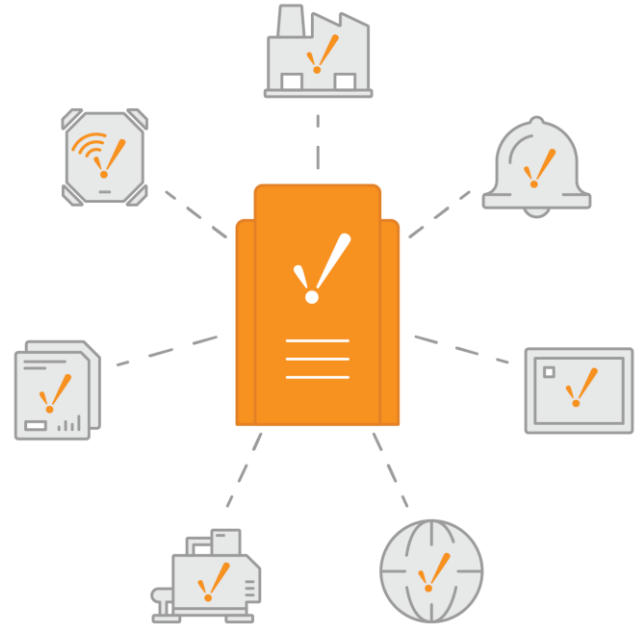
- Easily subscribe to data
- Connects to ERP, CRM, and More



Visualization: Build and Deploy Applications

One Universal Platform
for IIoT, SCADA and More

- Enterprise
- HMI
- MES
- Alarming
- Reporting
- Mobile



Visualization: Design Any Application

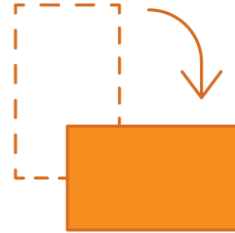
The Ignition Designer



Easy Drag-and-Drop Design



Rapidly Build and Customize Large Projects



Create Custom Graphics and Animations



Unlimited Designers Included

Ignition! Software Stack

by inductive automation

USER-CREATED APPLICATIONS



INDUCTIVE AUTOMATION MODULES

VISUALIZATION



DATA & LOGIC



ALARM & NOTIFICATION



CONNECTIVITY & ENTERPRISE



MQTT



CONNECTIVITY



DRIVERS

- EFM Emerson ROC
- Opto 22 groov Epic SNAP PAC
- ABB EFM TotalFlow

MES PARTNER MODULES

MES



CONNECTIVITY



IGNITION EDGE PRODUCTS

EDGE COMPUTING



PLATFORM



CONNECTIONS

- Tag System
- Database Connectivity
- OPC UA Connectivity
- OPC UA Server

CORE DRIVERS

- Modbus Driver
- UDP and TCP Driver
- BACnet Driver
- Siemens Driver Suite
- Allen-Bradley Driver Suite
- DNP3 Driver
- Omron Driver

SECURITY

- Authentication / Authorization
- ACLs - Access Control Lists
- Encryption

DEVELOPMENT

- Integrated Development Environment
- Module API
- Scripting

ENTERPRISE

- Store and Forward
- Redundancy

SYSTEM MONITORING

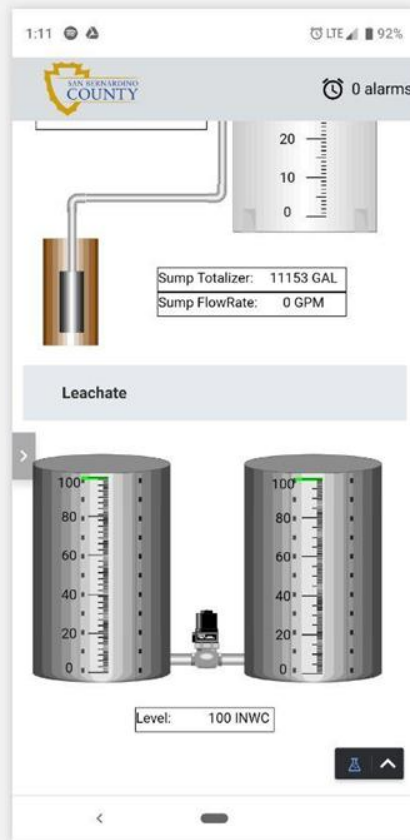
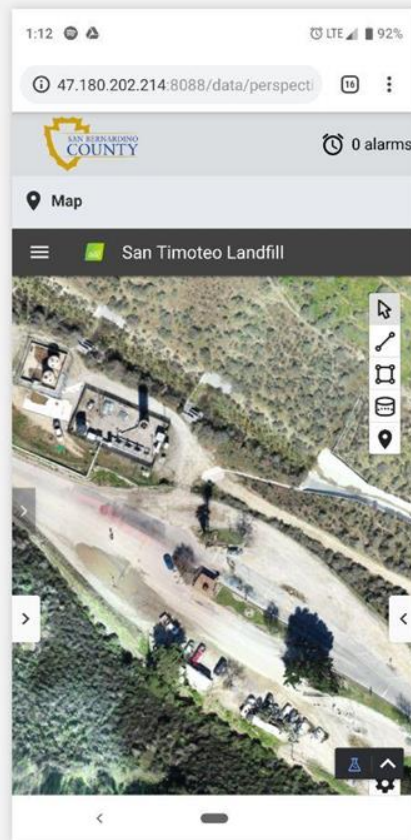
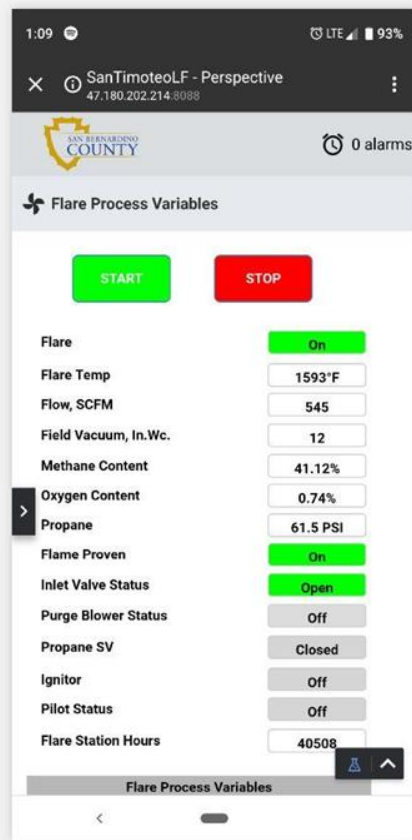
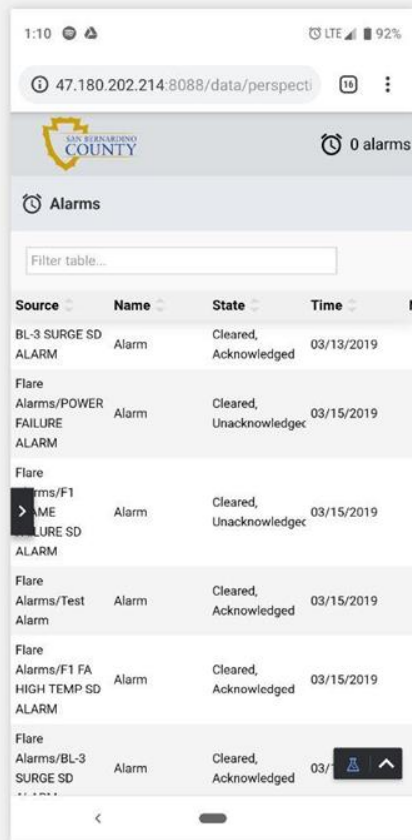
- Project Management
- Session Management
- Auditing
- System Status, Diagnostics & Logging
- Alarming Core

PLATFORM



OPERATING SYSTEM





Forming-540-0532 - OEE

Week of 05/03

OEE Availability Performance Quality

Overviews

OEE

Dashboards

Reports

Scope

Plant 1 >

Cutting >

Forming

Welding >

Machining >

Paint >

Assembly >

Forming-540-0532 X

Time Frame

☐ Day☒ Week☐ Custom

VO10127

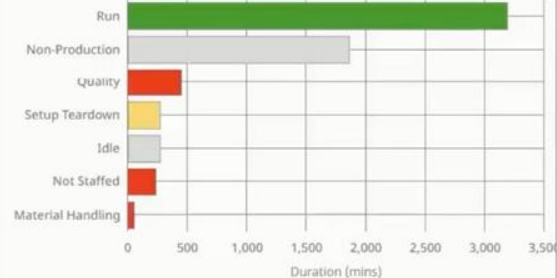
BRAKE 2 AMADA HG8025 Production - Not Staffed

Run Quantity
92Run Scrap
0Part Numbers
Production Runs
10
38MO
M03115
Part
05299300
Operation
0015
Operator
SARAH REZNICHEKPart Count
2,884
Std. Count
1,997Scrap
0Runtime
1,993.35
Downtime
412.833

Line Mode

Production 63.6%
Maintenance 1.4%
Idle 35.0%

Line States



Filter table...

Operator Name	Begin Time	End Time	Work Order	Product Code	Std. Rate (pcs/hr)	Parts Counted	Standard Count	Performance
PHILIP FISHER	05/02/2021 22:10:42	05/02/2021 23:53:06	M02783-0020	05299200-0020	0	76	64	118.75%
PHILIP FISHER	05/02/2021 23:55:54	05/03/2021 01:16:15	M04237-0015	05110700-0015		78	59	132.20%
PHILIP FISHER	05/03/2021 02:37:50	05/03/2021 03:49:36	M02883-0020	05287800-0020		78	85	91.76%
PHILIP FISHER	05/03/2021 03:52:44	05/03/2021 04:20:36	M04033-0020	05296200-0020		38	17	223.53%
SARAH REZNICHEK	05/03/2021 04:34:29	05/03/2021 05:38:59	M04033-0020	05296200-0020		50	24	208.33%
SARAH REZNICHEK	05/03/2021 07:57:30	05/03/2021 09:05:35	M02382-0015	04819400-0015		77	52	148.08%
SARAH REZNICHEK	05/03/2021 09:08:05	05/03/2021 10:41:47	M02783-0020	05299200-0020		58	36	161.11%
TAMMY KARNES	05/03/2021 18:44:39	05/03/2021 19:22:41	M03116-0030	05299400-0030		90	54	166.67%

25 rows

1 2

Material Handling - Main Window

AVERY DENNISON

Reporting

HMIs

Missions

Reporting

Warehouse

SAI

Warehouse

Warehouse User

Warehouse

Show Legs For

Sideloader Operator

CHECK AGV STATUS

REFRESH

Line	Mission	Cur Leg	Status	Since	Cur Loc	Dest Loc	Assignee	Resource	Lot	Spec	Lot Status
GS8	Whse to GS8	1	Queued		A05.01.4.			Manual	08C2211H260330	53057	GOOD
GF2	GF2 to Whse	2	Queued	9/1 12:34	C01.09.1.			Manual	02C2211J010043	78998	GOOD
Warehouse	Whse Transfer	1	Queued		72.0.0.			Manual	08C2211H310313	18558	GOOD

RUN MISSION

ABORT MISSION

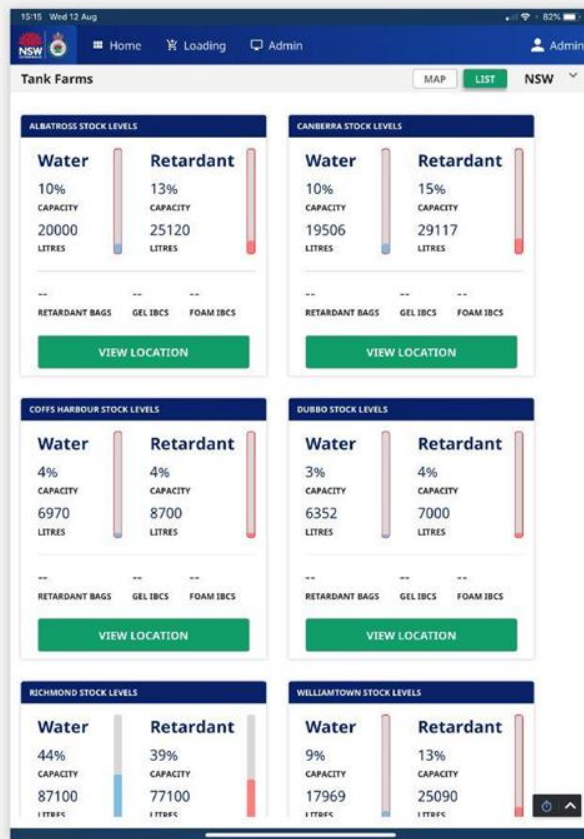
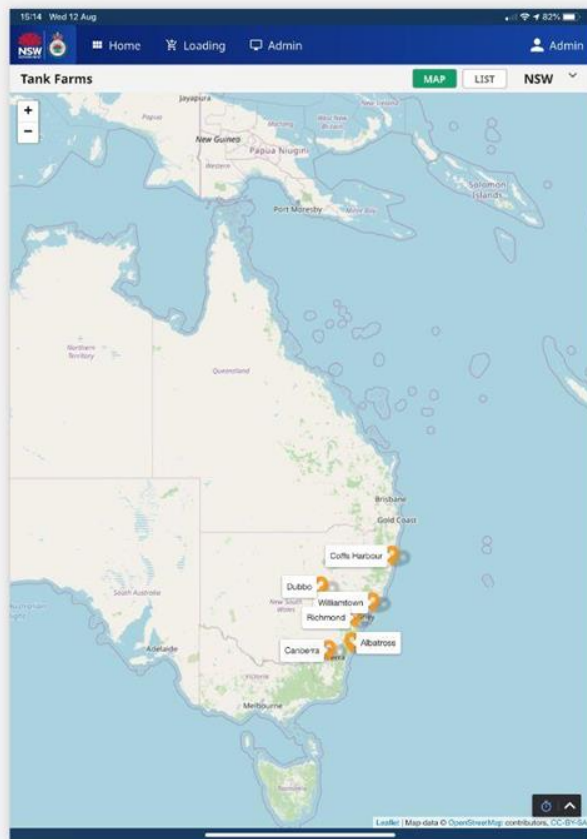
COMPLETE MISSION

NOT IN STOCK

SHOW MISSION DETAILS

CREATE MISSION

Sep 1, 2021 12:35:07 PM



15:16 Wed 12 Aug

NSW Home Loading Admin Admin

Load Request

Richmond

Select Aircraft: B210 B737

Select Base: Richmond

Dispatch Number: 333

Incident Name: Test

Incident Number: 321

Select Additive: Select...

Adjust load size (optional):

15,000 LITRES	33,000 POUNDS	3,900 US GALLONS

Aviation Fuel Required: ☒ No ☐ Yes

Comments (optional, 250 character limit):

Type comment here

OUTSTANDING LOAD CLEAR FORM

Using Ignition for Digital Transformation: Analytics & Machine Learning



Collection



Data Modeling



Publication &
Subscription



Industrial &
Business
Application



**Analytics &
Machine Learning**

Using Ignition for Digital Transformation: Analytics & Machine Learning

- Ignition has built-in data visualization tools and machine learning algorithms
- Ignition provides connections to use external systems.
- Ignition is open, empowering users to leverage best-of-breed tech
- Users can leverage external popular analytics and ML tools
- Closed Loop Control



Using Ignition for Digital Transformation: Analytics & Machine Learning

Machine Learning applications in Oil & Gas:

- Well optimization
- Artificial lift optimization & prediction
- Tank leak detection
- Decline curve analysis
- Pipeline corrosion
- Geographical features — and more



Using Ignition for Digital Transformation



Collection



Data Modeling



Publication &
Subscription



Industrial &
Business
Application



Analytics &
Machine Learning



Success Stories

Project for Avery Dennison

The Problem

- Avery Dennison expanded the production and warehousing capacity of its Greenfield, Indiana plant, including implementation of a new JBT AGV system to manage logistics movements.
- The new system needed to integrate with existing facility systems and processes as seamlessly as possible.
- The solution required sophisticated business logic to ensure materials went to the correct destination, coordinate with operators on human-operated vehicles and operators calling for materials, and report all material movement to the inventory tracking system.

Project for Avery Dennison

The Solution

- Flexware leveraged its a Ignition-based LIFT middleware framework as a solution accelerator.
- A new vehicle adapter interface for the JBT REST API was developed with the Web Dev Module and custom scripting, using the concept of an AGV “mission” to define source and destination locations.
- A mission triggering system provides workflow-like selection based on PLC tag values along with numerous screens to expand configurability and flexibility.
- A data interface communicates with Avery’s custom MES/Oracle ERP layer to manage schedule coordination and inventory tracking.



Reporting

Reporting

HMIs

Warehouse

SAI

Coaters

Missions

Coater GF1

Coater GF2

Coater GF3

Coater GF4

Ship As-is

GS1

GS10

GS2

GS3

< BACK

EDIT MISSION

MISSION ID: 1

INFORMATION

DETAILS

EDIT LEG

Leg Num:	Default Role:	Minutes:	Priority:	Role Resource Type:	AGV System:
1	AGV	7	81	AGV	AGV - JBT

Source Location

Assign Type:

Static Single Location

Location Zone:

Coater GF1

Location:

GF1 Unload

☐ Verify Inventory☒ Auto Start

Intermediate Location

AGV Mission Type:

Split

Location Zone:

Coater GF1

Location:

GF1 Decision Point

Destination Location

Assign Type:

Dynamic Zone Lookup

Location Zone:

Whse Staging GF1

Location:

<Select One>

CANCEL

SAVE

Destination

Unload Whse Staging GF1 : Dyn...

Lookup : Dynamic

SAVE



Reporting



Reporting

HMIs



Warehouse



SAI



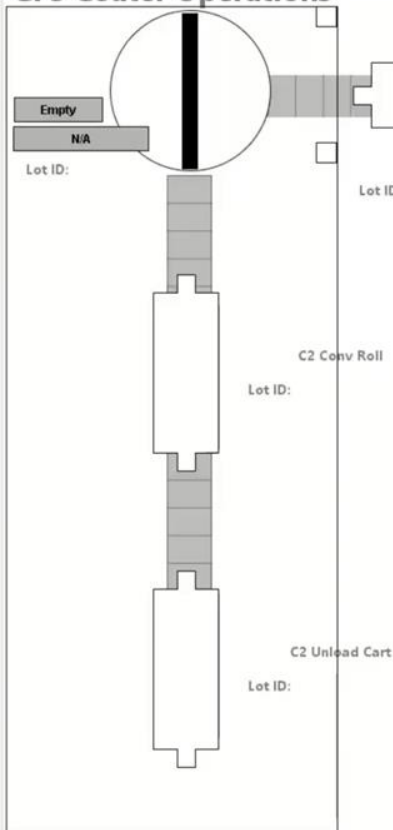
Coaters

Missions



Coater GF1

GF3 Coater Operations



Current User

Operator, GF1 - gf1

AGV System ON

Pickup Order Issued

382,779

Good

C4 Prep Stand

Lot ID:

C5 Conv Roll

Lot ID:

C6 Conv Roll

Lot ID:

C7 Conv Roll

Lot ID:

C8 Conv Roll

Lot ID: 02C3211J010067

☐ AGV Enter Req☒ AGV Clear☐ PLC OK to Enter☒ PLC Roll Present

GF3 Slabbing Stands

Slab 1 at B14.06.1

Role Present: No

Role Status: N/A

Slab 2 at B14.05.1

Role Present: No

Role Status: N/A

AGV #	Mission	Source	Destination
AGV 1	None		
AGV 2	None		
AGV 3	None		
AGV 4	None		
AGV 5	None		
AGV 6	None		
AGV 7	None		
AGV 8	None		

Project for Avery Dennison

The Result

- Flexware developed the solution over a six-month period, then partnering with Avery Dennison and JBT, successfully implemented the solution into the production environment.
- Avery Dennison achieved complete customer ownership of the solution, utilizing the full-featured configuration client to reconfigure existing missions as desired and add new equipment, vehicles, and missions to the system as needed.
- This integrated material handling solution has allowed Avery Dennison's Greenfield plant to significantly increase logistics capacity with minimal additional manpower.

Other Manufacturers Using Ignition



Atlas Copco



JMA Wireless



State of Indiana
New Energy
INsights program



JLG Industries



Qorvo

Other Manufacturers Using Ignition



Atlas Copco



JMA Wireless



State of Indiana
New Energy
INsights program



JLG Industries



Qorvo



Benefits of Ignition

What Makes Ignition Special

Different from every other Digital Transformation solution:

- Decouples intelligent devices from applications
- IIoT built from the ground up
- Build and deploy robust applications



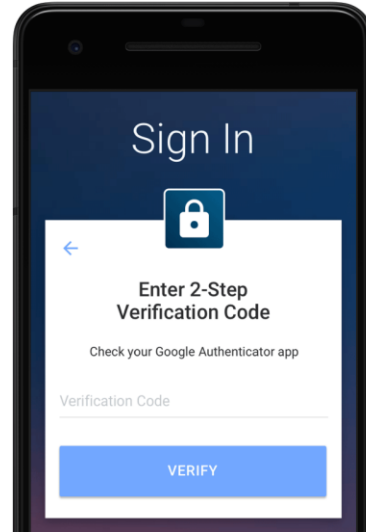
Focus on Security

Ignition:

- Supports industry-leading encryption protocols
- Compatible with federated identity infrastructure
- Supports multi-factor authentication
- Role-based security, data governance

Inductive Automation:

- Secure development processes
- Integrated code scanning and monitoring
- Strong focus on a culture of security



PingID

okta



ADFS

Online Training & Certification

- Watch hundreds of free videos on-demand
- Sign up for free at: inductiveuniversity.com
- Earn your Ignition certification



INDUCTIVE
UNIVERSITY

Digital Transformation Starts with Ignition

- Connect Processes, People, and Programs
- Solve data problems
- Access more OT data and bring it together with IT data
- Data collection, data modeling, publication and subscription, industrial and business applications, analytics, and machine learning
- Connect to an ecosystem of other solutions including software, hardware, and services





Ready to Try Ignition for Yourself?

Download the full version for free at:
[inductiveautomation.com](https://www.inductiveautomation.com)

ICC

XPERIENCE & XPLORE

In Person: Sept. 20-21, 2022 | Virtual: Oct. 3-5, 2022

Register at: icc.inductiveautomation.com

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South Africa	Element8	https://element8.co.za
Switzerland	MPI Technologies	https://mpi.ch

Contact International Distribution Manager Annie Wise at: awise@inductiveautomation.com

Questions & Comments

Today's Guest

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Eric Hollering

eric.hollering@flexwareinnovation.com



Call us at: **800-266-7798**

Email us at: **sales@ia.io**



**Melanie
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Director of Sales
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**Jim
Meisler**

x227



**Ramin
Rofagha**

x251



**Lester
Ares**

x214



**Vannessa
Garcia**

x231



**Shane
Miller**

x218



**Maria
Chinappi**

x264



**Myron
Hoertling**

x224



**Robert
Graves**

x142



**DJ
Parsons**

x150



**Roman
Couvrette**

x163



**Abran
Mathews**

x151



**Justin
Reis**

x186

Thank You

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