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# THE CONNECTED FACTORY PLAYBOOK

Actionable Insights for C-Level Manufacturing Leaders

*Presented by IIoT World*

Featuring Experts from Cirrus Link, HighByte, and Snowflake

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## Executive Summary

The next era of industrial manufacturing hinges not on more data but on the right data, made actionable in real-time. In a landscape where up to 95% of factory data remains unused, leading manufacturers are shifting focus from equipment upgrades to data unification, AI readiness, and contextual visibility.

This playbook, built on insights from experts at **Cirrus Link, HighByte, and Snowflake**, delivers a strategic blueprint for manufacturers navigating the convergence of OT, IT, and AI. It breaks down complex concepts, such as unified namespace (UNS), Industrial DataOps, digital twins, and cloud-native infrastructure, into clear, actionable priorities tailored for C-level decision-makers.



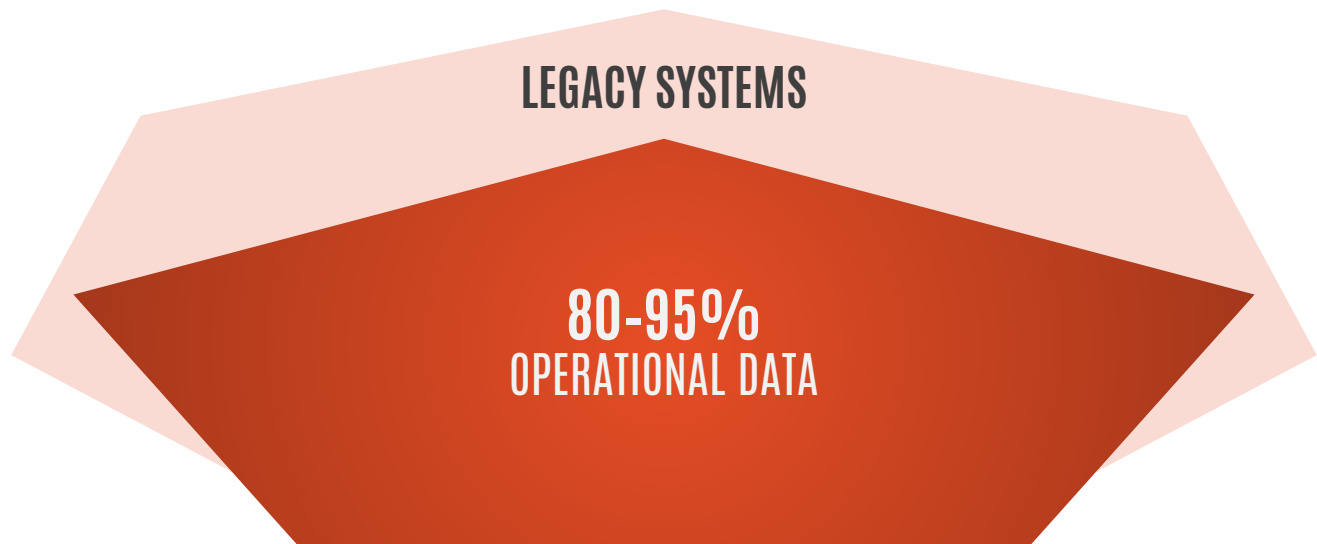
## Introduction: Why This Playbook Matters Now

Manufacturers are under pressure to innovate more quickly, reduce waste, improve uptime, and respond to disruptive forces with greater agility. Yet despite decades of digital transformation talk, most operational data remains siloed, unstructured, or simply invisible beyond the plant floor.

The Connected Factory isn't a vision of tomorrow—it's a mandate for today. Whether your company is battling data sprawl, exploring AI, or seeking to bridge IT and OT systems, the insights shared here provide a rare strategic lens into how leading organizations are transforming operations using real-time data pipelines, UNS architecture, and AI-enhanced decision-making.

## The Data Dilemma: Factories Are Drowning, Not Starving

80–95% of valuable operational data remains stranded in legacy systems across the factory floor — unused, misunderstood, or invisible, as noted by Arlen Nipper, CTO of Cirrus Link, during IIoT World Manufacturing Day in May 2025.



### LEGACY BLIND SPOTS:

Factories continue to operate with 30–40-year-old equipment, often lacking access to comprehensive data.

### SILO TRAP:

OT and IT data remain disconnected, with only a limited amount of shared context.

### DATA SWAMP WARNING:

Unorganized cloud migration without context turns data lakes into dead zones.

**C-LEVEL PRIORITY: DO NOT “COLLECT EVERYTHING, SORT IT LATER.”**

Begin with business problems, then map targeted data strategies.



## Unified Namespace (UNS): The Strategic Backbone of the Smart Factory

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*"The UNS doesn't invent new data — it liberates what you already have."*

**Arlen Nipper,**  
**CTO and President, Cirrus Link Solutions**

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*"UNS allows organizations to preserve existing systems while enabling consistent, real-time access for downstream teams — from analysts to AI models. That's the game-changer."*

**Jeffrey Schroeder,**  
**Product Manager, HighByte**

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## WHY UNS MATTERS:

Unifies OT, IT, IoT, and AI data under a logically organized, semantically consistent framework.

Supports real-time and historical access from edge to enterprise.

Reduces engineering duplication, version drift, and data misinterpretation.

## ADOPTION INSIGHTS:

MQTT + Sparkplug enables real-time asset modeling from edge to cloud.

Use cases are booming across the life sciences, automotive, energy, and consumer goods sectors.

Supports both publish/subscribe and API-based access for varied consumption models.

## C-LEVEL PRIORITY:

Invest in UNS as a data product, not just a pipe.  
Empower DataOps teams to manage it as a strategic asset.

## Cloud: It's Not Just About Storage — It's an Innovation Engine

**“CLOUD IS NOT THE GOAL – BUSINESS OUTCOMES ARE.”**

Tim Long, Global Head of Manufacturing, Snowflake

### CLOUD'S EVOLVING ROLE:

Hybrid model: Real-time, latency-sensitive tasks stay on-prem; analytics, AI, and integration move to the cloud.

Elasticity: Essential for ML training, burst processing, and rapid scaling.

Cross-functional insight: Connect ERP, MES, and edge data for end-to-end visibility.

### KEY CLOUD FEATURES TO PRIORITIZE:

Security & Governance (IP protection is non-negotiable)

Real-time & batch data support

Native AI/ML and advanced analytics

### C-LEVEL PRIORITY:

Choose cloud platforms that scale intelligently and support full data diversity, including images, video, and time-series data.




## Digital Twins: From Equipment to Entire Organizations



*"Digital twins are not just for assets — they're models of processes, systems, and even enterprises."*

**Rick Franzosa,**  
**Moderator, IIoT World**

### REAL-WORLD VALUE:

-  Predictive maintenance with edge-to-cloud sensor data
-  Simulations to test process changes before physical implementation
-  Process optimization by combining IT + OT context

### C-LEVEL PRIORITY:

View digital twins not as tech features but as drivers of performance modeling, cost avoidance, and time-to-market reduction.

## AI & Machine Learning: Moving from Insight to Autonomy



*"You cannot have an AI strategy without a data strategy."*

**Tim Long,**  
**Global Head of Manufacturing, Snowflake**

### WHERE AI DELIVERS IMMEDIATE ROI:



- ➔ Natural language interfaces (chatbots for factory queries)
- ➔ Defect detection with computer vision (e.g., sorting tomatoes or wheat)
- ➔ Predictive analytics for downtime, quality issues, or energy consumption
- ➔ Part substitution & supply chain optimization using LLMs

### CHALLENGES:



- ➔ Dashboards break down at scale — AI scales insight beyond static views.
- ➔ Requires clean, well-contextualized data from UNS to be effective.
- ➔ Organizational change management is as critical as technology adoption.

### C-LEVEL PRIORITY:

Focus AI efforts where business KPIs are clearly impacted.  
Don't start with the tech — start with the outcome.



## Organizational Readiness: Your Bottleneck Isn't Tech — It's People and Process



### KEY BLOCKERS:

- ▶ Misaligned teams (OT, IT, data scientists not collaborating)
- ▶ Machine builders withholding access to device data
- ▶ Lack of documented schemas, register maps, or data models
- ▶ Spreadsheet-driven culture masking hidden manual effort



### WINNING STRATEGIES:

- ▶ Build cross-functional data teams (data producers + consumers)
- ▶ Treat data access and semantic modeling as core skills
- ▶ Mandate openness from equipment vendors in contracts

### C-LEVEL PRIORITY:

Culture change > Tool change. Upskill teams. Align incentives.  
Mandate transparency across the supply chain.

## Final Thought:

The future of smart manufacturing isn't defined by sensors or cloud platforms alone—it's defined by how well organizations organize, contextualize, and activate their data. Unified Namespace isn't just a technical pattern—it's a business enabler. Cloud isn't just a storage solution—it's a decision engine. AI isn't just a buzzword—it's a multiplier for human capability.

C-level leaders must now think beyond CapEx and uptime metrics. They must:

Demand data transparency from suppliers and machine builders

Build cross-functional teams fluent in both domain and data

Treat data pipelines and models as first-class products

Anchor AI investments in clear business outcomes

Those who act now—decisively and strategically—will not only outcompete but reshape how modern manufacturing defines productivity, agility, and innovation.

The tools are here. The strategy is clear. The competitive edge starts at the data layer.

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