inflexion point

E-BOOK · INDUSTRIAL DATA ARCHITECTURE

The Unified Namespace is not the destination

Why CESMII's push toward information models and interoperability is the right direction for industrial data, and where the industry needs to take it next.

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01 · THE SHIFT

Moving beyond connectivity

For the past few years, much of the industrial data conversation has centered on the Unified Namespace (UNS). Too often, it has been reduced to a simple formula: stand up an MQTT broker, organize tags into a hierarchy, and call it a data architecture.

CESMII, the Smart Manufacturing Institute, is moving the industry past that idea. Its work on Smart Manufacturing (SM) Profiles, its interoperability architecture, and the i3X interface puts the emphasis where it belongs: information modeling, reusable data structures, relationships, contextualization, and interoperability.

We support that direction. It aligns closely with the data-centric architecture we have been advocating at InflexionPoint. There are important distinctions, and real opportunities to extend CESMII's approach, but the momentum matters. A growing group of vendors is engaging with this model, and that is a very positive sign for manufacturers.

THE CORE POINT

The UNS is a useful mechanism for accessing and distributing industrial information. It should not be confused with the information architecture itself.

Three concepts behind CESMII's architecture

CESMII's approach rests on three building blocks.

01

SM Profiles

Standardized, reusable information models that define manufacturing objects, their properties, and their relationships. In practice, they establish data contracts between systems.

02

Smart Manufacturing Interoperability Platforms (SMIPs)

Platforms that instantiate those models, maintain contextual relationships, and use knowledge graphs. This is where the next generation of industrial architecture is taking shape, and where vendors are listening and buying in.

03

i3X

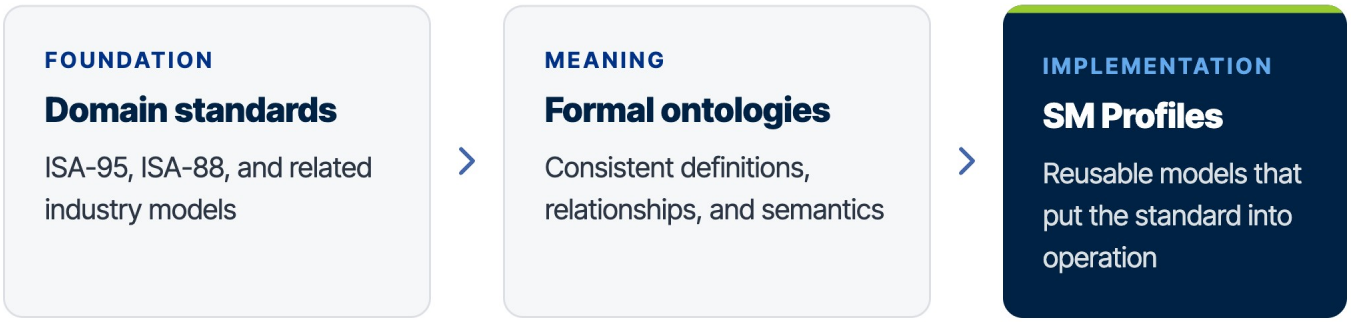
A vendor-neutral interface that lets applications discover, query, and consume contextualized manufacturing information. It is not transactional, so its scope is deliberately limited, but it is fit for purpose.

Together, these represent a significant advance over traditional point-to-point integration, and even over broker-centric UNS implementations. Just as important, CESMII recognizes the value of knowledge graphs and semantic relationships.

03 · OUR POSITION

Grounding information models in industry standards

At InflexionPoint, we advocate a standards-based, ontology-driven, data-centric architecture. Industrial information should be grounded in recognized domain standards such as ISA-95 and ISA-88, along with related industry models. Formal ontologies then provide consistent definitions, relationships, and semantics across applications and across enterprises.



How it should work: each SM Profile is the operational implementation of an authoritative, standards-based semantic model.

SM Profiles offer a practical way to implement reusable information models. The risk is that profiles end up independently redefining concepts that industry standards have already established. Ideally, an SM Profile should be the operational implementation of an authoritative, standards-based semantic model.

That discipline matters because this space is crowded. Competing and overlapping approaches, such as the Asset Administration Shell (AAS) and Module Type Package (MTP), are all vying for adoption. Anchoring profiles in established standards keeps them interoperable as the landscape evolves.

Why the distinction matters

Information modeling and ontology-based modeling do different jobs. Scalable interoperability requires both.

INFORMATION MODELING

Describes the structure of data

Objects, properties, and how data is organized, so systems can exchange it consistently.

ONTOLOGY-BASED MODELING

Establishes shared meaning

Relationships and constraints, so every system and team interprets that data the same way.

That becomes critical when you connect systems across the operation:

Manufacturing · Maintenance · Quality · Materials · Laboratory · Enterprise applications

ESPECIALLY FOR AI

Models trained or prompted on data that lacks shared meaning will produce answers that do not hold up across sites, systems, or teams.

05 · THE WAY FORWARD

The foundation that makes the UNS valuable

The Unified Namespace is one component of a broader, standards-based, data-centric architecture.

01	**Information models**	make industrial data usable
02	**Ontologies**	establish shared meaning
03	**Governance**	makes that meaning sustainable
04	**Interoperability platforms**	make the information accessible

UNS One access and distribution mechanism within this architecture, not the architecture itself.

CESMII is helping the industry mature from connectivity toward meaningful interoperability. We support that direction, and our experience with ISA standards, industrial information modeling, knowledge graphs, and OT/IT integration positions us to help manufacturers implement these concepts and extend them.

Any capable integrator can implement a UNS. The harder and more valuable work is architecting and governing the industrial information foundation that makes the UNS, analytics, AI, and enterprise interoperability pay off. That foundation is not a one-time project. It has to be maintained and improved as plants, systems, and standards change, which is why we approach it as an Operating Partner rather than a project vendor.

YOUR OPERATING PARTNER

Planning a UNS, data platform, or AI initiative?

Talk with our team about building an information architecture that will scale with it.

Talk with our team

ABOUT INFLEXIONPOINT

We design, build, and manage OT systems for regulated, uptime-critical operations, then stay after go-live as your Operating Partner. Most integrators ask "Who can build this?" We ask "Who will stand behind it?"

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