INDUSTRIAL INFORMATION INTEROPERABILITY EXCHANGE FROM CESMII

Positioning Statement

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Industrial Information Interoperability eXchange (i3X)

Background/Problem and Solution

The **Industrial Information Interoperability Exchange (i3X)** is an open, standard API initiative proposed to address a growing interoperability challenge in modern manufacturing architectures: **Manufacturing Data Silo Proliferation and API chaos**. As manufacturers adopt heterogeneous software stacks from multiple vendors, the industry risks repeating past fragmentation seen with protocols, stovepipe architectures and namespaces – this time at the API layer.

i3X provides a **vendor-agnostic, standard interface** for interacting with manufacturing information platforms, enabling scalable AI-ready interoperability without locking organizations into proprietary platforms and APIs.

Primary Message

Manufacturing Interoperability

This API initiative is an international effort to establish a common, vendor-agnostic API for contextualized manufacturing information, solving the longstanding problem that manufacturing app developers must build against incompatible, proprietary platform interfaces (historians, MES, MOM systems), severely limiting application portability and innovation.

By defining a standardized set of graph-aware, cloud-agnostic server primitives that any platform can implement, this effort aims to do for industrial manufacturing what Apple and Android did for mobile: create a unified interface contract that enables a vibrant ecosystem of portable applications—analytics, visualization, ML/AI tools—that can run across any compliant platform, ultimately benefiting end-users through greater choice, faster innovation, and reduced vendor lock-in while still allowing platform vendors to differentiate on capabilities.

Key Principles

Open

i3X proposes a **single, open, standard API** that any manufacturing information platform can implement, regardless of vendor or underlying technology. Rather than forcing data to be re-wired through brokers or custom middleware, i3X standardizes *how applications interact with information platforms themselves*.

Key principles:

- **Vendor-neutral**: Works on top of any information layer
- **Composable**: Supports single-vendor or multi-vendor architectures
- **Opinionated but minimal**: Defines essential capabilities every rich information platform must expose

Core Capabilities

An information platform implementing i3X must support a common set of primitive operations, including the ability to:

- Discover available **namespaces**
- Explore **object types (classes)** and their definitions
- Retrieve **instances** of those object types
- Navigate **hierarchical and non-hierarchical relationships**
- Query **current (real-time) values**
- Query **historical values**
- **Update** current and historical data (where permitted)
- **Subscribe** to changes and events

These primitives form the foundation for advanced manufacturing use cases, analytics, and AI applications.

Strategic Value

i3X brings together the best of OT and IT, enabling the use of modern software development methodologies against OT data and facilitating the standardization, portability and reusability of manufacturing architectures and solutions.

For manufacturers and solution providers, i3X will:

- **Reduce** the **cost** and **complexity** of Smart Manufacturing systems acquisition, implementation and sustaining
- Enable **standardization** of **manufacturing data** – for both existing and new implementations
- Bring **modern software development** practices to OT
- **Empower** 1.5 million **IT** analysts, developers and practitioners to create value from manufacturing systems
- **Enable AI** at scale
- Facilitate the **formation** of a Smart Manufacturing **App development ecosystem** building solutions against a common API (not proprietary infrastructure)

i3X establishes a common, open API layer for manufacturing information platforms, ensuring that as architectures become more heterogeneous, interoperability becomes simpler—not harder. It is a critical enabler for scalable, future-proof, AI-ready and OT-IT compliant manufacturing systems.