Global Dialogue on Seafood Traceability (GDST)

BEYOND TRANSACTIONS
Building Traceable Supply Chains With EPCIS

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GLOBAL DIALOGUE
on Seafood Traceability

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Building trust in supply chains

Global retailers and supply chains face mounting pressure from regulators and customers to demonstrate their products are safe, ethical and sustainable[1] . In today's market, gaining a critical edge in building consumer confidence and delivering compliance with legislation requires systems that deliver **digital interoperable traceability** - enabling data to pass seamlessly along the full length of the supply chain.

The Global Dialogue on Seafood Traceability (GDST) is leading the way for companies seeking to build trust in their supply chains, enabling a common-language through its GDST Standard and the development of comprehensive digital interoperable traceability solutions.

Whilst seafood sector leaders working with GDST are at the forefront of the **traceability revolution**, there are key steps many retailers and supply chains still need to take to realise their fish-to-fork traceability ambitions. A foundational step is the adoption of **event-based data sharing systems** that can support digital interoperable traceability. This document outlines how existing Electronic Data Interchange (EDI) solutions fall short delivering on current market and regulatory demands for traceability and explores the value to retailers and supply chains of investing in event-based data sharing systems.

[1] **IBM 2024 Consumer Study: Revolutionize retail with AI everywhere**

The growing need for supply chains to deliver end-to-end digital traceability

To meet the growing demand for digital interoperable traceability, many companies have attempted to adapt their existing EDI solutions. However, EDI was not designed for this purpose and it has several design limitations that prevent it from being an effective comprehensive traceability solution. To future-proof traceability investments and meet emerging expectations, forward-thinking companies are adopting **event-based data sharing approaches** — that utilize **GS1's Electronic Product Code Information Services (EPCIS) standard** — to complement their existing transactional systems and enable digital interoperable traceability.

▶ EDI: An essential tool for Transactional Data Exchange

First developed in the 1970's, EDI was designed to streamline the process of ordering, shipping, invoicing, and payment by standardizing commercial data exchange. It is a point-to-point communication protocol for transmitting structured data typically recorded on documents such as:

- **Purchase orders**

- **Invoices**

- **Advance shipping notices (ASNs)**

- **Shipping documents**

- **Order acknowledgments**

Key limitations of EDI for today's business needs

- **Designed for transactions, not traceability**
  EDI messages capture business transactions, but not event-based product movement. This leaves major gaps in traceability, such as transformations, handling steps, and product state changes.

- **Limited visibility across supply chains**
  EDI exchanges are typically bilateral (point-to-point), limiting the ability to create a seamless view of product movement across multi-tier, multi-party supply chains.

- **Rigid and complex to adapt**
  EDI standards are difficult to extend for new traceability use cases (e.g., sustainability claims, catch certificates, recall readiness). New data requirements often require costly, partner-specific customizations.

- **No standard approach to unique identification**
  EDI implementations vary in how products and batches are identified. Without consistent use of globally unique identifiers (like Global Trade Item Numbers or 'GTINs', serial numbers, lot codes), reliable traceability is impossible.

- **Not optimized for modern interoperability**
  EDI was built before Application Programming Interface (API)-first, cloud-based, and event-driven architectures became the norm. It struggles to integrate with modern digital systems and consumer transparency platforms.

- **No single globally accepted standard**
  EDI represents a concept that has been embodied by several different standards, none of which have been globally accepted.

Why EPCIS is the right foundation for traceability

EPCIS (Electronic Product Code Information Services) provides a purpose-built framework to share traceability data across supply chains. It focuses not on transactions, but on capturing and sharing "what happened" to products as they move through the supply chain.

- **Event-based traceability**
  EPCIS captures key business events (e.g., pack, ship, receive, transform), including where, when, and what happened to each item or batch.

- **Standards-based interoperability**
  EPCIS leverages global GS1 standards for product and location identifiers, enabling true interoperability across different systems and trading partners.

- **End-to-end visibility**
  EPCIS supports network-wide visibility, not just point-to-point exchanges, allowing stakeholders to build a complete product journey across the supply chain.

- **Extensibility**
  EPCIS is built to be extended—supporting additional data such as sustainability claims, regulatory attributes, and more—without fragmenting the core standard.

- **Modern architecture ready**
  EPCIS 2.0 supports JSON/REST APIs, enabling seamless integration with modern IT infrastructures, cloud platforms, and digital transparency tools.

COMPARING EDI AND EPCIS SYSTEMS SUITABILITY AS INTEROPERABLE TRACEABILITY SOLUTIONS

CAPABILITY	EDI	EPCIS
PRIMARY PURPOSE	Exchanging business transactions (orders, invoices, shipping notices)	Capturing and sharing event-based traceability data
DATA MODEL	Document-based (transaction-focused)	Event-based (what happened to products)
LEVEL OF GRANULARITY	Typically, shipment- or batch-level	Item-, batch-, or event-level
VISIBILITY SCOPE	Point-to-point (direct trading partners)	End-to-end (multi-tier supply chains)
TRACKING PRODUCT TRANSFORMATIONS (E.G., PROCESSING STEPS)	Limited	Purpose-built for this
TRACKING AGGREGATION / DISAGGREGATION OF PRODUCTS	Limited	Purpose-built for this
USE OF GLOBAL IDENTIFIERS (E.G., GTIN, LOT, UVI)	Possible, but not always consistent	Central to the data model
BUSINESS TRANSACTION LINKAGE	Core function	Referenced in events, but not core function
INTEGRATION WITH MODERN IT ARCHITECTURES (APIS, CLOUD)	More difficult; traditionally file-based	Designed for modern, API-based integration
EXTENSIBILITY FOR SUSTAINABILITY, REGULATORY, AND BRAND CLAIMS	Requires custom extensions	Supported through standard extension mechanisms

EPCIS in seafood:

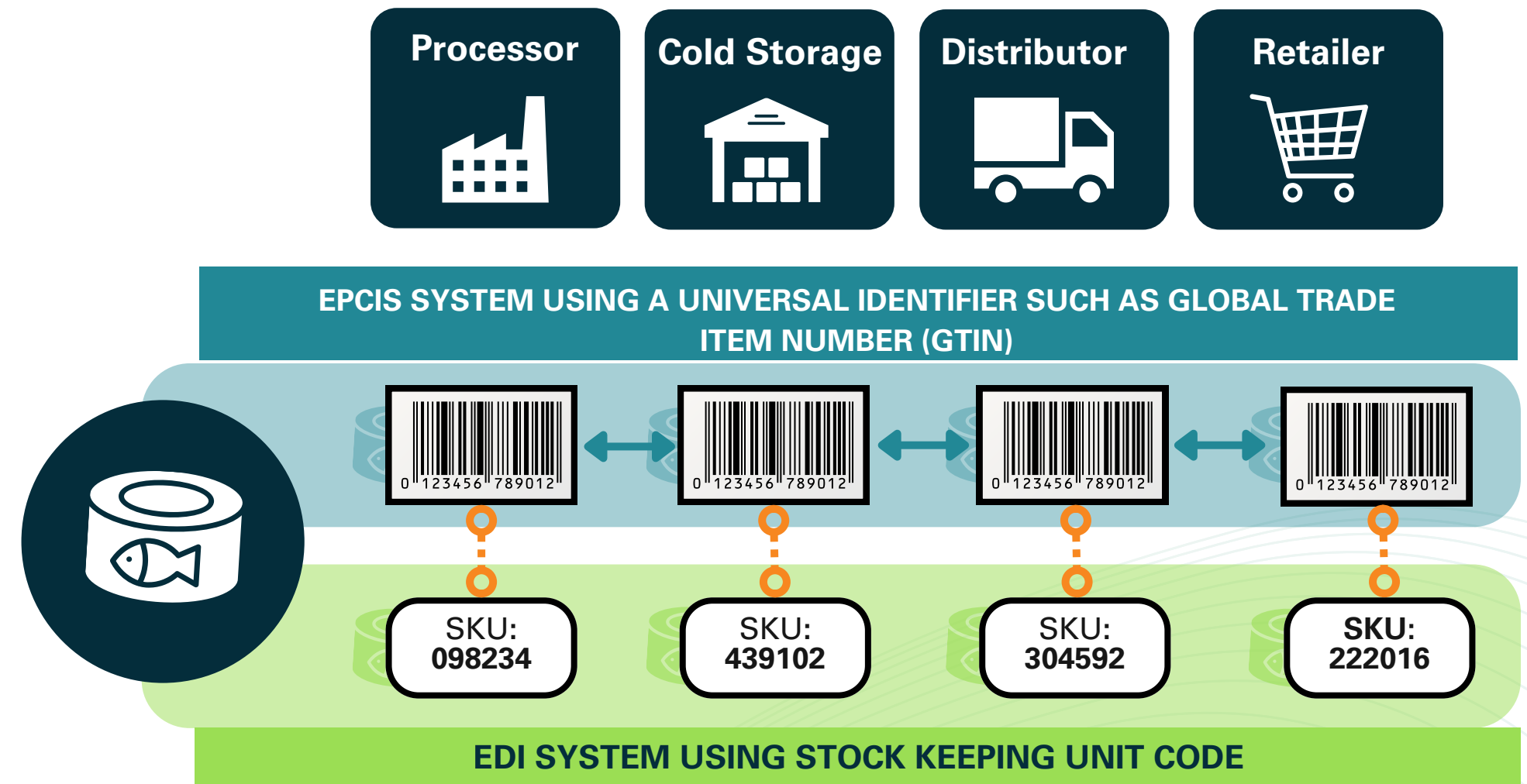Seafood supply chains are increasingly under pressure to deliver digital interoperable traceability, driven by:

✓ Regulations e.g., US Seafood Import Monitoring Program (SIMP), EU Illegal, Unreported, and Unregulated Seafood Regulations (EU IUU), US Food Safety Modernization Action Section 204 (FSMA 204), Japan import rules)

✓ Market access requirements from global retailers who are responding to consumer demands for greater transparency

✓ Sustainability and ethical sourcing initiatives growing in number as environmental campaigning groups and consumer purpose-driven purchasing drives growth in standards and certification schemes

EDI today:

Many seafood exporters and importers already use EDI for transactional data — purchase orders, invoices, ASNs — particularly with large retailers and distributors. However, EDI does not capture physical product movement or transformations (e.g., whole fish → fillets → frozen portions), which are essential for:

✓ Demonstrating legal origin (required by Food and Agriculture Organization regulations)

✓ Supporting batch-level recalls and risk management

BUILDING TRACEABLE SUPPLY CHAINS WITH EPCIS

Processor **Cold Storage** **Distributor** **Retailer**

EPCIS SYSTEM USING A UNIVERSAL IDENTIFIER SUCH AS GLOBAL TRADE ITEM NUMBER (GTIN)

0 123456 789012   0 123456 789012   0 123456 789012   0 123456 789012

SKU: 098234   SKU: 439102   SKU: 304592   SKU: 222016

EDI SYSTEM USING STOCK KEEPING UNIT CODE

↔ The use of a single GTIN code attached to a seafood product means it can be tracked across the supply chain, with data available for a supply chain actor to pull from every other part of the chain.

○–○ Internal product codes in EDI systems like Stock Keeping Unit codes are unique to each supply chain actor.
Modules can be used to used to support integration with traceability solutions.

EPCIS in use:

- GDST (Global Dialogue on Seafood Traceability) has adopted EPCIS as the core technical standard for interoperable seafood traceability.

- Leading seafood brands, processors, and solution providers are implementing EPCIS to:

  • Share key traceability events (harvest, landing, processing, shipping)

  • Enable cross-system interoperability (from farm and fishing vessel to processors and retailers)

  • Support compliance with import regulations and corporate transparency goals

- EPCIS allows data to flow across the entire chain, even when multiple software systems are involved.

While EDI supports basic transactions, it cannot provide the item/batch-level chain of custody that modern seafood compliance and market expectations now require. EPCIS fills this gap.

Recommendation

As regulatory demands, consumer expectations, and industry needs evolve, supply chains must move beyond the constraints of EDI when it comes to traceability.

While EDI remains a reliable tool for executing routine business transactions, EPCIS is the clear path forward for building a future-proof, interoperable, and extensible traceability foundation. Organizations investing in traceability today should prioritize EPCIS-based architectures to avoid costly rework and ensure long-term value from their digital supply chain initiatives.

▶ ## Next steps

- For an overview of the EPCIS data sharing standard visit **https://www.gs1.org/standards/epcis**

- To understand how interoperable digital traceability can benefit your organization visit **https://thegdst.org/wp-content/uploads/2024/05/Event-Based-Traceability.pdf**

- To find out more about the GDST Standard and how GDST can support your organization visit **https://thegdst.org/resources/**

- Still have questions? Contact us at **info@thegdst.org**

CONTACT

If you have any questions, please reach out to us at **info@thegdst.org**

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