

FROM CUSTOM DEVELOPMENT TO SIMPLE CONFIGURATION: THE AQUA EXCHANGE CASE STUDY

How Aqua Exchange achieved GDST Capability Test readiness using the Traceability Driver – without direct implementation support and without changing their existing system.



BACKGROUND: GDST, CAPABILITY TEST, AND THE TRACEABILITY DRIVER

The Global Dialogue on Seafood Traceability (GDST) establishes a common framework for interoperable seafood traceability based on standardized data formats and event-based traceability. To help technology solution providers demonstrate that their systems can generate and exchange GDST-compliant traceability data, GDST developed the GDST Capability Test, which verifies whether a system can produce standardized traceability events, master data, and digital link information in the correct structure and format to ensure interoperability.

To support technology solution providers in meeting these requirements, the Institute of Food Technologists (IFT), through the Global Food Traceability Center (GFTC), developed the open-source Traceability Driver. The Traceability Driver allows solution providers to use their existing systems, map their data to the GDST framework, and generate the standardized data needed to pass the GDST Capability Test and share traceability data with other systems. The Traceability Driver is installed and run by the solution provider on their own system, meaning companies always retain full control over their data and decide when and with whom data is shared.

The following case study describes how Aqua Exchange implemented the Traceability Driver using their existing system architecture in order to pass the GDST's Capability Test.

Aqua Exchange summarized their experience as follows:

"At Aqua Exchange, we knew that meeting global traceability standards was the right step, but we also needed a path that worked with our existing system — not against it. The Traceability Driver gave us exactly that. Within just one to two weeks, we went from integration uncertainty to full GDST Capability Test readiness. What could have taken months of custom development was reduced to a focused mapping exercise. For any technology provider looking to achieve interoperability without rebuilding from scratch, the Traceability Driver is a genuinely practical solution."

— Aqua Exchange Team

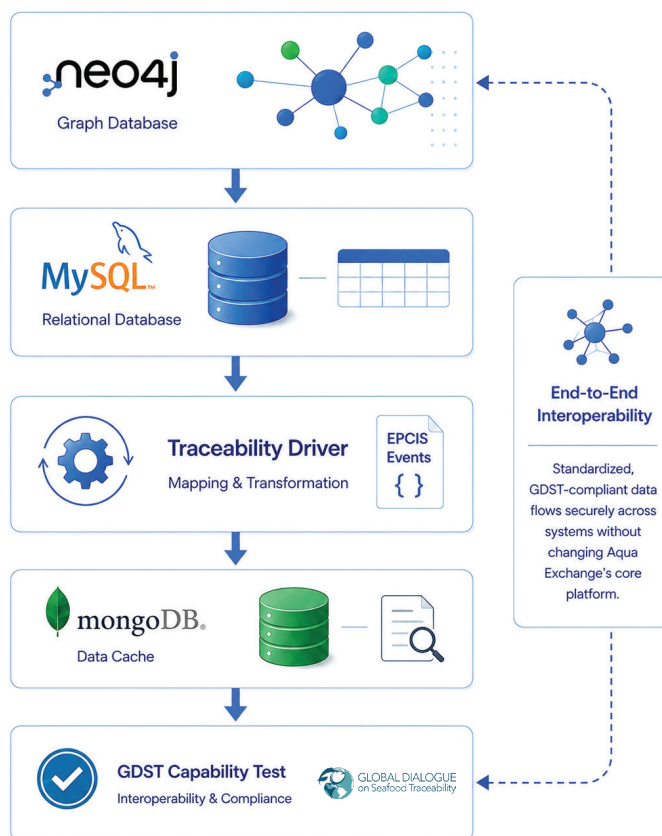


THE CHALLENGE

Aqua Exchange set out to pass the GDST Capability Test by initially attempting to build GDST capability directly within their platform. After 3–4 weeks of development, they were able to build portions of the schema, synchronization logic, and data relationships, but encountered challenges related to EPCIS event structure alignment, maintaining complex traceability flows, and ensuring end-to-end GDST-compliant event generation.

To simplify and accelerate implementation, Aqua Exchange decided to implement the Traceability Driver rather than continue building and maintaining the full GDST infrastructure themselves.

However, Aqua Exchange’s platform is built on Neo4j, a graph database, while the Traceability Driver currently focuses on common relational SQL database structures. This created an important implementation question: could the Traceability Driver still be effectively used without redesigning their existing system architecture or requiring a dedicated connector for their database model?



THE APPROACH

Rather than rebuilding their internal system to match GDST structures, Aqua Exchange implemented the Traceability Driver and created a mapping layer between their Neo4j database and a SQL database used by the Driver.

They developed scripts that span the relationships in Neo4j and load the relevant traceability data into a MySQL database. The Traceability Driver then reads from MySQL, transforms the data into GDST-compliant EPCIS events using mapping files, and stores the standardized data in a MongoDB cache, which serves as the GDST data layer for external queries.

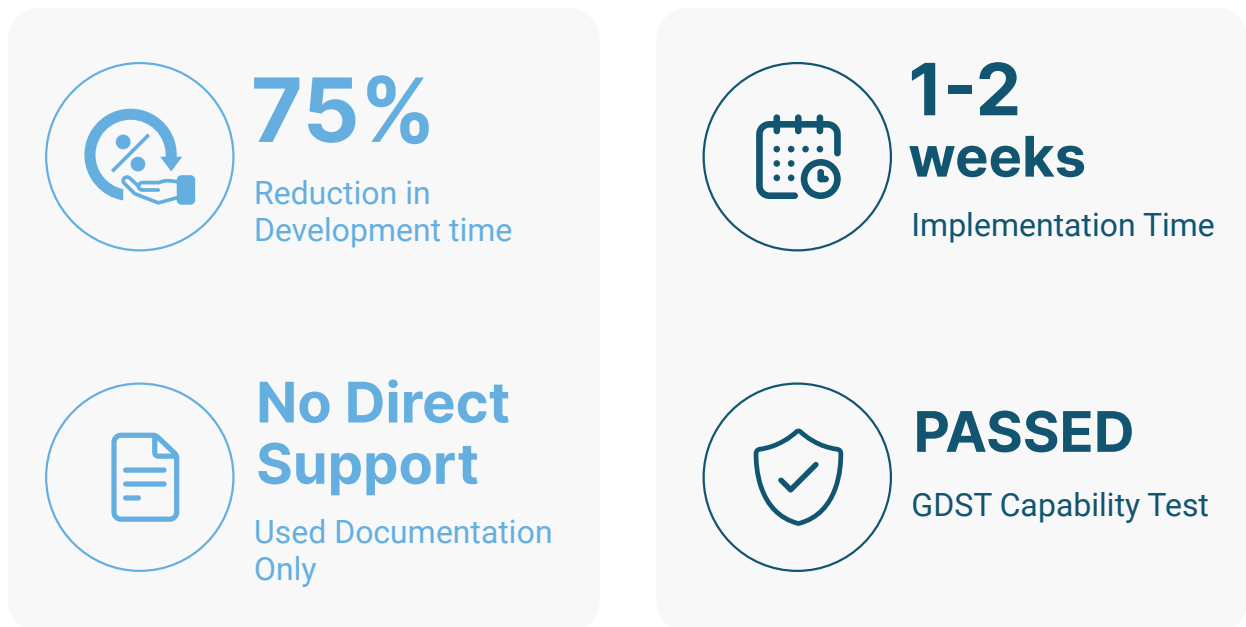
This architecture allowed Aqua Exchange to maintain their existing system design while still generating GDST-compliant data and passing the GDST Capability Test.

THE RESULTS

The full setup, configuration, testing, and deployment of the Traceability Driver took approximately 1–2 weeks. Aqua Exchange estimated that without the Traceability Driver, achieving stable GDST capability would have taken an additional 1–2 months, based on the complexity of EPCIS event structures, schema mapping, validation, and repeated testing cycles.

This represents an estimated ~75% reduction in development time to reach GDST Capability Test readiness. Importantly, Aqua Exchange implemented the Traceability Driver without direct implementation support, relying solely on the available documentation. Even in a non-SQL native environment (Neo4j), the team was able to independently build the necessary data mapping layer, deploy the Driver, and generate GDST-compliant data.

According to Aqua Exchange, the most time-consuming step was mapping graph relationships from Neo4j into normalized SQL tables while preserving traceability relationships between farms, ponds, feed, harvest events, and parties. However, once the mapping and synchronization layer was established, the Traceability Driver handled GDST event generation, formatting, and API services required for interoperability and for passing the GDST Capability Test.



WHAT THIS DEMONSTRATES

This case study demonstrates that the Traceability Driver can be implemented in non-standard technical environments, including graph database architectures, as long as a reliable mapping layer exists between the source data and the GDST data structure.

The primary implementation effort was not implementing GDST itself, but mapping business data into the appropriate structure. Once that mapping layer was established, the Traceability Driver handled GDST event generation, data formatting, and API services required for interoperability and for passing the GDST Capability Test.

This significantly reduced development time, complexity, and implementation risk, and allowed the Aqua Exchange team to focus on their core platform rather than building and maintaining GDST infrastructure from scratch.

AQUA EXCHANGE

Aqua Exchange is transforming aquaculture with innovative IoT technology and data-driven insights. The company empowers farmers by providing comprehensive, affordable solutions that enhance productivity and sustainability and has automated more than 80,000 acres of shrimp farms—making it the largest technology provider to shrimp farmers in India. All of Aqua Exchange's solutions hinge on the technology (IoT & AI) tools the company offers the farmers to save crops, reduce cost of production, and increase profitability. After passing GDST's Capability Test for digital data exchange, Aqua Exchange became India's first "Verified GDST-Capable Solution," affirming its ability to securely exchange standardized traceability data across the seafood supply chain.



GLOBAL DIALOGUE ON SEAFOOD TRACEABILITY

The Global Dialogue on Seafood Traceability (GDST) is an international, business-to-business platform dedicated to creating global standards and guidelines for interoperable seafood traceability. Founded in 2017 by WWF and IFT, GDST became a partnership Foundation in 2022, guided by a Supervisory Board comprising industry leaders that operates under the oversight of the Management Board, which facilitates collaboration and implementation of its objectives.

GDST's primary goal is to establish a common framework for seafood traceability that enables seamless data exchange across the supply chain. Its standards, including the Critical Tracking Events (CTEs) and Key Data Elements (KDEs), ensure that traceability systems are interoperable, addressing industry-wide challenges like combating illegal, unreported, and unregulated (IUU) fishing and improving sustainability practices.



The GDST has 131 Partners, including major seafood processors, retailers, software companies, NGOs and global brands. Notable partners include Agraya (GlobalG.A.P.), Wholefoods, Sainsbury's, Wegmans, Nestle Purina, Mars and WWF. GDST also works closely with international organizations like the FAO to align its standards with global fisheries management and policy frameworks.

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IFT'S GLOBAL FOOD TRACEABILITY CENTER (GFTC)

GFTC is an internationally recognized leader in food traceability, dedicated to advancing end-to-end tracking and data sharing throughout the global food supply chain. GFTC develops open-source, scalable tools and resources that drive digital transformation and enable comprehensive traceability for all actors in the food system – from producers and first-mile actors to processors, distributors, retailers, and regulators. GFTC collaborates with a diverse network of global partners – including industry, governments, NGOs, multilateral organizations, and technology providers – to advance best practices and accelerate the adoption of interoperable, digital traceability solutions.

