The Opportunity for a Common Language of Seafood Traceability

GDST Standards & Guidelines

Reliable, affordable, and efficient seafood traceability

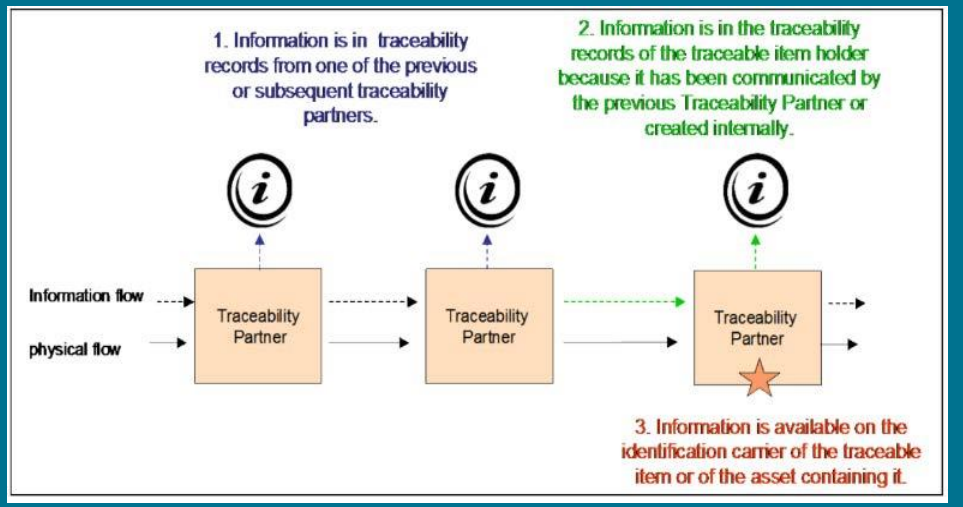
GLOBAL DIALOGUE on Seafood Traceability

What is data traceability?

Data traceability is the process of tracking data as it moves from one location to another. This can be done manually or through automated means. It is important for ensuring accuracy and completeness of data, as well as for auditing and compliance purposes.

There are many benefits to implementing data traceability, including:

1. Improved data quality
2. Reduced costs
3. Increased efficiency
4. Improved decision making
5. Enhanced security

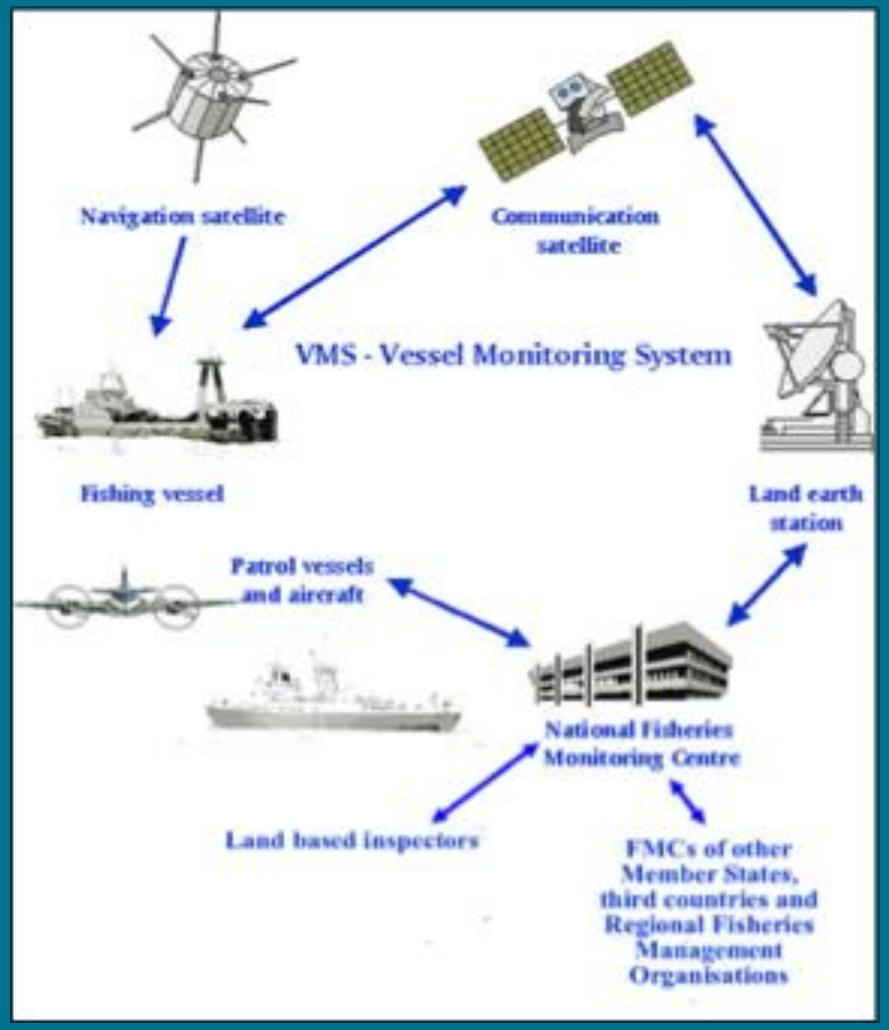


Source: GS1 Standard Document: Business Process and System Requirements for Full Supply Chain Traceability. Issue 1.3.0 (November 2012).

Data traceability is a critical component of any modern organization's data management strategy. By tracking data, organizations can ensure accuracy, completeness, and compliance with regulations. Data traceability can also improve the efficiency of business processes and enable better decision making.

SustainLab

What Are The Traceability Tools To Be Used?



Source: European Commission (2017)

Traceability isn't a new concept in the seafood industry. It has historically been achieved through a mix of paper-based and digital systems designed to ensure produce meets food safety standards. ***But in recent years, growing awareness of the industry's human rights abuses and environmental impacts have raised the stakes, expanding the scope of what we need to know about seafood to call it "sustainable" – namely who caught it, how it was caught, where from, whether it was legal and everyone that had contact with it in the supply chain.***

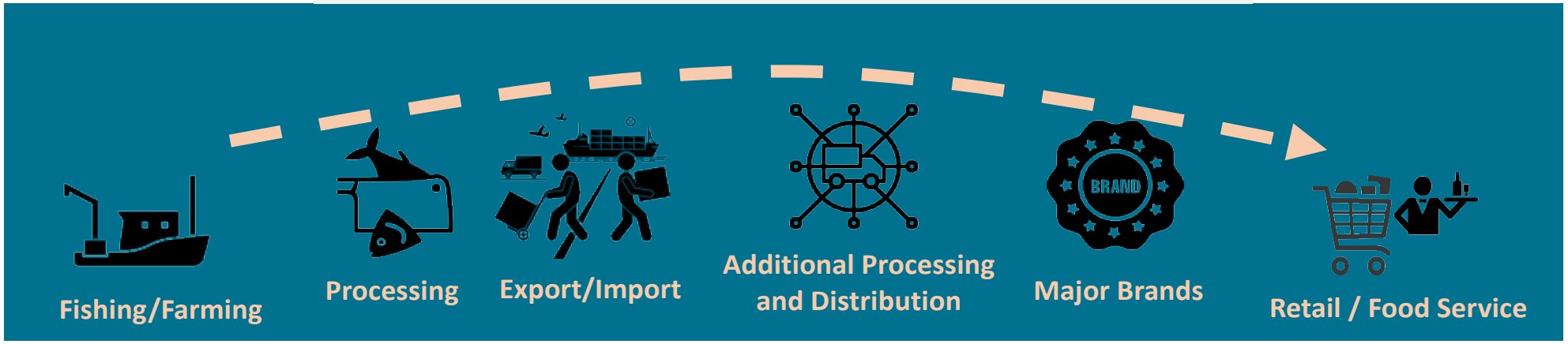
The first big step in this direction came about 10 to 15 years ago with the widespread switch from largely paper-based catch records to electronic catch documentation schemes. These are now supplemented by other digital tools, many focused on the "first mile" when, and shortly after, fish are captured at sea. That's where the critical traceability data can be gathered – the who, what, where and how of seafood. First-mile data can be the most difficult to collect downstream in a standardized digital format.

China Ocean Dialogue

The Global Dialogue on Seafood Traceability (GDST)

…is a global Partnership and participation organization dedicated to advancing the standardization and adoption of Interoperable Traceability throughout fishery and aquaculture supply chains

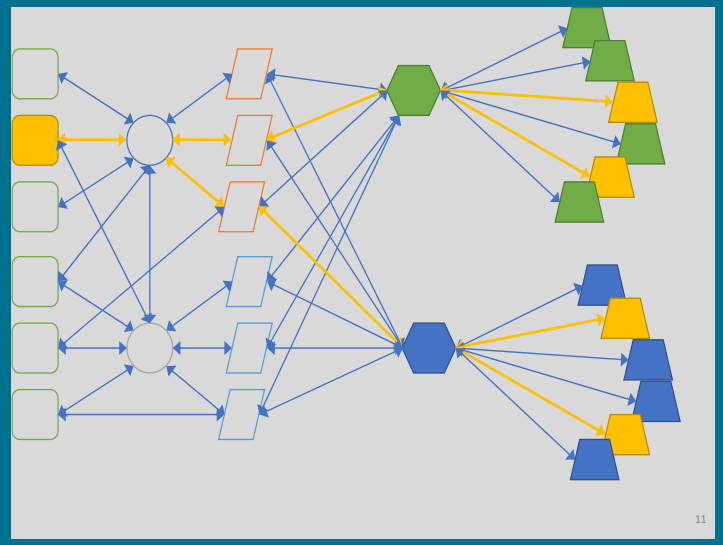
GDST supply chain diversity



GDST Standards For Interoperable Seafood Traceability Systems

Interoperability —"the ability of different information technology systems or software programs to communicate seamlessly for the purpose of exchanging, interpreting and using data" (Bhatt and others 2016)

GDST 1.1 Interoperability



- **HOW** data can be standardized and shared **(EPCIS - Interoperability Guidelines)**
- **WHO** in the supply chain is responsible for that data capture **(The CTE List)**
- **WHAT** data/key data elements needs to be captured and transferred **(The KDE List)**

Key Data Elements (KDEs): More than just a list

KDE No.	KDE Name	KDE Definition	Standard Data Options	Standards Org.	List Link	Authoritative Data Source	Authoritative Data Document
W02	Vessel Registration	standardized number or identifier for distinguishing vessels registered under the same flag nation.	Free-entry Field	N / A	N / A	Flag state regulatory body with oversight of the nation's fishing fleet	Respective Flag state fishing vessel registry
W03	Unique Vessel Identification	identifier associated with a vessel for the duration of its existence that cannot be re-used by any other vessel with a permanent physical marking on the craft.	IMO Number registry managed by IHS Maritime (For eligible vessels)	International Maritime Organization (IMO) - http://www.imo.org/en/ourwork/msas/pages/imo-identification-number-scheme.aspx http://www.fao.org/fishery/docs/DOCUMENT/global_record/2015/inf9e.pdf	https://gisis.imo.org/Public/SHIPS/Default.aspx	IHS Maritime on behalf of the International Maritime Organization	The IHS Maritime registry of valid IMO numbers
W05	Gear Type	equipment used to extract seafood from water for capture.	The International Standard Statistical Classification of Fishing Gear (ISSCFG) Revision 1	UN-FAO's Coordinated Working Party on Fishery Statistics (CWP)	http://www.fao.org/3/a-bt987e.pdf	Fishing vessel captain	Captain's logbook / harvest records

41 Fisheries KDEs Mapped to Critical Tracking Events

Basic Universal List of Key Data Elements (Wild-capture Products)	CTEs						
	Catch	On Vessel Processing	Transshipment	Landing	Aggregation/ Disaggregation	Ship/Receive	Processing
VESSEL DATA (master level data)							
Vessel Name	X	X					
Vessel Registration	X	X					
Unique Vessel Identification	X	X					
Public Vessel Registry Hyperlink	X	X					
Vessel Flag	X	X					
Availability of Catch Coordinates	X						
Satellite Vessel Tracking Authority	X						
Transshipment Vessel Name			X				
Transshipment Vessel Unique Vessel ID			X				
Transshipment Vessel Registration			X				
Transshipment Vessel Flag			X				
CATCH DATA							
Catch Area	X						
Fishery Improvement Project	X						
Vessel Trip Dates	X						
Date(s) of Capture	X						
Gear Type	X						
Production Method	X						
TRANSSHIPMENT DATA							
Transshipment Location			X				
Dates of Transshipment			X				
(LANDING DATA							
Landing Location				X			
Dates of Landing				X			
PROCESSING DATA							
Expiry / Production date		X					X
Product Origin		X					X

Basic Universal List of Key Data Elements (Wild-capture Products)	CTEs						
	Catch	On Vessel Processing	Transshipment	Landing	Aggregation/ Disaggregation	Ship/Receive	Processing
CERTIFICATIONS AND LICENSES							
Fishing Authorization	X						
Harvest Certification	X						
Harvest Certification Chain of Custody		X	X		X	X	X
Transshipment Authorization			X				
Landing Authorization				X			
Existence of Human Welfare Policy	X	X	X	X			X
Human Welfare Policy Standards	X	X	X	X			
TRACEABLE OBJECT INFORMATION							
Species	X	X	X	X	X	X	X
Product Form	X	X	X	X	X	X	X
Item / SKU / UPC / GTIN	X	X	X	X	X	X	X
Linking KDE (batch, lot or serial number)	X	X	X	X	X	X	X
Weight or Quantity	X	X	X	X	X	X	X
Unit of Measure	X	X	X	X	X	X	X

21 Aquaculture KDEs Mapped to Critical Tracking Events

Basic Universal List of Key Data Elements (Aquaculture Products)	CTE					
	Feedmill (Transform)	Hatchery (Hatch)	Farm (Harvest)	Processor (Process/Pack)	Aggregation/ Disaggregation	Ship/Receive
LOCATION MASTER DATA						
Organization	X	X	X	X	X	X
Location name[10]	X	X	X	X	X	X
Location ID	X	X	X	X	X	X
Location Address or Geo-Coordinates	X	X	X	X	X	X
Location Country	X	X	X	X	X	X
FEED DATA						
Source of protein	X					
HATCHERY DATA						
Harvest date per tank		X				
Source of broodstock		X				
FARM DATA						
Farming method			X			
Date of Harvest			X			
PROCESSOR DATA						
Product Form				X		
Production date				X		
Product Origin				X		
CERTIFICATIONS AND LICENSES						
License[11]				X	X	
Certification	X	X	X	X		
Certification Chain of Custody	X	X	X	X		
Existence of Human Welfare Policy	X	X	X	X		
Human Welfare Policy Standards	X	X	X	X		
TRACEABLE OBJECT INFORMATION						
Species		X	X	X		
Item / SKU / UPC / GTIN	X	X	X	X	X	X
Linking KDE (batch, lot, serial number)	X	X	X	X	X	X
Weight / Quantity	X	X	X	X	X	X
Units of Measure	X	X	X	X	X	X

The GDST's Main Role: Applied Voluntary Industry Standards

GLOBAL DIALOGUE on Seafood Traceability

Standards & Guidelines for Interoperable Seafood Traceability Systems — Core Normative Standards (Version 1.1)

March 2022

GS1 Foundation for Fish, Seafood and Aquaculture Traceability Implementation Guideline

provides guidance to the fish, seafood and aquaculture industry to implement GS1 standards.

Release 1.0, Ratified, June 2015

KDE No.	KDE Name	KDE Definition	Standa	List Link
W02	Vessel Registration	standardized number or identifier for distinguishing vessels registered under the same flag nation.	Free-entry Fiel	
W03	Unique Vessel Identification	identifier associated with a vessel for the duration of its existence that cannot be re-used by any other vessel with a permanent physical marking on the craft.	IMO Number registry managed by IHS Maritime (For eligible vessels)	Inte. Orga. http://w n/ourwork, /imo-ident. number-schei. http://www.fao. hery/docs/DOCUM /global_record/2015, f9e.pdf
W05	Gear Type	equipment used to extract seafood from water for capture.	The International Standard Statistical Classification of Fishing Gear (ISSCFG) Revision 1	UN-FAO's Coordinated Working Party on Fishery Statistics (CWP) http: /a

Basic PTI Sample Master Data Set showing PTI csv File and GDSN Equivalent

	PTI CSV			GDSN Equivalent		EXAMPLE (PTI CSV)
	CSV Column Header	PTI CSV Produce Industry required field's		Green cells are GDSN mandatory	Yellow cells are GDSN Dependent - require additional fields to be populated or require use of 2 level GDSN hierarchy	PTI CSV communication tool use
	PTI CSV Industry Field Name	CSV Produce Industry Definition	Data Type	GS1 Global Data Dictionary Tag	Global Data Dictionary Definition	Example product: Case of Iceberg lettuce cello wrap 24 count
1	GTIN	Global Trade Identification Number. The 14 digit number that uniquely identifies this item from a specific supplier. Contains the GS1 Vendor supplier number, the vendor assigned item number, and calculated check digit.	Numeric (14 digits)	globalTradeItemNumber		20614141333336
2	Description	General item description. Should identify commodity and or variety of product. Can include count, or size, or weight, and packaging of consumer items contained in shipper.	Allows for a language qualifier (1 to 17 characters) F			LETTUCE ICEBERG 24 COUNT CELLO WRAP
3	Commodity	General produce category. Guidance is provide th GPC Brick Name. (e Grapefruits, Honeydew, Hor Lettuce)				HEAD/ICEBERG LETTUCE

Best Practices for Data Synchronization

1. Assign responsibility for conveying GTIN information. The seller – and specifically those person(s) who fulfill buyers' orders – is responsible for providing information for each GTIN shipped to buyers, using the PTI-developed Data Synchronization Template (DST) to develop your company's customized data synchronization spreadsheet; this includes both product procured internally and externally. As the entity primarily responsible for order fulfillment, the seller has the responsibility to ensure that what is shipped to the buyer has been previously approved and is set up in the buyers' receiving systems for receipt well in advance.

2. Provide your data synchronization spreadsheet electronically well in advance before shipping product. Your Data Synchronization Spreadsheet, listing each GTIN, should be emailed to each buyer customer. To ensure buyers have sufficient time to enter the information into their receiving systems, the spreadsheet should be sent well in advance before product is shipped.

If there is an urgent need to establish a new GTIN, the brand owner's responsible party should

. . . but WHY?

IT Guidance: EPCIS formats for digital interoperability

GDST uses GS1 EPCIS as a backbone

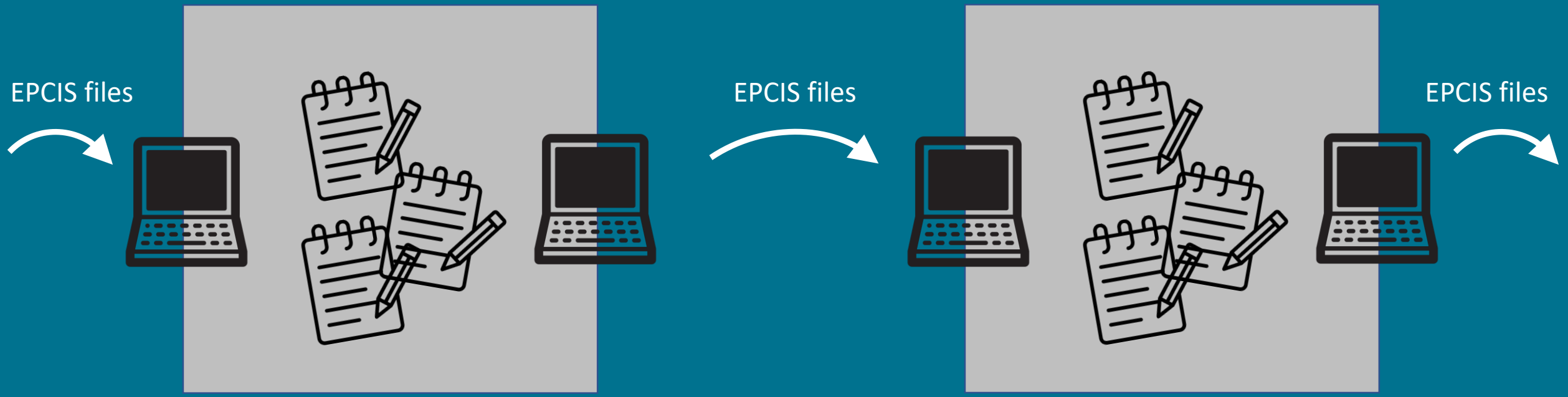
Table W2d – Landing Data (event level)

Name	Type	Definition	GS1 CBV Attribute	Link for More Info
Landing Location	Location	Where seafood was first discharged to land.	In-port: unloadingPort	CBV Info
			Non-port: Geo Coordinates	CBV Info
Dates of Landing	Date	Calendar start and end dates when seafood is discharged to a landing location.	landingStartDate + landingEndDate	YYYY-MM-DD GDST Extension

Table C1: GDST CTEs and Accompanying Business Steps

Critical Tracking Event	Description	EPCIS Event Group	EPCIS Action	EPCIS Business Step	EPCIS Disposition	Reference Type
Harvest Events (Catch, Farm)						
Catch	Event where wild-caught product for consumption is first commissioned.	Object	Add	urn:epcglobal:cbv:bizstep:catch	active	N Outputs
Farm Harvest	Event where aquaculture product for consumption is first commissioned.	Object OR Transformation	Add	urn:epcglobal:cbv:bizstep:farmHarvest	active	N Outputs
Transformation Events (Feedmill, Hatching, Processing, On-Vessel Processing)						
Commingling	Transformation wherein multiple batch/lots are combined into single batch/lot without substantial product form change.	Transformation	Add	urn:gdst:bizstep:commingling	active	N Input and 1 Output

GDST 1.1 encourages but does not require full digitization

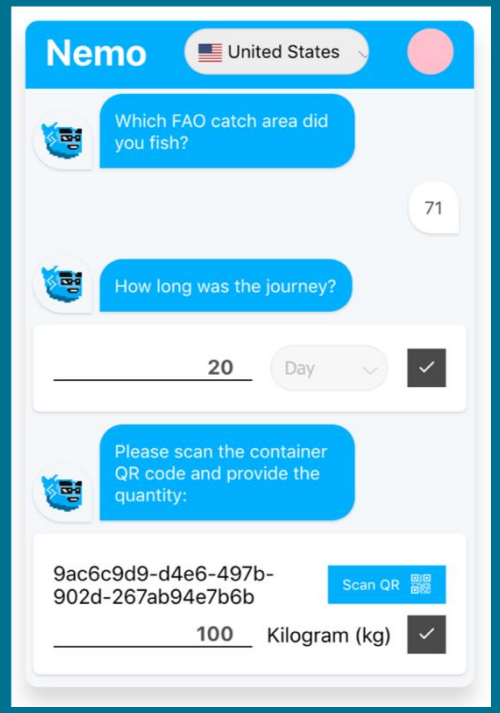


GDST 1.1 only requires external digital data sharing

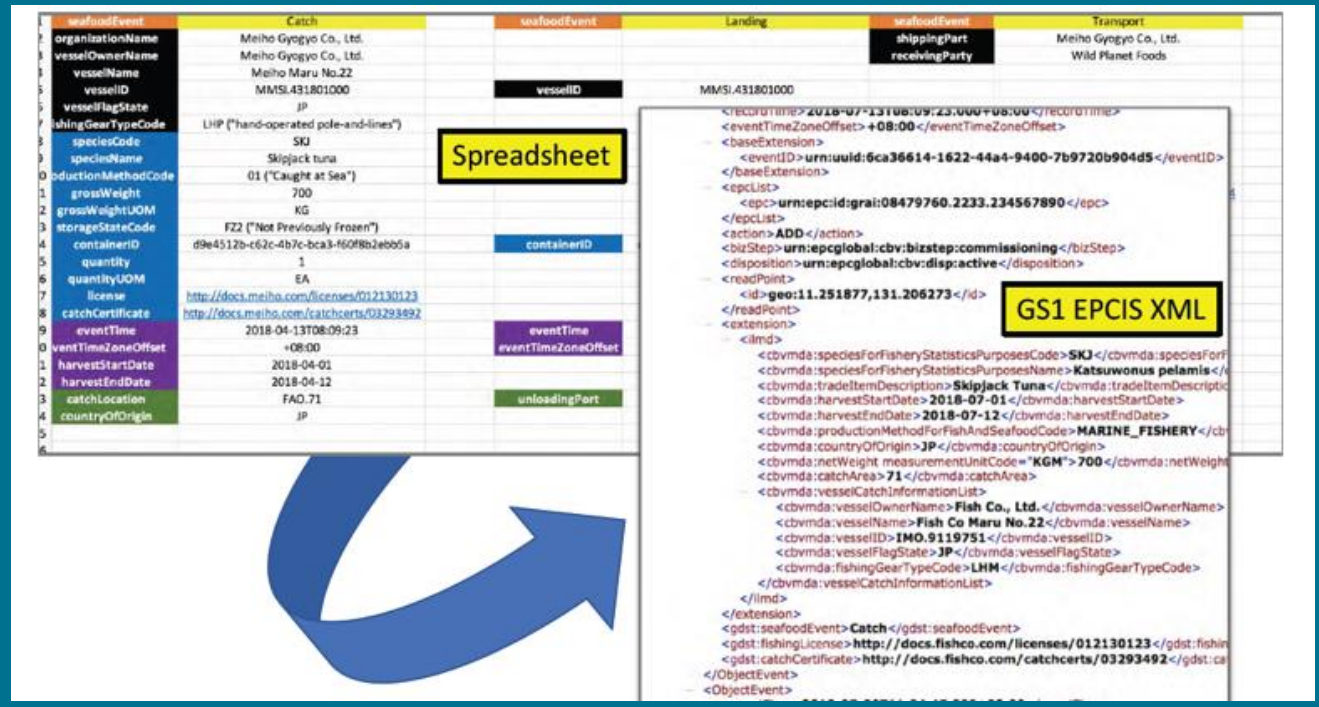
(although internal digitization offers significant benefits)

GDST 1.1 is for users at all levels of technology adoption

Implementation can start with a low level of technology or digitization



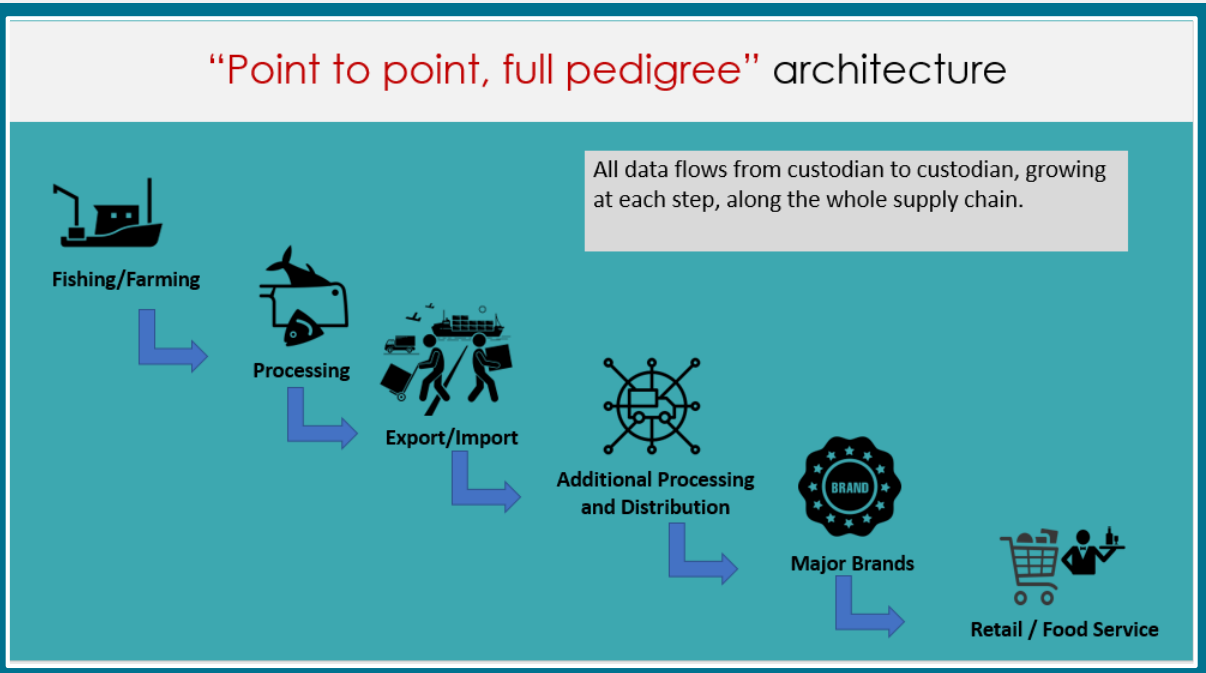
Cell phone SMS input → EPCIS XML File



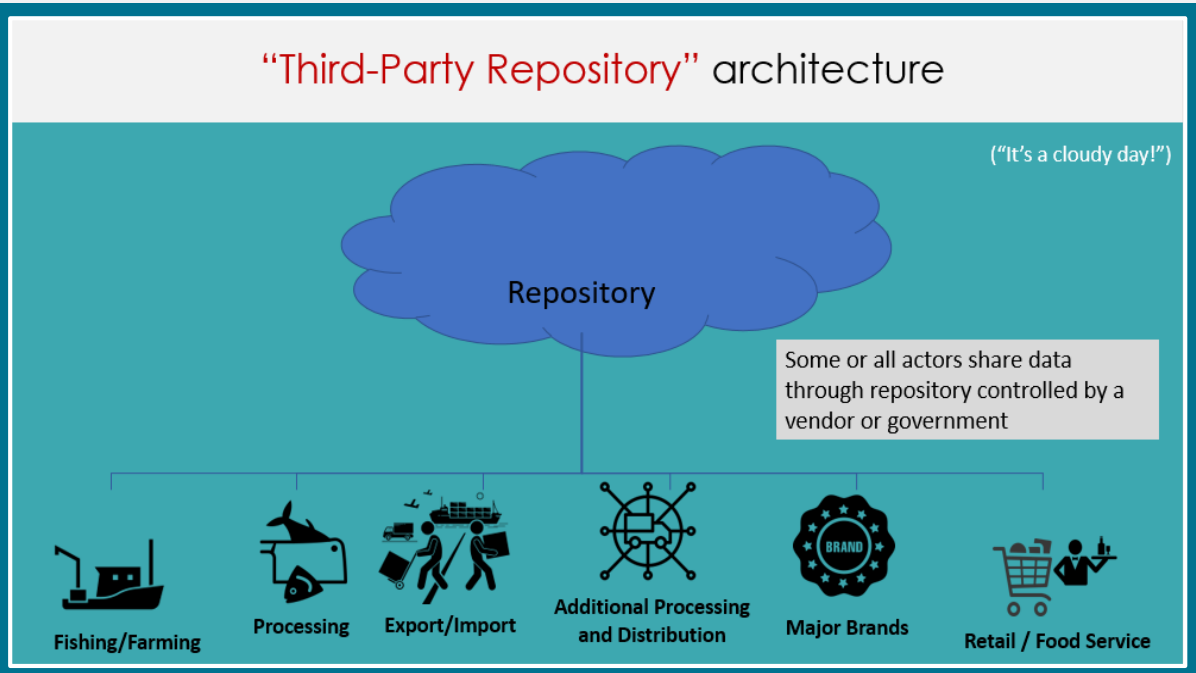
Excel Spreadsheet → EPCIS XML File

Diverse data-sharing architectures

"Point to point, full pedigree" architecture

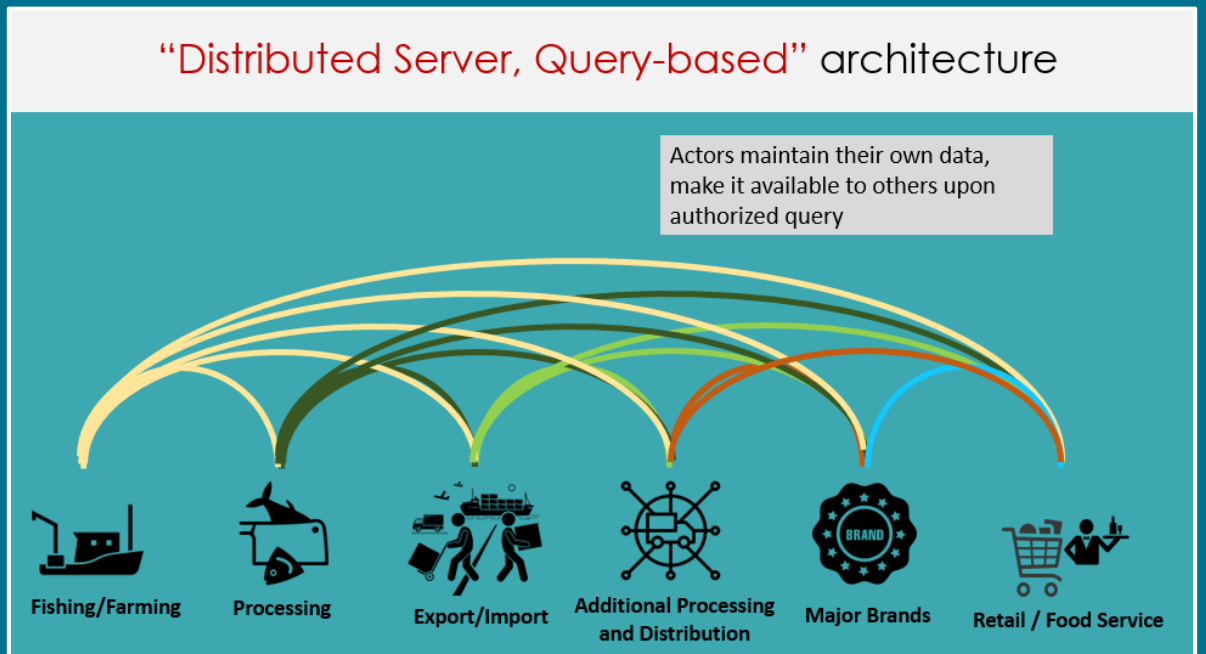


"Third-Party Repository" architecture



→ need standardization

"Distributed Server, Query-based" architecture



→ data access routines

Why adopt the standard or become a GDST partner?

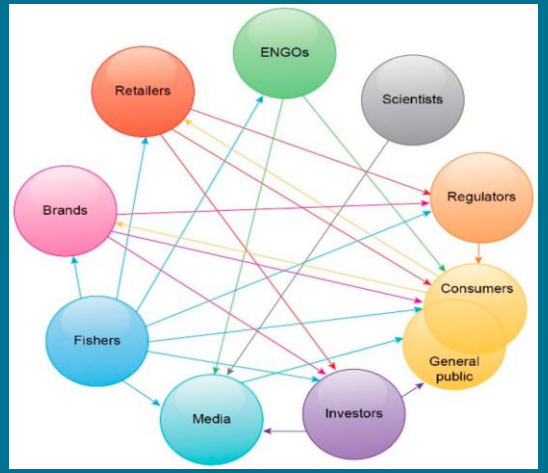
Because good data traceability management is the foundation of all Certification evidences, and the seafood industry has a fit-for-purpose standard that defines its interoperability.

Key Motivations/Participation Drivers

Regulatory Compliance
Import/Export Reporting
Food Safety Test Results
IUU/Port State measures

Supply Chain Traceability
Provenance/Processing records
Product Testing and Recall Data
Mass Balance/Total Traceability

Responsible Sourcing Assurances
Fair labor Indicators/Recruitment history
Food Safety/Environmental Responsibility
Social Accountability-EHS/Animal Welfare



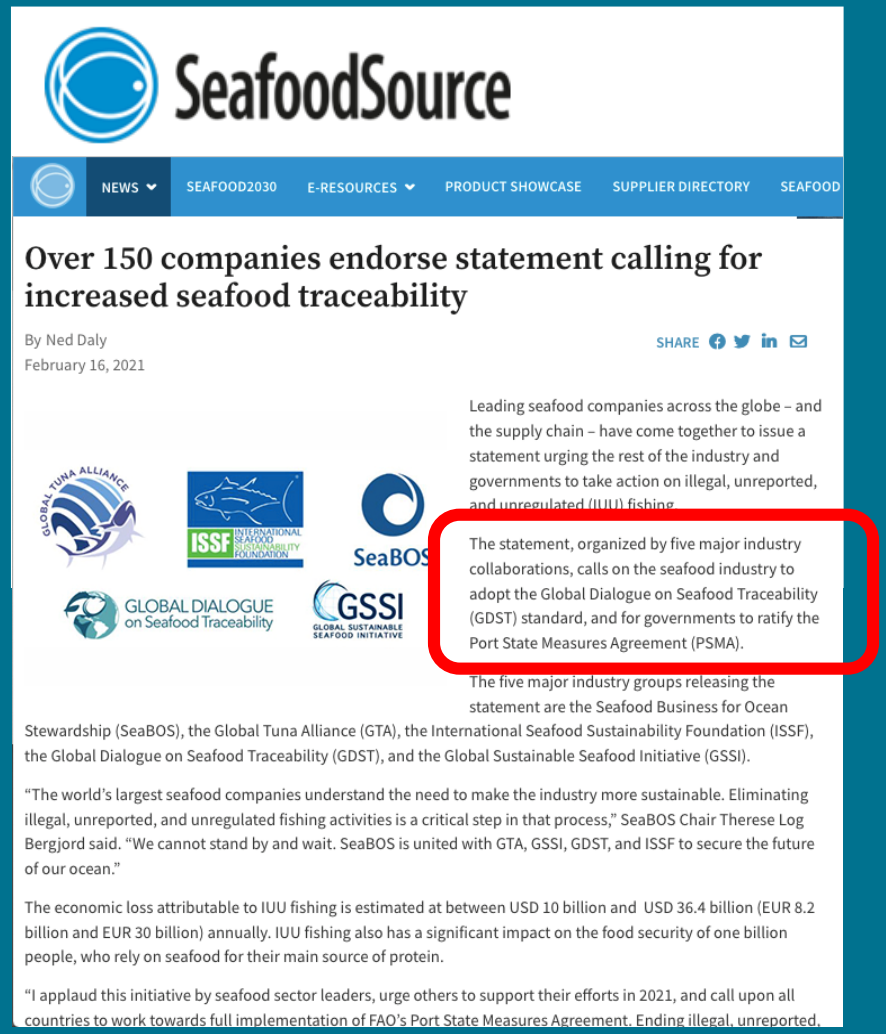
Support from other Key Stakeholders

Endorsements by leading organizations and industry groups

Endorsements by leading technology vendors

GDST – A Top Priority Across Industry Groups

GDST and four seafood industry groups (together representing over 150 companies) -
GSSI (Global Sustainable Seafood Initiative),
ISSF (International Seafood Sustainability Foundation),
SeaBOS (Seafood Business for Ocean Stewardship), and
GTA (Global Tuna Alliance)
- joined to endorse a major statement in February 2021:



SeafoodSource

NEWS | SEAFOOD2030 | E-RESOURCES | PRODUCT SHOWCASE | SUPPLIER DIRECTORY | SEAFOOD

Over 150 companies endorse statement calling for increased seafood traceability

By Ned Daly
February 16, 2021

SHARE

Leading seafood companies across the globe – and the supply chain – have come together to issue a statement urging the rest of the industry and governments to take action on illegal, unreported, and unregulated (IUU) fishing.

The statement, organized by five major industry collaborations, calls on the seafood industry to adopt the Global Dialogue on Seafood Traceability (GDST) standard, and for governments to ratify the Port State Measures Agreement (PSMA).

The five major industry groups releasing the statement are the Seafood Business for Ocean Stewardship (SeaBOS), the Global Tuna Alliance (GTA), the International Seafood Sustainability Foundation (ISSF), the Global Dialogue on Seafood Traceability (GDST), and the Global Sustainable Seafood Initiative (GSSI).

"The world's largest seafood companies understand the need to make the industry more sustainable. Eliminating illegal, unreported, and unregulated fishing activities is a critical step in that process," SeaBOS Chair Therese Log Bergjord said. "We cannot stand by and wait. SeaBOS is united with GTA, GSSI, GDST, and ISSF to secure the future of our ocean."

The economic loss attributable to IUU fishing is estimated at between USD 10 billion and USD 36.4 billion (EUR 8.2 billion and EUR 30 billion) annually. IUU fishing also has a significant impact on the food security of one billion people, who rely on seafood for their main source of protein.

"I applaud this initiative by seafood sector leaders, urge others to support their efforts in 2021, and call upon all countries to work towards full implementation of FAO's Port State Measures Agreement. Ending illegal, unreported,

The statement, organized by five major industry collaborations, calls on the seafood industry to adopt the Global Dialogue on Seafood Traceability (GDST) standard, and for governments to ratify the Port State Measures Agreement (PSMA).

GDST identified as one of two top priorities for fighting IUU

Markets and Their Import Requirements

3 markets – EU, US, and Japan
64% of total value of world imports of fish and fish products (2016 data)

	EU IUU regulation	US FDA	US SIMP	Japan*
Purpose	IUU	Public's health	IUU	IUU
Species	All marine fishey products	Finfish, crustaceans, mollusks, bivalves	13 species - abalone, blue crab, grouper, shrimp, red snapper, tuna	Tuna and Patagonian toothfish
Wild-caught Fisheries or Aquaculture	Wild-caught fisheries	Both Fisheries & Aquaculture	Both Fisheries & Aquaculture	Wild-caught fisheries

* Law of Special Measures for Strengthening Conservation and Management of Tuna Resources

Markets and Their Import Requirements (2)

EU is the largest importer of seafood in the world

- Main products: salmon, cod, shrimp and tuna
- Main suppliers: Norway, Russia, Ecuador, Vietnam, India and Argentina
- **EU IUU regulation (Catch Certificate Scheme) – 2010**
- All catches of marine fishery products

US is the second largest importer of seafood in the world

- Main products: salmon, shrimp and tuna (steak and canned)
- Main suppliers: East Asia
- **Seafood Import Monitoring Program – 2016**
- 13 species: Abalone, Atlantic cod, blue crab, mahi mahi, grouper, king crab, pacific cod, red snapper, sea cucumber , sharks, shrimp, swordfish, and tunas – (albacore, big eye, skipjack, yellow fin, bluefin)
- Include wild-caught fisheries and aquaculture products
- Single data portal for all import and export reporting

Markets and Their Import Requirements (3)

Japan is the third largest importer of seafood in the world

- Main products: fresh and frozen tuna, eels, shrimp, crabs and salmon
- Main suppliers: China, the US, Chile and Russia
- Committed to 3 species –related Catch Documentation Scheme (CDS)

1. Southern bluefin tuna CDS
   Commission for the Conservation of Southern bluefin Tuna (CCSBT, 2010)
2. Atlantic bluefin tuna eBCD
   International Commission for the Conservation of Atlantic Tunas (ICCAT, 2008 -> 2016)
3. Patagonian toothfish CDS
   Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR, 2000)
4. Bigeye tuna (Statistical Documents)
   Indian Ocean Tuna Commission (IOTC)

Japan considers developing its own unilateral import control scheme.

Level of Digitalization

EU: has developed an IT system for CDS (CATCH) which is currently being trialed.

Article 58 of the **proposal** of the Control Regulation (EU)

Traceability

1. Lots of fishery or aquaculture products shall be **traceable at all stages of production, processing and distribution**, from catching or harvesting to retail stage, including fisheries and aquaculture products which are destined for export

2.Operators at all stages of production, processing and distribution, from catching or harvesting to retail stage, shall ensure that for each lot of fishery or aquaculture products,

- (a) is **kept on record in a digitalised way**;
- (b) is made available upon request to competent authorities;
- (c) is transmitted or made available, **electronically**, to the business operator to whom the fishery product or aquaculture product is supplied.

Level of Digitalization (2)

US SIMP: Import data captured in digital format. National Permitting System to get International Fisheries Trade Permit (IFTP).

Japan: Atlantic bluefin tuna - ICCAT – transitioned from paper to electronic-based in 2016, other systems are not required in digital format.

	EU	US FDA	US SIMP	Japan			
				ICCAT	CCSBT	CCAMLR	IOTC
	All catches of marine fishery products	Finfish including smoked finfish, Crustaceans, Mollusks, Bivalves	13 species: Abalone, atlantic cod, blue crab, mahi mahi, grouper, king crab, pacific cod, red snapper, sea cucmber , sharks, shrimp, swordfish, tunas	Atlantic Bluefin Tuna	Southern Bluefin Tuna	Toothfish (Dissostichus)	Bigeye tuna
Import data captured in digital format							

A Common Approach for Seafood Traceability

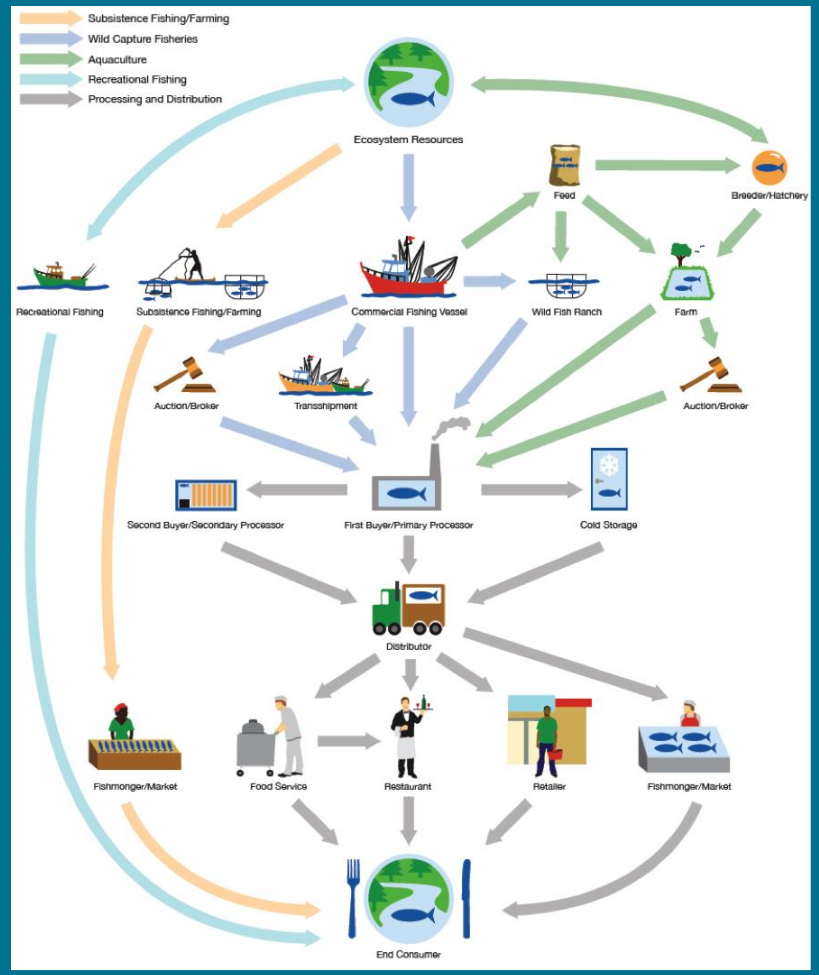


Image: FishWise

GDST standards provide the communication "pathway" for an agreed set of CTEs/KDEs. They do not favor one type of software over another or dictate how a traceability system "should" be built.

Whether you harvest, process or trade seafood, applying GDST standards helps achieve regulatory compliance, gives supply chain visibility to your customers and supports buyer specification requirements.

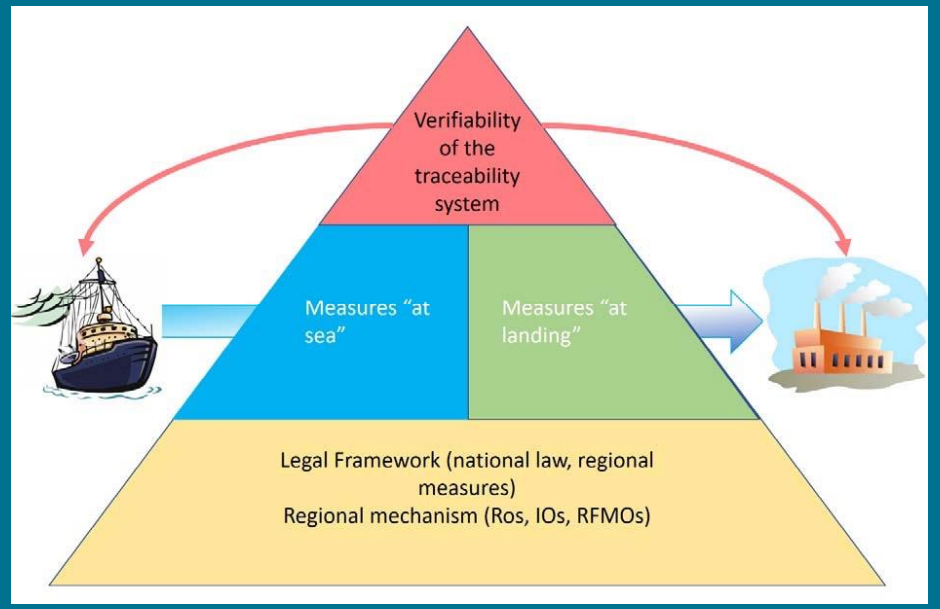


Image: FAO

Benefits & what if…?

- Digitization reduces double-entry
- Facilitates more automated validation checks
- Compliments existing systems & is scalable (new KDEs)
- Future-proofs government compliance requirements
- Common language – seafood products & technology

- You can implement for small, large and industry companies at all stages in supply chain?
- You have one-version of the truth with compliance dashboards
- The same data can be provided to multiple customers in different formats but driven by the same initial data
- You have the ability to integrate traceability data into other business systems?

TECHNOLOGY SOLUTION PROVIDERS

Companies providing seafood traceability technologies or data input systems

SUPPORT GDST 1.1

- ✓ Apply to be listed as a provider of GDST-adherent technologies or traceability systems
- ✓ Join the Dialogue Advisory Group (DAG) to provide input on GDST decision-making
- ✓ Support your customers with GDST 1.1 implementation
- ✓ Develop & launch GDST compliant solutions

Visit **traceability-dialogue.org/get-involved**

RESOURCES

GDST Standards and Guidelines

COMPANY RESOURCES

- ✓ **Implementation Roadmap**
  A tool to help companies evaluate the benefits and challenges of implementing GDST 1.1
- ✓ **Implementation Metrics Rubric**
  A tool to give companies a quantitative framework to assess their progress towards implementing the GDST 1.1 Standards.
- ✓ **Educational Materials**
  Online library of diverse case studies, informational videos, and presentations to guide implementation

TECHNOLOGY RESOURCES

- ✓ **Developer Documentation (GitHub)**
  An online hub that documents scenarios outside the scope of GDST 1.1 and other explanatory information.
- ✓ **GDST Public Slack Channel**
  An open channel for companies looking to discuss The implementation and interoperability of GDST 1.1.
- ✓ **IT CoMap Tool**
  A tool that can be used to generate an XML file and map existing data models to the GDST data model. Please email the GDST Secretariat for more information.

Visit https://traceability-dialogue.org/resource-library

Thank You

info@traceability-dialogue.org
huw.thomas@thegdst.org
traceability-dialogue.org

GLOBAL DIALOGUE on Seafood Traceability

Follow Us

@The Global Dialogue on Seafood Traceability

@The GDST