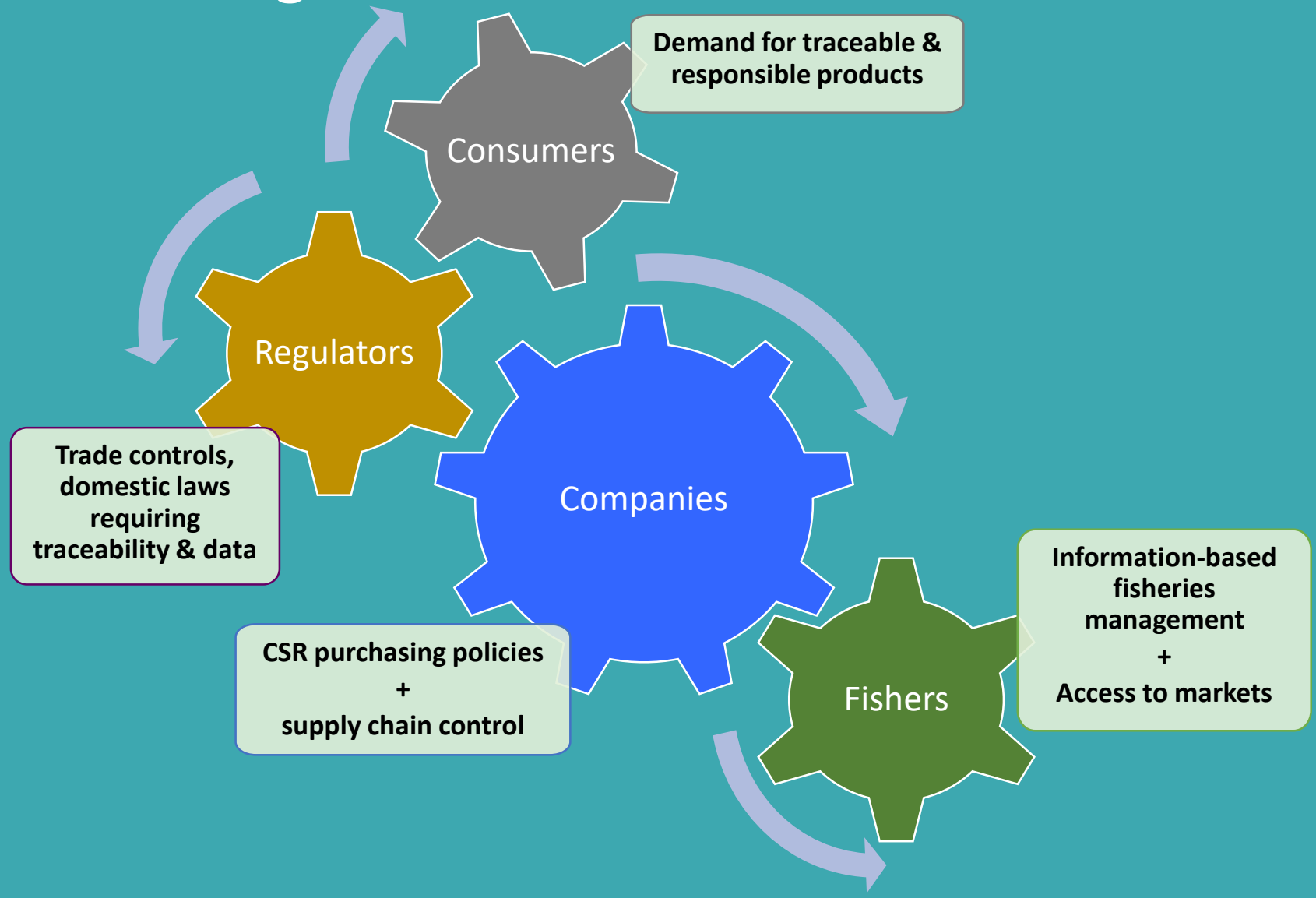
GLOBAL DIALOGUE on Seafood Traceability

The Global Dialogue on Seafood Traceability:
Towards One Common Tuna Traceability Protocol

Traceability is Happening

The Context is Evolving



To globalize responsible supply chains we must:

Enable full chain transparency (without mandating it)

Support data reliability and verification

Drive down costs, raise returns
for investments in digital data capture and data exchange

➔ Focus on interoperability and verifiability

However, there are issues…

- **Technology confusion** (dozens of solutions, 100s of vendors)
- Systems in **non-interoperable silos** --> rigidity + vendor-capture
- Obstacles to **data creation/acquisition**
  (inconsistent demands on suppliers = confusion, costs ↑, motivation ↓)
- Diverse **information reporting requirements** growing & diverging
  - international proliferation of **regulations**
  - growing and shifting **consumer/NGO demands**

Overview of the GDST

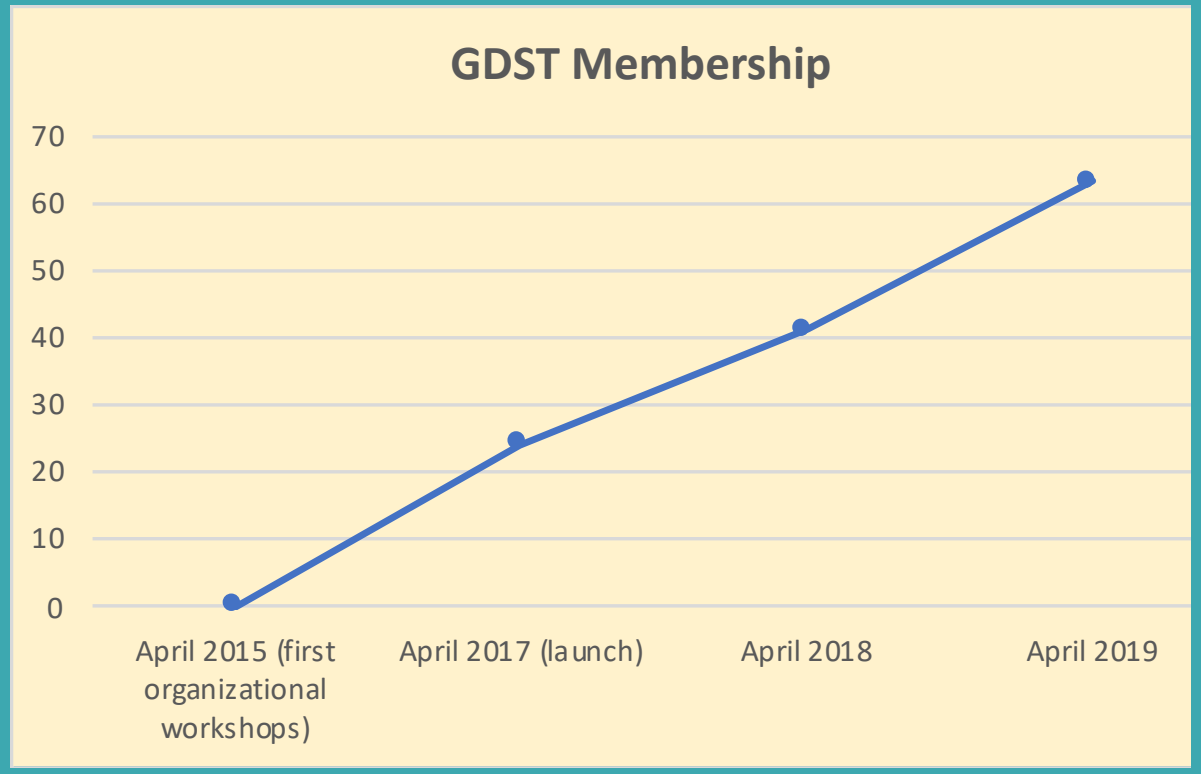
GLOBAL DIALOGUE on Seafood Traceability

The GDST is a global, precompetitive, business-to-business platform launched in 2017

Primary Goal:

Voluntary industry standards for interoperable seafood traceability

GDST has grown into a significant, powerful "B2B" platform



67 companies have joined or endorsed GDST

7 of top 10

USD $35B/yr

GLOBAL DIALOGUE on Seafood Traceability

A. Espersens A/S – Ahold Delhaize – Ajinomoto Co., Inc – 178 Degrees – Aldi Nord – Anova Food USA – AP2HI – Asian Alliance International Company – Charoen Pokphand Foods Public Company Limited (CPF) – Bolton Food – Bomar (PT. BOGATAMA MARINUSA) – Culinary Collaborations LLC – Bumble Bee – General Tuna Corporation (Century Pacific Tuna) – Japanese Consumers' Co-operative Union – China Aquatic Products Processing & Marketing Alliance (CAPPMA) – Citra Mina – Lyons Seafood – Envisible – Fishin Company – Hong Kong Exhibition Centre – Intercity Packers Meat & Seafood – LDH (La Doria) Ltd. – Lidl Stiftung & Co, KG – Luen Thai Fishing Venture – Metro – Publix Super Markets, Inc. – Sainsbury's Supermarkets Ltd – Morrisons Supermarkets – Mt Cook Alpine Salmon – Seachill Part of the Hilton Food Group – Seacore – New England Seafood – Southeast Asian Packaging and Canning Ltd – Stavis Seafoods – Sysco Corp – Target – Nissui – Thai Union – Orca Bay – PT Bumi Menara Internusa (BMI) – Wegmans – Santa Monica Seafood – Sea Delight – Socsksargen Federation of Fishing and Allied Industries, Inc. – Taylor Shellfish – Woolworths Group – Co-op UK – Thai Tuna Industry Association – Tri Marine – Vietnam Association of Seafood Exporters and Producers – Vinatuna – Whole Foods – World Tuna Purse Seine Organization – Pacifical – Karoo Catch – Tesco – Silver Coast Foods LLP – Young's Seafood

+ SeaBOS endorsement

GDST geographic diversity

Canada
- Intercity Packers Meat & Seafood
- Seacore

USA
- Anova Food USA
- Bumble Bee
- Culinary Collaborations LLC
- Envisible
- Fishin Company
- Orca Bay
- Publix Super Markets, Inc.
- Santa Monica Seafood
- Sea Delight
- Stavis Seafoods
- Sysco Corp
- Target
- Taylor Shellfish
- Tri Marine
- Wegmans
- Whole Foods

UK
- Co-op UK
- LDH (La Doria) Ltd.
- Lyons Seafood
- Morrisons Supermarkets
- New England Seafood
- Sainsbury's Supermarkets Ltd
- Seachill
- Tesco
- Young's Seafood Ltd

Denmark
- A. Espersens A/S

Germany
- Aldi Nord
- Lidl Stiftung & Co, KG
- Metro

Italy
- Bolton Foods

Netherlands
- Ahold Delhaize
- Pacifical

Turkey
- Eciens

South Africa
- Karoo Catch

Australia
- Woolworths Group

China
- China Aquatic Products Processing & Marketing Alliance (CAPPMA)
- Hong Kong Exhibition Centre
- Luen Thai Fishing Venture

Hong Kong
- 178 Degrees

India
- Silver Coast Foods LLP

Indonesia
- AP2HI
- Bomar (PT. BOGATAMA MARINUSA)
- PT Bumi Menara Internusa (BMI)

Japan
- Ajinomoto Co., Inc
- Japanese Consumers' Co-operative Union
- Nissui

New Zealand
- Mt Cook Alpine Salmon

Philippines
- Citra Mina
- General Tuna Corporation (Century Pacific Tuna)
- Socsksargen Federation of Fishing and Allied Industries, Inc.
- World Tuna Purse Seine Organization

Thailand
- Asian Alliance International Company
- Charoen Pokphand Foods Public Company Limited (CPF)
- Southeast Asian Packaging and Canning Ltd
- Thai Tuna Industry Association
- Thai Union

Vietnam
- Vietnam Association of Seafood Exporters and Producers
- Vinatuna

Americas = 18

Europe = 16

Other = 2

APAC = 24

GDST representation across the supply chain

[lists are illustrative, overlapping, and not fully inclusive]

Fishing/Farming

Ajinomoto Co., Inc.
AP2HI
Citra Mina
Fishin Company
Karoo Catch
Luen Thai Fishing Venture
Mt Cook Alpine Salmon
Nissui
Socsksargen Federation of Fishing and Allied Industries, Inc.
Tri Marine
Vinatuna
World Tuna Purse Seine Org.

Processing

AP2HI
Bomar (PT. BOGATAMA MARINUSA)
China Aquatic Products Processing & Marketing Alliance (CAPPMA)
Charoen Pokphand Foods (CPF)
Citra Mina
General Tuna Corporation
Luen Thai Fishing Venture
Nissui
PT Bumi Menara Internusa (BMI)
Southeast Asian Packaging and Canning
Thai Union
Tri Marine
Vietnam Association of Seafood Exporters and Producers

Export/Import

Additional Processing and Distribution

178 Degrees
A. Espersens A/S
Ajinomoto Co., Inc
Envisible
Fishin Company
Intercity Packers Meat & Seafood
Lyons Seafood
New England Seafood
Nissui
Orca Bay
Santa Monica Seafood
Seacore
Sea Delight
Silver Coast Foods LLP
Stavis Seafoods
Thai Union
Young's Seafood Ltd

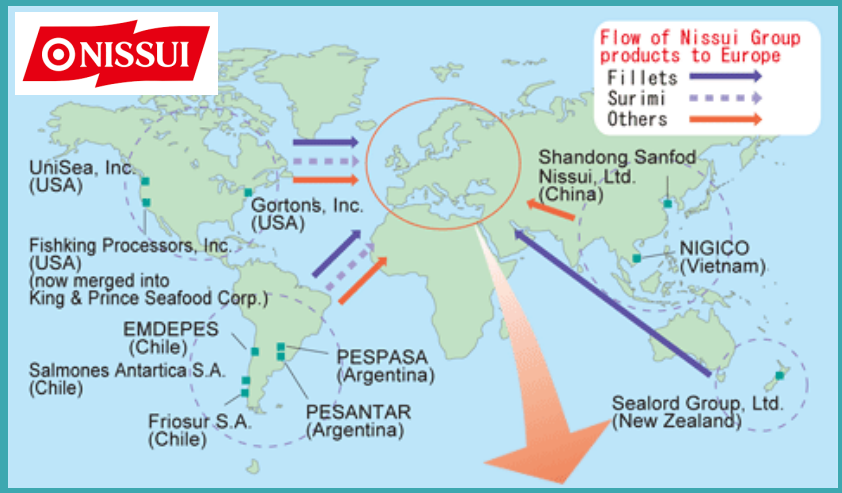
Major Brands

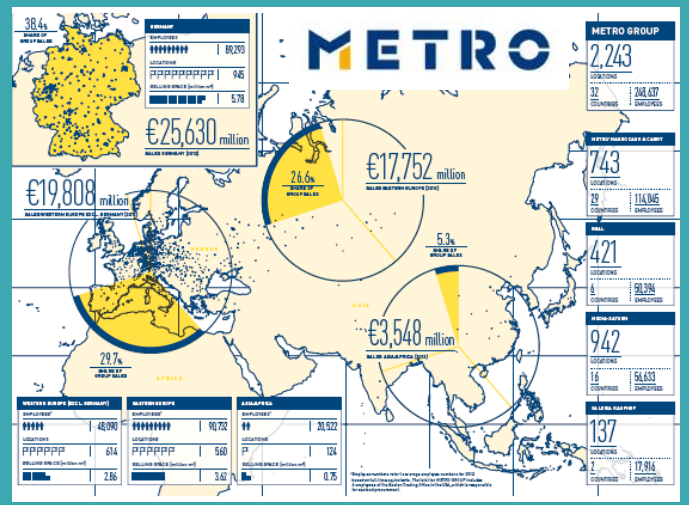
Bolton Foods
Bumble Bee
Century Tuna
Charoen Pokphand Foods
Citra Mina
Co-op UK
Fishin Company
Nissui
Santa Monica Seafood
Seachill
Seacore
Stavis Seafoods
Thai Union
Young's Seafood Ltd

Retail / Food Service

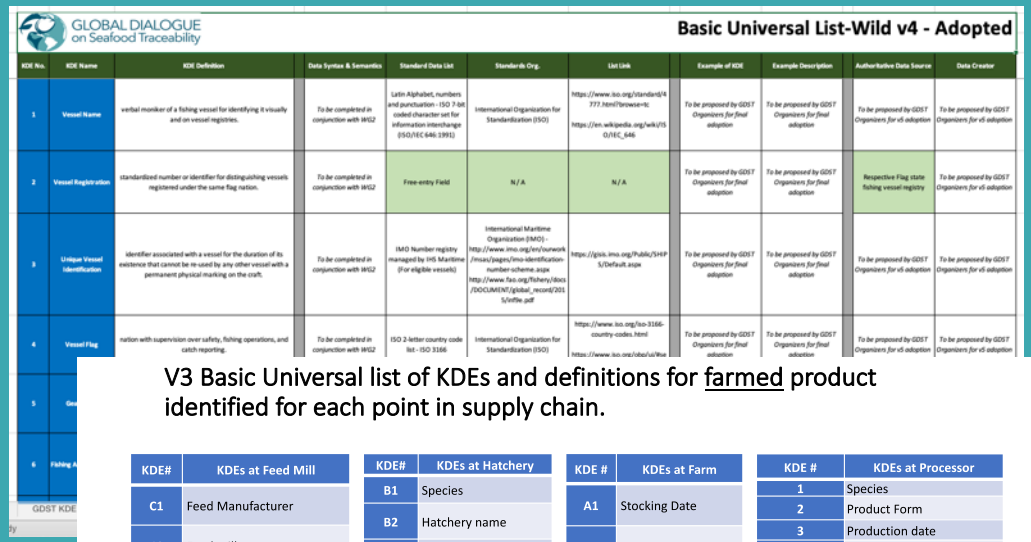
Ahold Delhaize
Aldi Nord
Co-op UK
Hong Kong Exhibition Centre
Japanese Consumers' Co-op Union
Lidl Stiftung & Co. KG
Metro
Morrisons Supermarkets
Publix Super Markets, Inc.
Sainsbury's Supermarkets Ltd
Sysco Corp
Target
Tesco
Wegmans
Whole Foods
Woolworths Group

Including enterprises at all scales -- small, medium, & large





GDST Outputs: "Ready to Use" Standards



V3 Basic Universal list of KDEs and definitions for farmed product identified for each point in supply chain.

KDE#	KDEs at Feed Mill
C1	Feed Manufacturer
C2	Feed mill name
C3	Feed mill ID
C4	Feed mill Location
C5	Major Feed ingredients
C6	Code of Good Practice (COGP)
C7	Feed Linking KDE

KDE#	KDEs at Hatchery
B1	Species
B2	Hatchery name
B3	Hatchery ID
B4	Hatchery country
B5	Hatchery location
B6	Harvest date per tank
B7	Source of brood stock
B8	Code of Good Practice (COGP)
B9	Hatchery Linking KDE

KDE #	KDEs at Farm
A1	Stocking Date
A2	Date of Harvest
A3	Farming method
A4	Feed Manufacturer
A5	Hatchery Name
A6	Hatchery ID
A7	Farm Linking KDE

KDE #	KDEs at Processor
1	Species
2	Product Form
3	Production date
4	Processor Linking KDE
5	Processor Name
6	Processor ID/License
7	Product Origin
8	Weight / Quantity
9	Unit of Measure
10	Item / SKU / UPC / GTIN
11	Farm Name
12	Farm ID
13	Farm Country
14	Farm Location
15	Aggregator Name
16	Aggregator ID/License
17	Code of good practice

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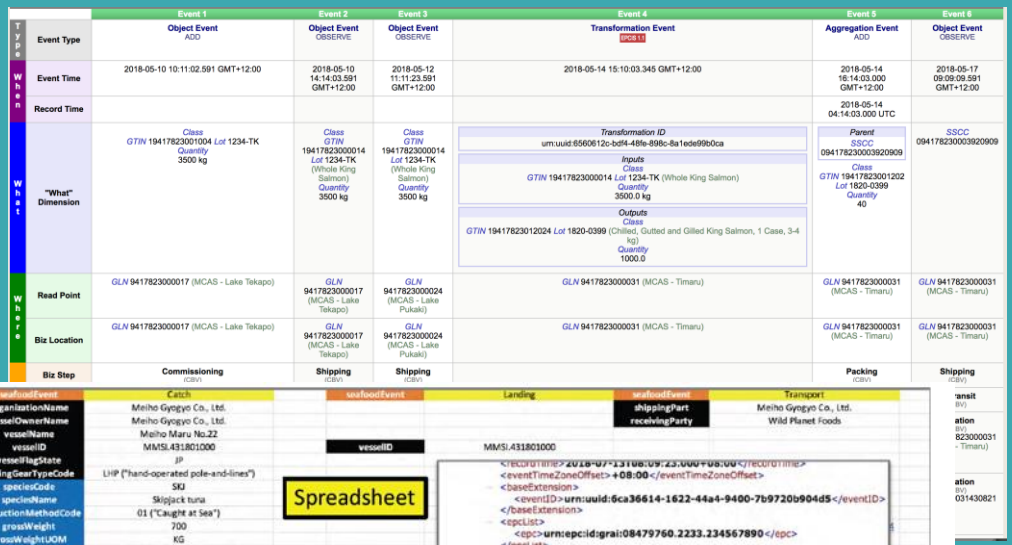


Key Data Elements ("KDEs")

= "What?"

IT Interoperability Standards

= "How?"

GDST 1.0 Standards and Guidelines

What “interoperability” means in practice

- Interoperability means
  - Speaking the same language, understanding the same words
  - Answering the same questions
  - Sharing information without re-inventing the wheel

- Data
  - Demanded uniformly
  - Named consistently
  - Provided verifiably

- IT Connections
  - Predictable formats
  - Flexible platforms
  - Controlled easily

➔ KDEs/CTEs + IT interoperability standards

- Interoperability does NOT mean
  - “One size fits all”
  - Universal access to data
  - Loss of confidentiality or control

GDST KDEs (wild capture list shown here)

VESSEL MASTER DATA
Vessel Name
Vessel Registration
Unique Vessel Identification
Public Vessel Registry Hyperlink
Vessel Flag
Availability of Catch Coordinates
Satellite Vessel Tracking Authority
Transshipment Vessel Name
Transshipment Vessel Unique Vessel Identification
Transshipment Vessel Flag
Transshipment Vessel Registration
CERTIFICATIONS AND LICENSES
Fishing Authorization
Harvest Certification
Harvest Certification Chain of Custody
Transshipment Authorization
Landing Authorization
Existence of Human Welfare Policy
Human Welfare Policy Standards
TRACEABLE OBJECT INFORMATION
Species
Product Form
Item / SKU / UPC / GTIN
Linking KDE (batch, lot or serial number)
Weight or Quantity
Unit of Measure
TECHNICAL

TECHNICAL
Event ID
Event Date, Time & Time Zone
Event Read Point (Geo Location)
Product Ownership
Information Provider
CATCH DATA
Catch Area
Fishery Improvement Project
Vessel Trip Dates
Date(s) of Capture
Gear Type
Production Method
TRANSSHIPMENT DATA
Transshipment Location
Dates of Transshipment
LANDING DATA
Landing Location
Dates of Landing
PROCESSING DATA
Expiry / Production date
Product Origin

Chosen to ensure legal origin and support CSR policies on sustainability and human welfare

Defining Key Data Elements

KDE Standards Include:

- Determining scope / basic contents (what is on the list)
- Nomenclature (common vocabulary)
- Detailed definitions
- Agreeing data formats
- Agreeing “authoritative sources” for information quality
- (KDEs) and who/where they enter the system

→ KDE/CTE matrix (CTE= Critical Tracking Events)

Key Data Elements
(KDEs)

+

Critical Tracking Events
(CTEs)

Wild Caught KDEs	CTE						
	Catch	On Vessel Processing	Transshipment	Landing	Pack/Unpack	Ship/Receive	Processing
VESSEL MASTER 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 Identification			X				
Transshipment Vessel Flag			X				
Transshipment Vessel Registration			X				
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
TECHNICAL							
Event ID	X	X	X	X	X	X	X
Event Date, Time & Time Zone	X	X	X	X	X	X	X
Event Read Point (Geo Location)	X	X	X	X	X	X	X
Product Ownership	X	X	X	X	X	X	X
Information Provider	X	X	X	X	X	X	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

(CTEs assign responsibility for data capture)

To enable
“event-based” traceability

Event-Based Traceability:

- Divides supply chains into series of “events” at which data must be captured
- Product is identified at each event in lots that can be combined or disaggregated into other lots
- General types of events (in non-technical terms) include making, aggregating, disaggregating, transforming, and using/disposing
- Data is captured at each event in common vocabularies and formats
- Traceability is achieved by linking a continuous series of events

GDST 1.0 is based on GS1 EPCIS

event-based traceability

EPCIS is by far the most widespread and well-developed approach to event-based traceability available globally.

GDST 1.0 is based on GS1 EPCIS event-based traceability

- Advantages of EPCIS
  - The most widespread and well-developed approach available globally
  - Linked to GS1 bar codes and to GS1's "object and location identifiers" used widely, esp. by retailers
  - Supported by the GS1 global network of organizations and partners

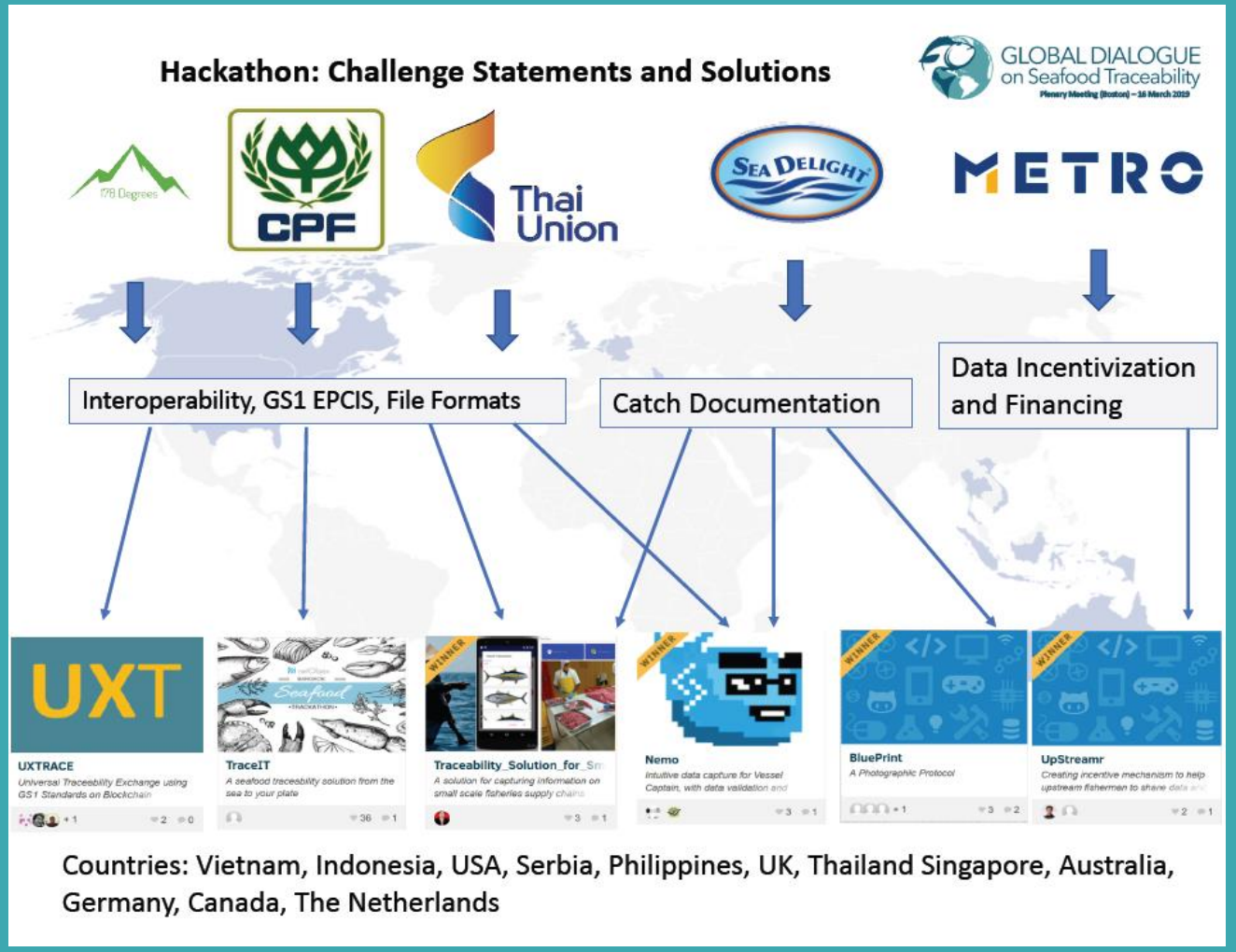
- But GDST's innovative approach does NOT require the use of GS1 proprietary identifiers

➔ GDST allows integration with world's leading event-based traceability standard system but protects independence and commercial freedom

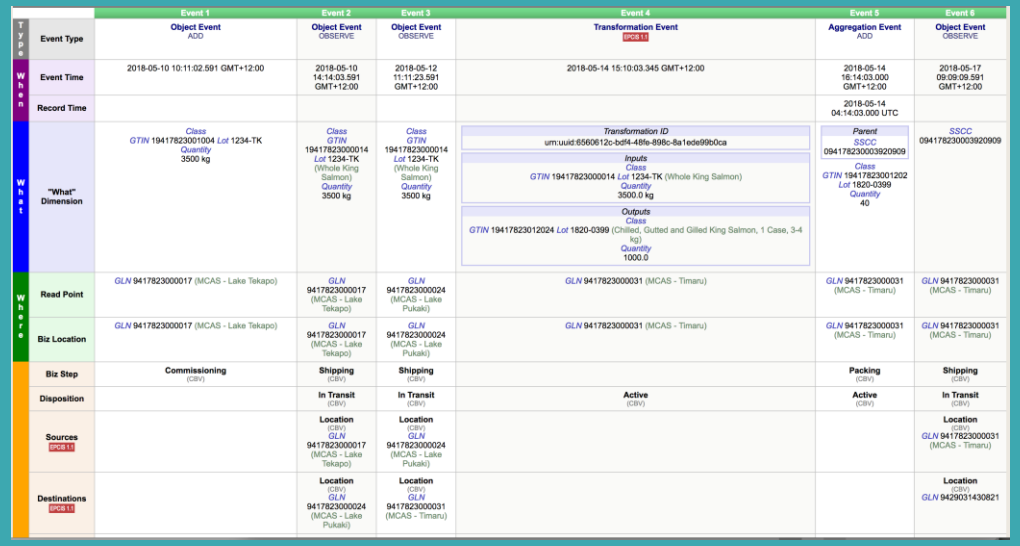
IT Guidance: Digital Interoperability

Designed for Multiple Use Cases:

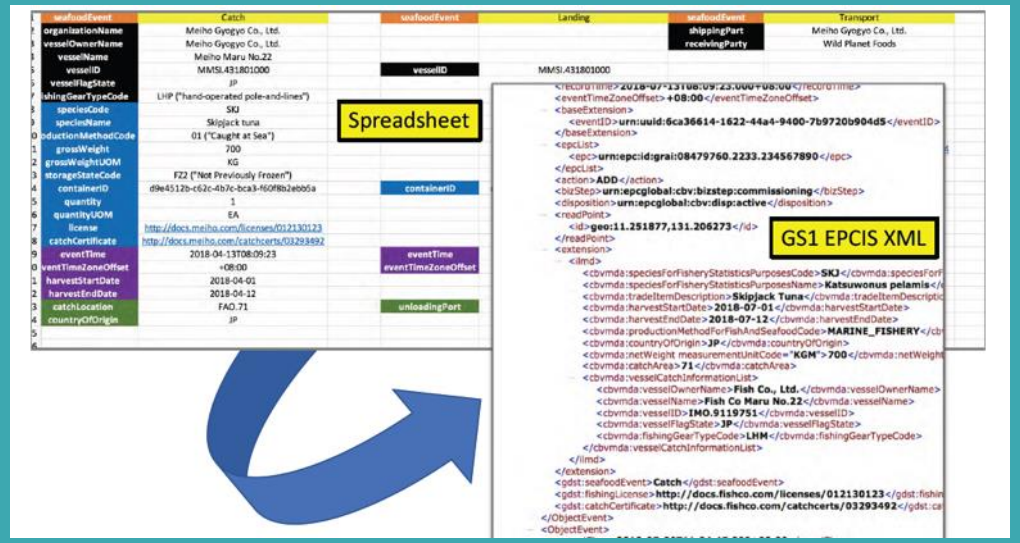
- Enabling interoperable digital data capture on small scale vessels
- Linking case/pallet identifiers with downstream systems
- Linking GS1 with non-GS1 systems
- Ensuring blockchain pilots are not siloed
- Linking legacy systems and new web and blockchain systems
- Enabling digital Chain of Custody certification
- Matching labeling requirements with inputs from suppliers



IT Guidance: Digital Interoperability



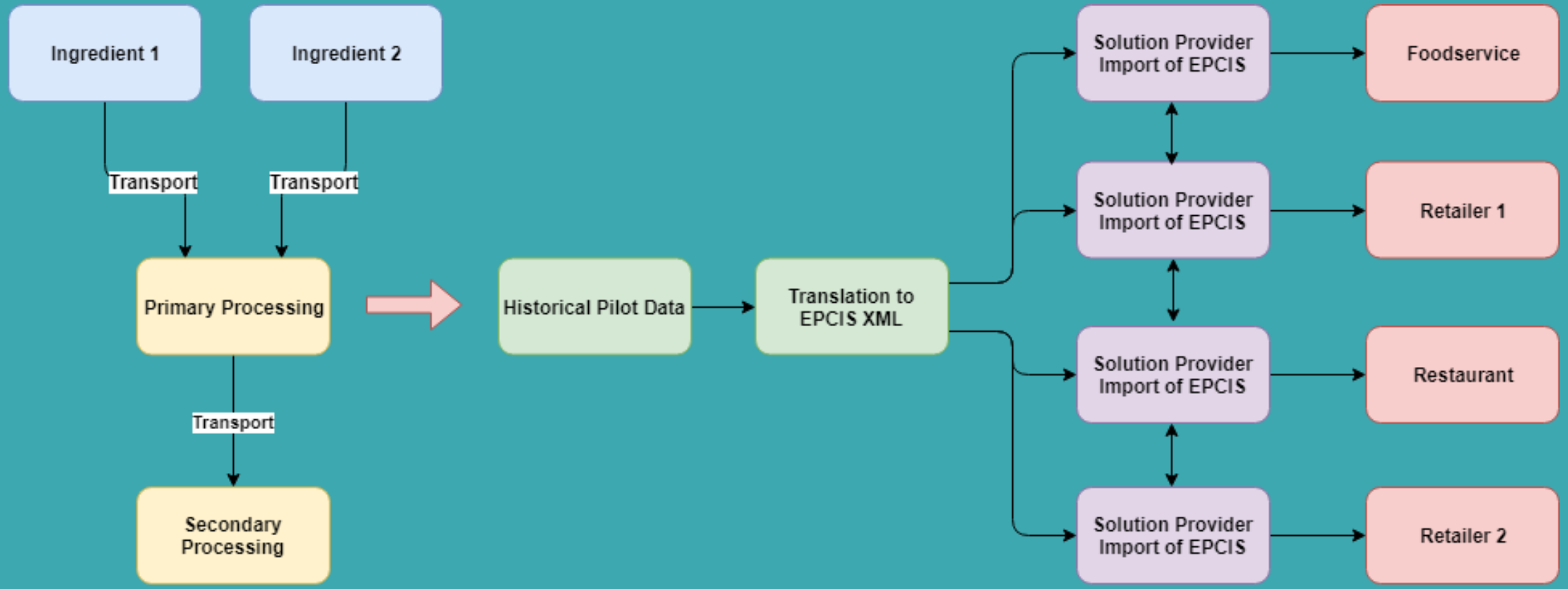
		Event 1	Event 2	Event 3	Event 4	Event 5	Event 6
Type	Event Type	Object Event ADD	Object Event OBSERVE	Object Event OBSERVE	Transformation Event IPC8.11	Aggregation Event ADD	Object Event OBSERVE
When	Event Time	2018-05-10 10:11:02.591 GMT+12:00	2018-05-10 14:14:03.591 GMT+12:00	2018-05-12 11:11:23.591 GMT+12:00	2018-05-14 15:10:03.345 GMT+12:00	2018-05-14 16:14:03.000 GMT+12:00	2018-05-17 09:09:09.591 GMT+12:00
	Record Time					2018-05-14 04:14:03.000 UTC	
What	"What" Dimension	Class GTIN 19417823001004 Lot 1234-TK Quantity 3500 kg	Class GTIN 19417823000014 Lot 1234-TK (Whole King Salmon) Quantity 3500 kg	Class GTIN 19417823000014 Lot 1234-TK (Whole King Salmon) Quantity 3500 kg	Transformation ID urn:uuid:6560612c-bdf4-48fe-898c-8a1ede99b0ca; Inputs Class GTIN 19417823000014 Lot 1234-TK (Whole King Salmon) Quantity 3500.0 kg; Outputs Class GTIN 19417823012024 Lot 1820-0399 (Chilled, Gutted and Gilled King Salmon, 1 Case, 3-4 kg) Quantity 1000.0	Parent SSCC 094178230003920909; Class GTIN 19417823001202 Lot 1820-0399 Quantity 40	SSCC 094178230003920909
Where	Read Point	GLN 9417823000017 (MCAS - Lake Tekapo)	GLN 9417823000017 (MCAS - Lake Tekapo)	GLN 9417823000024 (MCAS - Lake Pukaki)	GLN 9417823000031 (MCAS - Timaru)	GLN 9417823000031 (MCAS - Timaru)	GLN 9417823000031 (MCAS - Timaru)
	Biz Location	GLN 9417823000017 (MCAS - Lake Tekapo)	GLN 9417823000017 (MCAS - Lake Tekapo)	GLN 9417823000024 (MCAS - Lake Pukaki)	GLN 9417823000031 (MCAS - Timaru)	GLN 9417823000031 (MCAS - Timaru)	GLN 9417823000031 (MCAS - Timaru)
	Biz Step	Commissioning (CBV)	Shipping (CBV)	Shipping (CBV)		Packing (CBV)	Shipping (CBV)
	Disposition		In Transit (CBV)	In Transit (CBV)	Active (CBV)	Active (CBV)	In Transit (CBV)
	Sources IPC8.11		Location (CBV) GLN 9417823000017 (MCAS - Lake Tekapo)	Location (CBV) GLN 9417823000024 (MCAS - Lake Pukaki)			Location (CBV) GLN 9417823000031 (MCAS - Timaru)
	Destinations IPC8.11		Location (CBV) GLN 9417823000024 (MCAS - Lake Pukaki)	Location (CBV) GLN 9417823000031 (MCAS - Timaru)			Location (CBV) GLN 9429031430821



Big Picture:

- One design for multiple use cases
- Creating a “free and open” solution
  - Vendor and platform neutral
  - GDST → open source outputs
- Based on “push” or “authorized inquiry” solutions
  → enabling transparency w/o mandating it
- Applicable across different data-sharing architectures

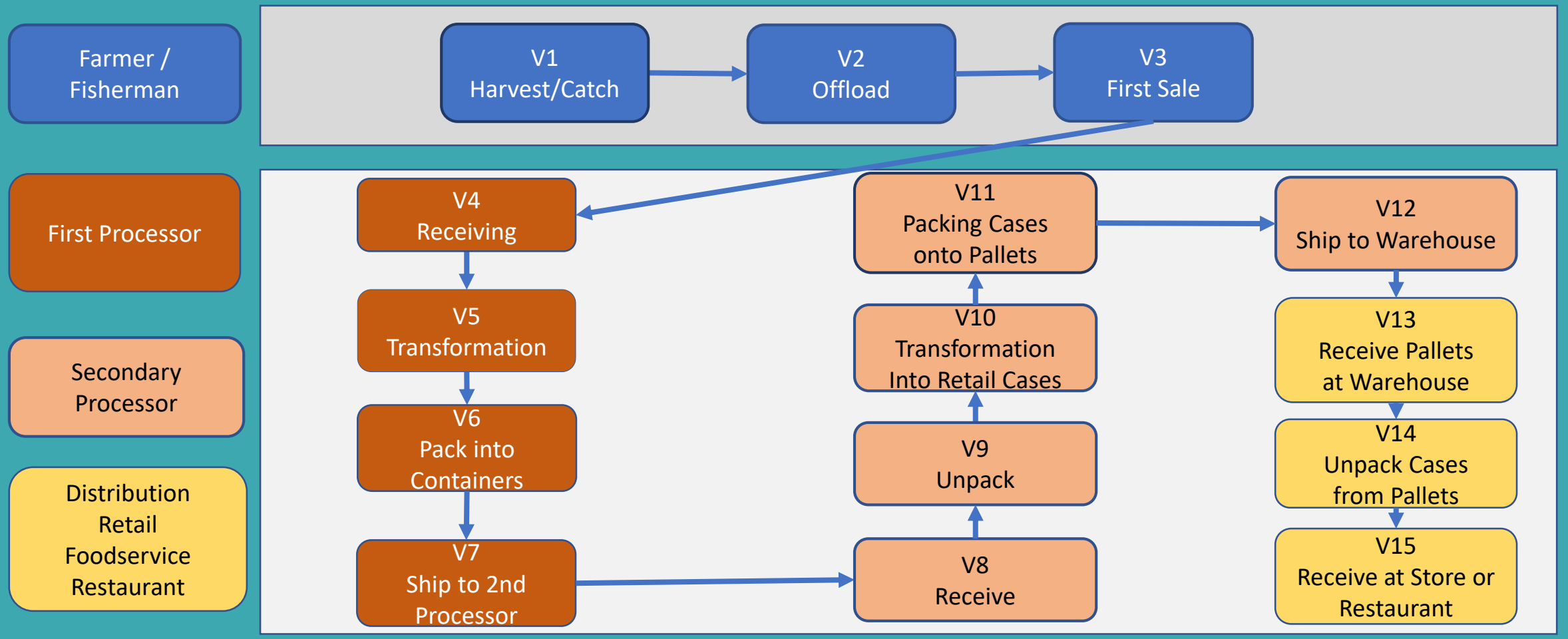
End-to-End Traceability Interoperability Pilots



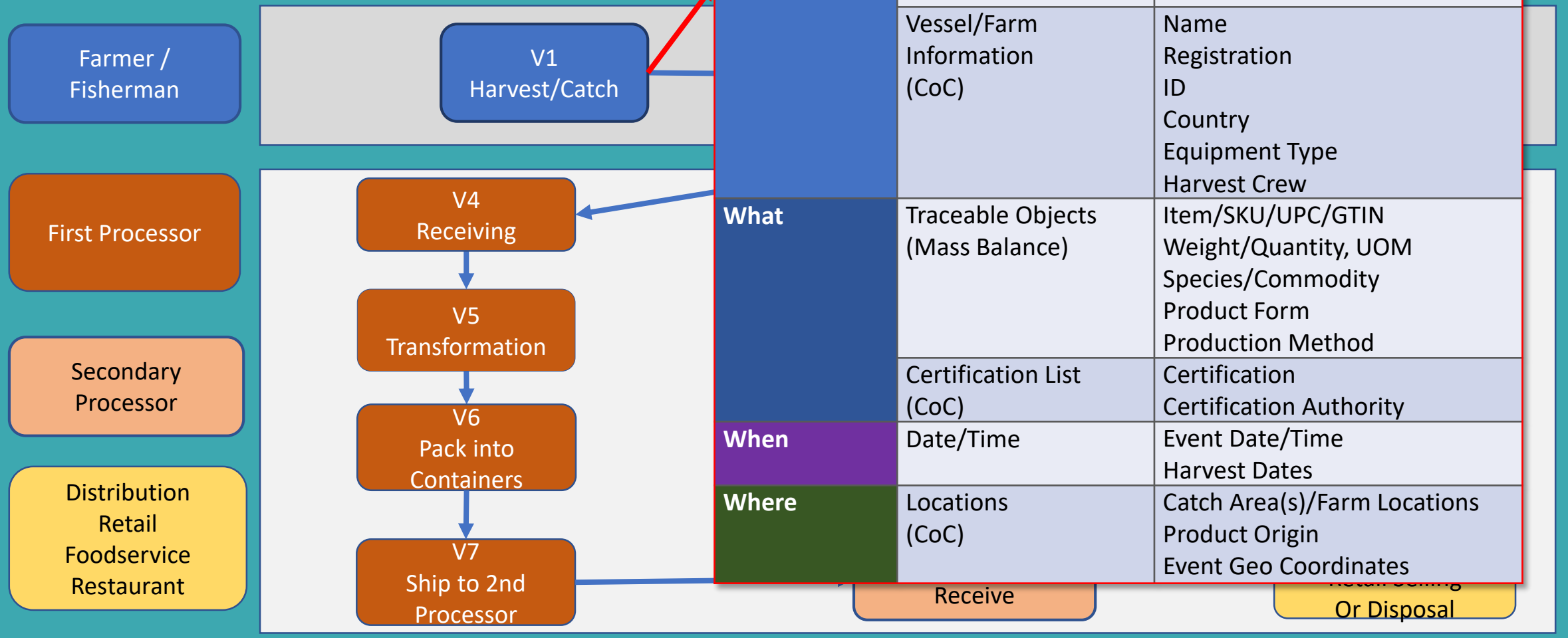
GFTC Role	Data Collection of Supply Chain KDEs/CTEs (Simplified Example Shown)	Data Conversion	Interoperability Testing Downstream from Processing

GLOBAL DIALOGUE on Seafood Traceability

Simplified Generic Supply Chain CTE Model

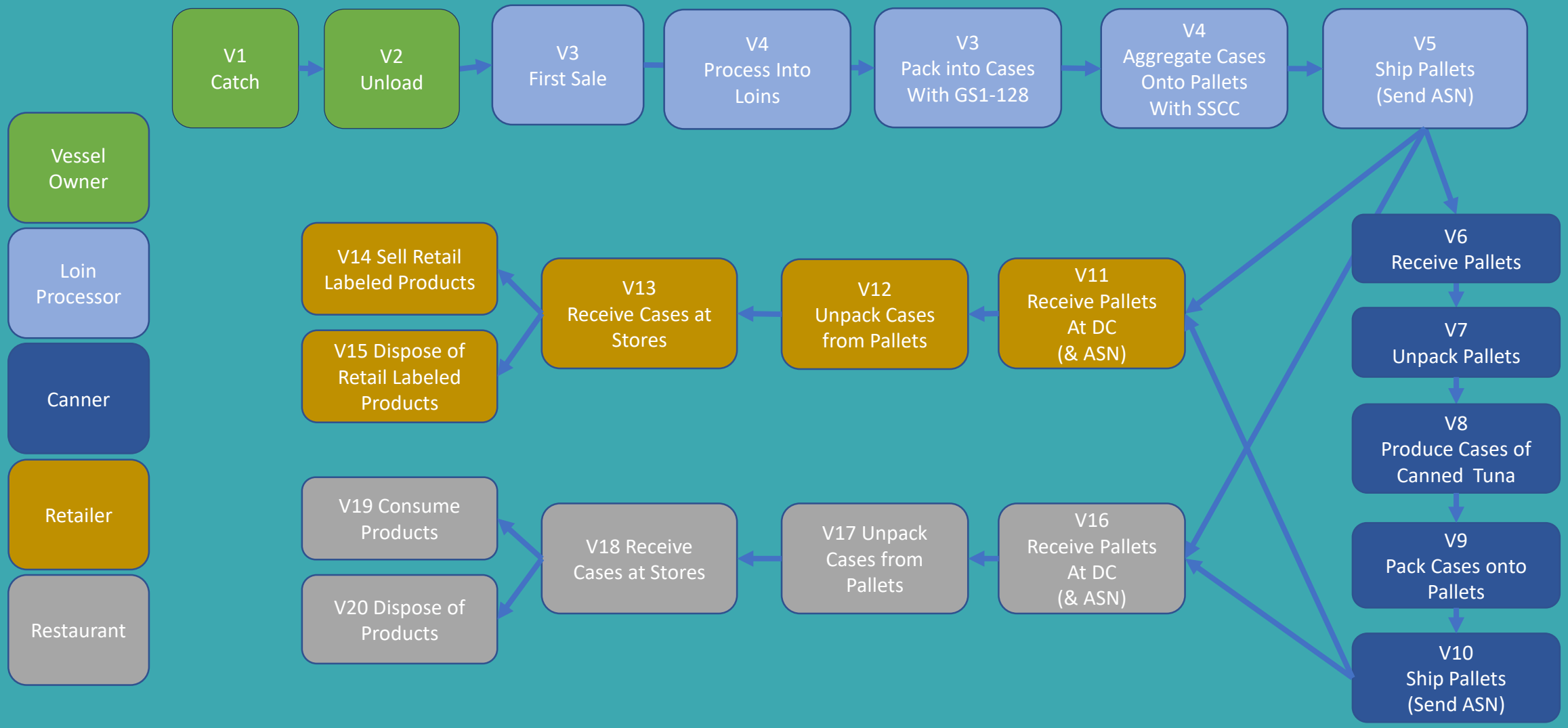


KDE Model



	Category	Key Data Element
Why	Event Type Business Step Disposition	Object Commission Active
Who	Ownership	Farm/Vessel Ownership
	Vessel/Farm Information (CoC)	Name Registration ID Country Equipment Type Harvest Crew
What	Traceable Objects (Mass Balance)	Item/SKU/UPC/GTIN Weight/Quantity, UOM Species/Commodity Product Form Production Method
	Certification List (CoC)	Certification Certification Authority
When	Date/Time	Event Date/Time Harvest Dates
Where	Locations (CoC)	Catch Area(s)/Farm Locations Product Origin Event Geo Coordinates

Example Event Flow: Canned Tuna



Release of GDST 1.0 is coming soon

Bottom Line

- **Read-to-use technical standards supporting interoperability and verifiability**
- **Based on but not slave to the leading event-based standard (EPCIS)**
- **Standardizing data and formats but platform and architecture neutral**

GLOBAL DIALOGUE
on Seafood Traceability

Formal release at SENA ‘20 (Boston)
March 16

The industry-wide benefits of GDST 1.0 depend on broad adoption by companies like yours and others across the supply chain

Learn more . . . and then get on board!