

UN/CEFACT Smart Container Project Status Update

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Jaco Voorspuij;
Senior Manager Transport & Logistics; GS1

Michael Schröder;
Project Manager eSolutions ; Hapag-Lloyd



Agenda

- Brief history
- Participation
- What are these Smart Containers?
- Where do they fit?
- What have we added?
- Where can you find what's been delivered?
- What are we working on?
- How can we drive rapid and wide adoption?

Brief History

- October 2017:
Kick-off of the Project
Start working on White Paper for Smart Containers
- 2019:
White Paper for Smart Containers published
Business Requirements Specification for Smart Containers started;
published September 2019
Started work on additions to UN/CEFACT **Core Components Library** and
Multi Modal Transport Reference Data Model
- 2020:
Additions incorporated in Release D.20A;
Delivered code lists for new data-elements

Participation



Large group of experts from a wide range of backgrounds

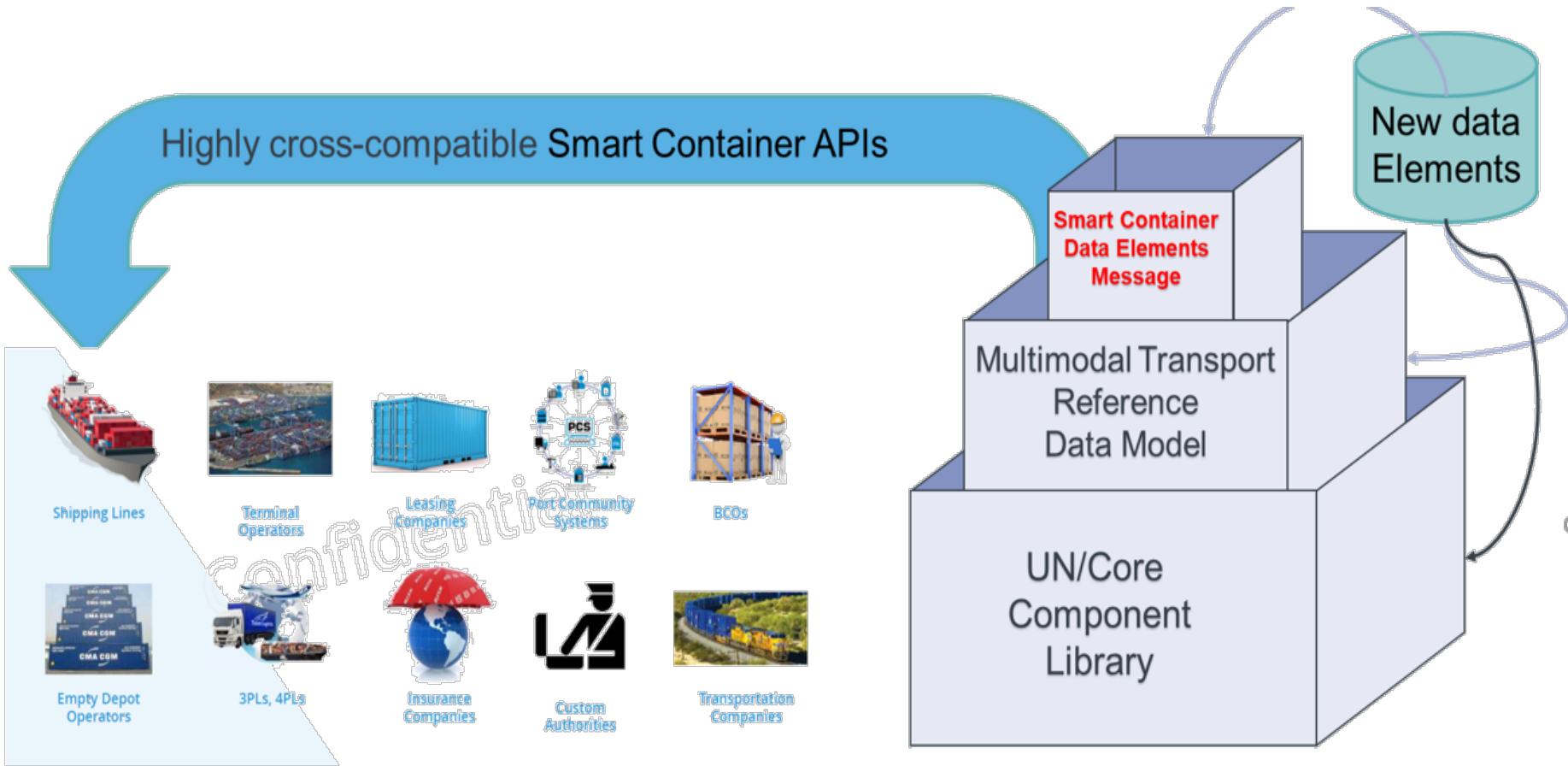
- Shipping Lines: CMA CGM, MSC, Metro Shipping, Hapag-Lloyd
- Governments: Brazil, France, Australia, USA, Italy
- Freight Forwarders: Cargomind, FIATA
- Ports: Rotterdam, Le Havre
- Solution providers: Traxens, Globetracker, Nexxiot
- Software Providers: MarineTraffic
- Consultants: 51biz, pipex, CIF consulting, Port Expertise, Nextrade, Paradigma
- Standardisation: GS1, BIC, IATA



What is this Smart Container?

- A smart container is “a container equipped with an IoT” device.
- An IoT device in this context is any device that takes measurements that may be used to determine the condition of the cargo or the environment around the cargo, and is able to communicate with the outside world
- The BRS focusses on the intermodal container but the concepts and processes described will also largely apply for any type of container e.g. ULD in Air cargo
- The BRS describes 22 Use Cases (covering all currently common practices) that may benefit from using smart container standards
- The BRS is the basis for information exchange standards to be used for smart container data (now included in Release 20A)
- The new UN/CEFACT smart container standards build on existing standards

Where does Smart Container fit?



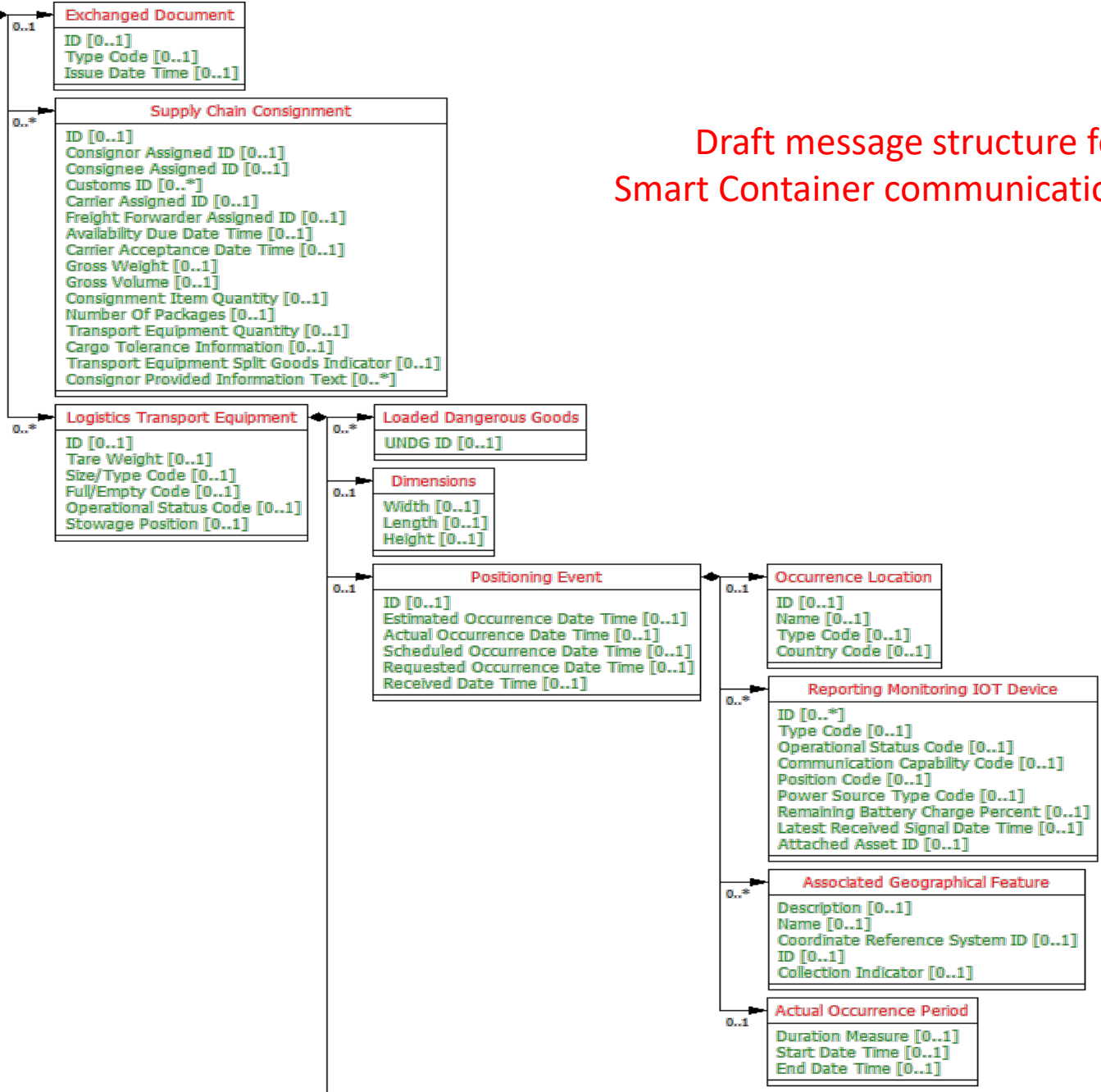
UN / CEFACT

What has been added to the CCL and MMT data model?

- Sensor related data-elements and classes
- Geographical information data-elements and classes
- A total of approximately
 - 120 additions to the CCL;
 - 6 changes to existing entities (related to geographical objects)
- Linking to MMT entities like Consignment and Transport Equipment
- Code Lists for new CCL data-elements covering **both refrigerated and dry containers**



Draft message structure for Smart Container communication



Code Lists

- Some new data-elements require relevant code lists are used for them
 - Sensor category, Reefer data, Sensor type, Device type, Power source type, Device communications capability, Device certification type, Location source, Device and Sensor positions, Device status, Event code, Occurrence location type

01 Sensor Category | **Reefer Data** | **02 Sensor Type** | 03 Device Type | 04 Power Source Type | 05 Device Comm capability

06 Device Certification type | 07 Device+Sensor Position | 08 Device Status | 09 Location source | 10 Event Code | **11 Occurrence Loc Type**

Code List Description	It describes the type of a sensor in a smart container. It covers the different sensors having the ability to measure a particular physical parameter	
based on	new UN/CEFACT code list	
Sensor Type Code	Sensor Type	Description
LOC	Location	A sensor that measures location information : Latitude, Longitude
TMP	Temperature	A sensor that measures temperature
HUM	Humidity	A sensor that measures humidity
ACC	Accelerometer	A sensor that is used to represent a 1-3 axis accelerometer (shock and vibration)
LUM	Light Meter	A sensor that measures light (can be used for door opening detection)
MAG	Magnetometer	A sensor that is used to represent a 1-3 axis magnetometer with optional compass direction (orientation)
PRS	Pressure	A sensor that measures pressure (Gas, Liquid, Atmosphere, barometric...)
VOL	Voltage	A sensor that measures power supply voltage (Volt)
CUR	Current	A sensor that measures power supply current (Amps)
PER	Transducer	A sensor that reports measurements on a 0-100% scale
CON	Concentration	A sensor that measures particle concentration in a medium, e.g. concentration of gases
RAD	Radiometer	A sensor that measures radiation
DOR	Door	A sensor that determines door opening status
HEA	Infrared heat	A sensor that determines heat signatures
MTN	Infrared motion	A sensor that detects motion withinin the container



Acknowledgements

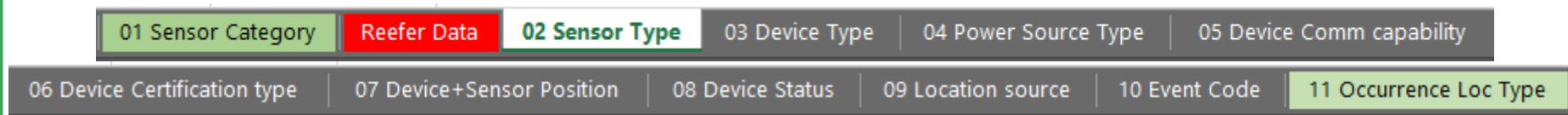
- UN/CEFACT highly appreciates the contributions of all experts participating in the Smart Container project.
- We owe special thanks to below participants who really did a formidable job in delivering content and ensuring the project continued to move forward even when that was difficult:
 - Hanane Becha (previous Lead now Vice-Chair T&L domain),
 - Todd Frazier
providing multi-modal perspective, balancing maritime perspective.

Where to find the standards delivered?

- White paper on Smart Containers
http://www.unece.org/fileadmin/DAM/cefact/GuidanceMaterials/WhitePapers/WP-SmartContainers_Eng.pdf
- Business Requirements Specification
https://www.unece.org/fileadmin/DAM/cefact/brs/BRS-SmartContainer_v1.0.pdf
- Updates to Release 20A Core Component Library and Reference Data Model Multi Modal Transport
https://www.unece.org/cefact/xml_schemas/index
<https://www.unece.org/fileadmin/DAM/uncefact/CCL/CCL20A.zip>

Following up on achievements

Engaging with industry organisations to enhance the code lists



Validating the new standards in actual implementations.
Creating awareness as first step towards that goal.

Creating awareness – Driving adoption

Articles in (industry) publications

Smart Maritime Network

- [Standards-based Smart Container Solution is key for supply chain shared visibility](#)
- [Smart containers and the data-driven supply chain](#)
- [The cargo owner's case for smart containers](#)

rtinsights.com

- [UN/CEFACT Data Exchange Standards for Smart Containers](#)

Maritime Executive

- [Smart Containers and Situational Awareness](#) (also on ResearchGate)
- [Digital Twins for the Maritime Sector](#) (also on Smart Maritime Network)

Others

- [Visibility providers develop smart container data standard](#) (joc.com)
- [UN publishes standards for smart container data collection](#) (Transglobalexpress)
- [New standards published to advance the use of data from smart containers](#) (theloadstar.com)
- [Standardization and containerization in the digital world](#) (shortseashipping.eu)
- [The UN/CEFACT Smart Container Project](#), Becha H. (2020c) in *The magazine of international Institute of Marine Surveying, issue 91, March 2020*
- **Global Data Exchange Standards: The Basis for Future Smart Container Digital Services**, Becha H., Schroeder M., Voorspuij J., Frazier T., Lind M. (2020), in *Maritime informatics. Heidelberg: Springer*.
- [The UNECE Trade Facilitation White Paper on Real-time Smart Container data for supply chain excellence](#)



Questions and Answers

Thank you for your attention

CONTACT

For more information

- **UN/CEFACT Web site**
<https://uncefact.unece.org/display/uncefactpublic/Smart+Containers>
- **Jaco Voorspuij, Project Lead**
Jaco.voorspuij@gs1.org
- **Michael Schröder, Editor**
Michael.Schroeder@hlag.com
- **Lance Thompson, UN/CEFACT – UNECE- Secretary**
lance.thompson@un.org

