Achieving Traceability in International Supply Chains

UN/CEFACT Supply Chain Cross-Industry Track & Trace project

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Transparency in Supply Chain

Innovation & Standards are needed to increase the efficiency, resiliency and sustainability of logistics!

Smart containers

- Physical reliable data for end-to-end visibility
- UN/CEFACT Smart container project achievements

Cross industry Multimodal Track & Trace

- Track & Trace beyond a single mode of transport
- UN/CEFACT Supply Chain Cross-Industry Track & Trace project

Avoid Paving the Cow

Business process should not be automated as it is BUT should be rethought first to enhance its effectiveness and efficiency!!
Transparency
Multimodality
Interoperability
Collaboration
Standards

Transition from the standards adopted by individual transport modes to multimodal efforts standards organizations

Information is searchable, available, and interpreted the right way

This article is a follow-up to two earlier pieces, produced largely by the same authors, outlining the development of semantic and technical interoperability in digitising global multimodal supply chains.

By Honane Becha, Todd Frazier, Michael Schröder and Jaco Voorspuij

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The mission of this project: Where is the product at any time?

- Enable tracking and tracing of products (or assets) and information sharing in *standard* electronic format.
- Define *use cases* to explain the data that will be generated and captured concerning products or other traded items (e.g., lots).
- Track and trace any *traded and identified items* including transport equipment or assets (e.g., box, pallet, container, etc. ... Even empty!).
- Logistic services: transport the traded goods between the *seller* and the *buyer*. 
Track & Trace Project
Current Status and Deliverables

• Information gathering phase: Green Paper compiling concepts, scenarios, and use cases for all primary modes of transport - has been completed (82 pages)

**Formal DELIVERABLES of the project:**

• White Paper: “*Integrated Track and Trace for Multi-Modal Transportation*” presented to the 27th UN/CEFACT Plenary in April 2021

• Business Requirements Specification (BRS) detailing the Business Processes of Cross Industry Track and Trace

• Message structures (as class diagrams) for the business transactions and XML Schemas
Tracking & Trace Methods

• Traditional tracking methods – manual and automated
• Automated Identification and Data Collection (AIDC) methods
  • Radio Frequency Identification Technology (RFID-based tracking)
  • Optical Character Recognition Technology (OCR-based tracking)
• Global Positioning System using Internet of Things (IoT) telematics devices (GPS-based tracking)

Note. The environmental parameters captured by smart containers are not part of the T&T project
What is a Smart Container?

- A smart container is "transport equipment outfitted with an IoT" device.
- Any Transport Equipment could become Smart asset
- Takes measurements and communicates with the outside world
  *where is my container? Conditions of my goods?*
- No single player of the logistic chain has a granular door-to-door overview
- Evidence of the physical trip execution
- Delineation of the responsibilities of the different players
- Good candidate for *Data Pipelines*
Smart Container Data Flow

- Communication technology
  - Data flow
  - Control flow

- Data sharing environments
  - Data flow
  - Control flow

- Domain applications

Smart container device with sensors for:
- Location (GPS)
- Motion and shocks
- Door opening
- Ambient temperature
- Inside temperature
- Inside humidity

Container
The power of Smart Containers

Going beyond business as usual

- Regular events versus significant alerts..
- Predictive services
Digital Twin for well-informed decision making

“A digital twin is a dynamic digital representation of an object or a system... Representation of the physical world in the digital space.”
Multiple Digital streams to enhance the transparency
The smart container: The new actor in the Supply Chain

Standardized Smart Container data is key to smart Supply Chain
Electronic record of data about the goods and movement built up from the supply chain
Data can be provided in ‘snippets’ at various waypoints
The person who knows the information to be true should provide the data
Those who need the information should have access to those data fields to perform their role
Key take away messages

• Logistics industry is *essential* for the world economy
• Logistics industry is a *fragmented* self-organized ecosystem
• Digital Data Streams (DDS) are important for a better *context awareness* and *decision making*
• *Track & Trace Standards can* enable multimodal transparency
• Smart Containers *complete the missing* link offering an end-to-end visibility
• Innovation is needed to enhance *predictability* and *efficiency*
• Standards secure investments and facilitate integration of DDS
• Collaboration of all actors is needed for *resilient eco-friendly* supply chain
Thank you

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