AN INITIAL VERSION OF A FEDERATED INFRASTRUCTURE IMPLEMENTING THE GLOBAL DATA PIPELINE

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WCO - RESEARCH TRACK, OCTOBER 2015
TRADER INTEROPERABILITY INCREASE DATA QUALITY REQUIRED FOR IMPROVED RISK ANALYSIS
VISION

LIKE THE INTERNET: "REGISTER, CONNECT, AND COLLABORATE WITH ALL OTHERS" (SEAMLESS INTEROPERABILITY)
THE CURRENT APPROACH DOES NOT WORK!

- Interoperability Total Cost of Ownership (TCO) too high
  - Specification and implementation of Implementation Guides (IGs) with new/existing business partners
  - Maintenance of IGs
  - EDI: mature technology in its final lifecycle stage
  - Difficult for SMEs to become involved

- Closed communities
  - Sufficient (open) standards
  - Bilateral or multilateral IGs

- Current interoperability technology used by business and government is a barrier to improve data quality by full trader interoperability
### WE ARE NOT ADDRESSING ALL REQUIREMENTS!

<table>
<thead>
<tr>
<th>Concept</th>
<th>Supply &amp; Logistics innovation</th>
<th>Interoperability solution</th>
<th>Pro</th>
<th>Con</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>Visibility</td>
<td>Active: events with REST APIs, sensors/IT systems</td>
<td>Timeliness</td>
<td>No comprehensive overview of applications, no standard, data governance</td>
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<td>Compliance</td>
<td></td>
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<tr>
<td>Capacity sharing/bundling</td>
<td>Passive: messaging</td>
<td>Existing technology</td>
<td></td>
<td>Idem and low velocity, closed systems, high TCO, barriers</td>
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<tr>
<td></td>
<td>Sensor data (IoT)</td>
<td>Low volatility</td>
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<tr>
<td>Decision Support</td>
<td></td>
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<tr>
<td>Action (state change)</td>
<td>Change physical state</td>
<td>Human instruction (smart app?), actuator (IoT)</td>
<td></td>
<td>Proprietary standards</td>
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<tr>
<td>Governance and inspection</td>
<td>Messaging</td>
<td>Existing national declaration messages</td>
<td></td>
<td>Lack of data, uncoordinated (unfocused?) inspections</td>
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<td></td>
<td>Linked Data (events)</td>
<td>Low volatility</td>
<td></td>
<td>Experimental stage</td>
</tr>
<tr>
<td>Outsourcing (transactions)</td>
<td>Messaging</td>
<td>Existing technology</td>
<td></td>
<td>Closed communities, high TCO, barriers</td>
</tr>
</tbody>
</table>

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SO WE NEED A PARADIGM SHIFT: A GLOBAL LOGISTICS INTEROPERABILITY INFRASTRUCTURE!

IS THIS THE DATA PIPELINE?

AND......
LOTS OF QUESTIONS ....

What do I want to achieve?
Where can I find proper data that suits my purpose?
Do I have access to the data?
Do I trust the source/customer?
If not, can I negotiate data access?
Can I process the data?
Does the data improve my decisions and/or contribute to my business?
Does my subcontractor perform?
Does my customer really pay?
What is the quality of the data?
Should I have mechanisms in place to inform me on relevant changes, actively look for data, wait for it, and/or all mechanism?
Do I want to be sure that data is received by the proper partner?
Is the data for free?
Do I want to have proof of sharing particular data?
How can I control data sharing?
effectiveness, efficiency, or innovation by visibility
publish, search, and find; semantics
identification and authentication
trust
negotiation protocol
syntax and semantics
situational awareness and transactions
trust, performance indicators
credit check
data quality, data workflow
subscription to events, search, messages
reliability and security
accounting and billing
non-repudiation
data governance with data sharing policy
HOW CAN THESE TRANSFORM INTO INFRASTRUCTURE SERVICES?
GENERIC INFRASTRUCTURE SERVICES (SEE PAPER)

Infrastructure services

- Data security services
- Reliability services
- Data exchange services
- Data Quality Detection & Improvement
- Trust services
- Operational services
- Data sharing services
- Security (identification) services
- Monitoring services
- Non-repudiation services
- Publishing services
- Semantic services
- Supporting services
- Registration services
- Policy specification services
- TEP
- Visibility services
- Transaction Support services
- Data Collection Services
- Matching services
- Policy negotiation services
- Accounting and billing services
WHICH SOLUTION TO CHOOSE? FEDERATION BY A TRADE FACILITATION PROTOCOL

- Business Community System
- Trade Facilitation Protocol
- Logistics IT Service provider
- In-house development
- COTS (ESB)
ELEMENTS OF THE PROTOCOL

Visibility, compliance and resilience protocols
- Data policy negotiation protocol
- Profile protocol – goals and logistic services, chain composition
- Visibility protocol - events
- Transaction protocol – booking, ordering, cancellation, visibility

Data sharing protocol
- Binding negotiation – which syntax and/or Implementation Guide to use
- Data exchange – messages, APIs, events
- Reliability – resending, etc. (eFreight access point/eSens eDelivery)
- Security – data encryption (eFreight access point/eSens eDelivery)

Authentication protocol (use of different certification authorities, see Cassandra)

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...AND STILL, CONNECTION TO THE INFRASTRUCTURE NEEDS TO BE SOLVED.

THIS IS FAR TOO COMPLEX!

BACK TO CUSTOMS: OPTIONAL DUAL FILING AND MESSAGING
1. OPTIONAL DUAL FILING (DCA)

- REST API

- Trader (importer, forwarder)
  - TEP
  - MRN (opt.)
  - Event

- Platform (‘pipeline’)
  - Profile
  - Event
  - NLBB52 (MRN, B/L number, container number)

- DCA
  - ENS (MRN)

- Trader (carrier)
1. OPTIONAL DUAL FILING (DCA)

REST API

Trader (importer, forwarder)

Trader (carrier)

Registration

Platform

Data sharing (Pub/sub broker)

DCA

dashboard

decl. system

ENS

TEP

profile

event

profile

event

NLBB52

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1. OPTIONAL DUAL FILING (DCA)

REST API

Seacon

ESB (Seacon)

Trader (carrier)

DCA

profile

event

ENS

NLBB52
2. MESSAGING (PUSH) BASED PIPELINE (HRMC)

Trader (importer, forwarder) -> data (several WayPoints) -> Platform ('pipeline')

TEP -> data

HRMC

ENS

Trader (carrier)
WHAT IF THERE ARE DIFFERENT SERVICES BY DIFFERENT AUTHORITIES

Trader (importer, forwarder)

Trader (carrier)

Platform ('pipeline')

DCA

HRMC

REST API

event

data

TEP

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WHAT IF THERE ARE DIFFERENT SERVICES BY DIFFERENT AUTHORITIES

Trader (importer, forwarder)

DCA

Platform ('pipeline')

REST API

data

Trader (carrier)

profile

event

HRMC

data

ENS

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WHAT IF WE USE DIFFERENT INFRASTRUCTURES - FEDERATION

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CHALLENGES

TRADER INTEROPERABILITY: ADOPTION AND IMPLEMENTATION (STANDARD, EARLY ADOPTER, NEW ENTRANT?), AND AVAILABILITY/ACCESS TO DATA (BUSINESS CASE, ADDED VALUE, BEST PRACTICES, LAWS (UCC), EXAMPLES?)

ROLE OF AUTHORITIES: DECLARATIONS (UCC/STI), VOLUNTARILY (CORE), 10+2?
THANKS FOR YOUR ATTENTION