UN CEFACT CAPACITY BUILDING SEMINAR

SUPPORTING PILOT PROJECTS

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Executive summary

- UIC as Global Association is supporting the digital transformation of its members as enabler for improving cross border freight services
- The Freight Department offers key tools for this: support and expertise in corridor development and Raildata digital platform
- ECN is a desired use case from the market no matter the region
- We are not starting from scratch – the international community has been engaging to develop standards and implement interoperable solutions able to cater for the needs of multimodal stakeholders
- Already now, Raildata can be a partner of pilot initiatives
- Raildata is the corner stone of the digital modernisation of the sector with the DP-RAIL initiative for which a CEF application was filed in January 2023
UIC: A long history at the service of member railways and international railway cooperation

Over 200 members
- Railways
- Rail operators
- Infrastructure managers
- Railway service providers
- Public transport companies

Mission
- to promote rail transport at world level and meet the challenges of mobility and sustainable development.
UIC Freight objectives and levers

- Enhancing interoperability and capacity optimisation
- Encouraging innovation /digitisation of processes and implementation of technology game changers key to drive modal shift
- Ensure Safety & Security are kept at highest level
- All leading towards productivity enhancement
Deployment of key technologies will strongly enhance RU product quality

Impact on RU product quality

- **Transparency**
  - Improved booking of train paths ("one-stop shopping")
  - Availability of dedicated, systemized rail freight capacity
  - Seamless integration of transport chains via Digital platforms
  - Seamless Track & Trace

- **Transport time**
  - Significantly reduced transport times due to
    - Dedicated freight capacity bands with less disruptions
    - Better train paths

- **Reliability**
  - Higher punctuality
    - Less trackside signalling failures (ERTMS 3)
    - Less congestion due to significantly increased capacity
  - Better synchronisation across Europe through data transparency
  - Less dependency on critical bottleneck resources (DAC, ATO)

NOT EXHAUSTIVE
On a global level

Corridors facilitate the implementation of a «drive through philosophy»

Interconnectivity is key incl for data exchange

1) Conical projection to minimize visual distortion of distances; numbering based on route usage for Eurasian rail cargo transport
Rail operations require improved processes and infrastructure to bridge current service gaps

Focus areas for improvement of operations

**Process improvement**

**Customs harmonization**
- Unified application of CIM/SMGS across countries, good types and block and wagonload trains
- Pre-arrival customs clearance

**Process digitization**
- Acceptance of electronic consignment notes
- Digital platform for multi-stakeholder data sharing, e.g., real-time shipment monitoring
- Uniform data security standard

**Regulation standardization**
- Consistent legal requirements for rail transport across good types, incl. special goods
- Simplified regulations for transit shipments

**Multimodal connectivity**
- Increase of ferry capacities and service reliability
- Seamless integration and expansion of intermodal infrastructure at connection ports

**Inland terminal expansion**
- Construction of new intermodal dry ports at key corridor points, e.g., Kars
- Expansion of capacities (e.g., bogie supply, track equipment) at gauge change terminals
- Extension of terminals for long trains

**Network modernization**
- Electrification and installation of automated signaling systems
- Purchase of locomotives and wagons

Source: Roland Berger
Digitization and coordinated harmonization are major improvement potentials

Customs and border crossing identified as bottleneck by the market

**Key take-aways and bottlenecks**

1. **Customs** perceived to be manageable but with a lot of improvement potential
   - Number of border crossings and non-efficient customs processes as bottlenecks
   - Border crossing procedures perceived to be cumbersome but manageable by operators
     - Mostly "first time" issues or "normal" problems

2. **Lack of data digitization and CIM/SMGS harmonization complicating processes**
   - Many documents such as consignment notes and declarations still done with paper at certain borders – Time-consuming and error-prone processes
   - Common CIM/SMGS consignment note is still not accepted in some countries

3. **Suboptimal physical infrastructure at some border crossing points**
   - Lack of modern systems and qualified personnel at some customs
   - Cargo inspection difficult and time-consuming (due to trucking) if customs not integrated in terminal

4. **Rail naturally more difficult for customs due to inherent characteristics**
   - Long distance over land in the transit country mandatory for rail cargo
   - Customs mandated to conduct stricter controls for hazardous and illegal goods

Source: Expert interviews, Roland Berger
Market players have learned to perform customs reliably – Still improvement potential concerning its efficiency

Legal situation and customs: continued efforts of CIT – OSJD – UNECE and others are key
Standards developed by the community need to support multimodality and be interoperable

Current situation

• The Eurasian Silk Road spans two customs unions – EU and the Eurasian Customs Union (Russia, Kazakhstan, Armenia, Kyrgyzstan, Belarus). The lack of customs control in the latter ensures the efficient border crossing on the northern route
• The middle corridor has four border crossings that are not covered by Customs Union, and the southern corridor five (compared to two on the northern corridor)
• Customs procedures where problems tend to arise are cited to be between:
  – Turkmenistan and Iranian border (due to vested interest)
  – Baku Port (as reloading and customs cannot be parallel)
  – Georgian and Turkish border (due to issuance of new consignment note)
  – EU border entries at Polish entries other than Malaszewicze (due to lack of customs infrastructure and capabilities)
• With the introduction of CIM/SMGS common consignment note and its acceptance by China in 2017, significant time and cost savings could be achieved

Source: CIT, Expert interviews, Roland Berger
Stakeholders have been collaborating for some time

We are not starting from scratch

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**RailData:**

- is special group of the UIC, established in 1995
- develops and runs Data Exchange platforms for European freight railway undertakings
- Members/users represent over 70% of yearly ton-km in EU.

**RailData tools** are the core element for digitalization of international rail transport:

- Exchange of data about wagons position and status: ISR
- Exchange of consignment note data: ORFEUS
- Database of commercial responsible for wagons: CoReDa
- Trains and wagons handover quality management: ATTI

[https://www.raildata.coop/](https://www.raildata.coop/)
Orfeus to support ECN

ORFEUS (Open Railway Freight EDI User System) ensures the exchange of railway CIM consignment notes data between the co-operating railway undertakings (RU) using a Central Data System (CDS).

The ECN-xml message is capable to carry 100 % of consignment note data or CUV wagon note data and matches the requirements of the electronic consignment note defined by the CIT.
Our common objective is pushing sector digitization

THE BIG PICTURE – RAIL FREIGHT IN FULL TRANSFORMATION

CONNECT
EXCHANGE
INNOVATE
By 2026, we want to achieve a seamless data flow in European rail freight operations through a trusted digital ecosystem connecting key rail freight partners.

- Deliver convenient and compliant access to essential and high-quality operational data...
- Improve coverage by successively connecting railway undertakings and breaking data silos...
- Boost and incentivize innovation to ensure the railway sector’s future competitiveness...
DP-RAIL allows us to move from a data patchwork landscape...

**SIMPLIFIED AS-IS**

- Inefficient
- Unstructured
- Slow to adapt
Definition of a common data catalogue

Relentless focus on data quality

Leveraging existing standards

DP-RAIL as a central platform enabling communication between ecosystems

Booster for creation of European Mobility Data Space

* Industry standards
## How are we doing this? Our first Use Cases...

<table>
<thead>
<tr>
<th>Use Case</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital Train Operation</td>
<td>Enable all stakeholders (including non-incumbent RUs and operative staff) to participate in standardized TSI compliant data exchange regarding train operations completing wagon movement messages</td>
</tr>
<tr>
<td>Digital Train Handover</td>
<td>Shorten, digitalize and standardize handover processes, e.g. by distributing necessary transport documentation digitally and increase coverage of Hermes30. Reduce physical / manual hand over processes to a minimum.</td>
</tr>
<tr>
<td>Digital Train Composition</td>
<td>Enable RUs to create Train Composition Messages easily and share digitally with other involved RUs and IMs.</td>
</tr>
<tr>
<td>Track &amp; Trace / Telematic wagon data</td>
<td>Boost data quality in tracking related fields by implementing a sharing logic and rulebook on the digital platform. On this basis, high-quality telematic data is shared with RUs for their disposal enhancing wagon movement messages</td>
</tr>
<tr>
<td>Digital Consignment Note</td>
<td>Provide digital tool enabling all RUs, especially those without connection to existing platforms such as Orfeus, to deliver and access TAF TSI COM messages</td>
</tr>
</tbody>
</table>

Application for CEF funding filed in Jan 2023: **CEF-T-2022-SIMOBGEN-REMIB-WORKS**
THANK YOU

https://www.raildata.coop
www.dp-rail.eu
www.railfreightforward.eu
www.uic.org
Back up
RAILDATA

A legacy digital platform (a UIC Special Group [https://www.raildata.coop/](https://www.raildata.coop/)) that can be leveraged NOW to facilitate the exchange of Electronic Consignment Note data.
UIC activity with its digital platform RAILDATA

Exchange of electronic Consignment Note data

- 16 RUs participating in the ORFEUS system
- 95,000 messages with Consignment note information are sent by members via ORFEUS each month
- consignment note related data (pre-advises) is being exchanged

Figure 1 - Geographic Scope of ORFEUS
ECN Data Exchange

- Some RUs currently support the use and transmission of the ECN
- ECN exchange on the entire network is possible on a technical level through ORFEUS
- Exchange is limited to bi-lateral exchange due to legal, business, process, and technical constraints
Constraints for Deployment

biggest obstacle to full deployment is that RUs cannot support the cost burden of both paper-based and electronic processes

- Dangerous Goods (Legal)
- IT System Constraints (Business)
- Member States require paper CNs (Process, Legal)
- Compliance with TAF-TSI (Legal)
- NCTS - Customs (Process, Business, Technical)
- Cost (Business)
Addressing the Constraints

• There has been a commitment by Raildata to provide the portal for stakeholders to communicate the mandatory ECN and Status messages in order to assure compliance with the TAF-TSI Regulation

• ECN message specification has been updated to include information to support Customs and the NCTS requirements

• The technical specification for CIM/SMGS message format is under development

• Coding issues, particularly for Locations and Company Codes are being addressed

• Wide sector project DP-RAIL awaiting financing from EU
ORFEUS

Open Railway Freight EDI User System
What is ORFEUS?

ORFEUS (Open Railway Freight EDI User System) ensures the exchange of railway CIM consignment notes data between the co-operating railway undertakings (RU) using a Central Data System (CDS).
What is ORFEUS?

ORFEUS offers 2 possibilities:

**Simple forwarding of consignment note data**

Consignment note data is forwarded simultaneously to all participating railway undertakings. In addition a paper consignment note has to accompany the transport.

ORFEUS Versions:

- ECTD 1.42
- ECTD 1.5
What is ORFEUS?

**Electronic consignment note**

Instead of a paper consignment note, an electronic consignment note, handled by the CDS of Raildata, accompanies the transport.

**ORFEUS Versions:**
- ECN 1.42
- ECN 1.5
What is ORFEUS?

Utilized message type:

The ECN-xml message is capable to carry 100% of consignment note data or CUV wagon note data and matches the requirements of the electronic consignment note defined by the CIT.

Latest version: 1.5
ORFEUS and TAF/TSI:

TODAY
The latest version of the ORFEUS –ECN xml 1.5 is soft compliant to the TAF/TSI consignment order message. All locations within the message are coded as TAF/TSI locations (Primary and subsidiary location codes etc.)

TOMORROW
The next version of the ORFEUS –ECN xml 1.6 (not implemented yet) will be completely compliant to the TAF/TSI consignment order message. The next ERA TAF/TSI data catalogue will contain the ORFEUS –ECN xml 1.6 as the consignment order message.
Next steps with ORFEUS

TECHNICAL EVOLUTION
Although still most of our partners are using xml and ftp-clients as means of transmission, new standards as JSON and connection via REST-APIs will be developed for the connection of new partners

CIM-SMGS
A complete CIM-SMGS consignment note schema was developed in cooperation with OSJD and CIT but is not implemented yet in the central data system
Why using ORFEUS?

- No longer collection of consignment note data at handovers to next RU
- Potential of automatic billing
- Waiving of paper consignment note