International rail freight: Network in search of an operating system

Secretary General of OTIF - François Davenne
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COTIF – developing uniform law

- Founded in 1893 in Bern
- Applies to international traffic by rail
- Is international law
- Member States can make declarations not to apply selected parts of COTIF
- Accession of EU in 2011: a bridging role

**Freight / Passenger Contracts**

- Legal interoperability

**Dangerous Goods Regulation**

- Exchange of dangerous goods wagons
- Technical interoperability

**Technical Regulation**

- Safe exchange of vehicles
Geographical scope of COTIF: EU/OTIF a complementary approach
An operating system for rail
Unified railway law to connect Europe, Asia and Africa

Current situation

Incompatible national networks: burden of complexity without efficiency gain

No common grounds for standard contracts

Interoperability concept limited to EU

Rail does not benefit from its natural competitive advantages in international traffic

Target situation

Connected
  • Purely national networks belong to the past
  • A regional approach is vital

Uniform
  • Common technical and contract law
  • Common high level rules

Interoperable
  • Common technical rules
  • Definition of common interfaces
  • Partnership based approach with other organisations
### Gaps in international uniform rules

<table>
<thead>
<tr>
<th>What is missing</th>
<th>Single contracts for Euro-Asian backbone</th>
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<tbody>
<tr>
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<td>A common understanding of interoperability, possibly backed by law</td>
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<td>Digital tools for the international traffic</td>
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<td>Digital rolling stock fleet management tools</td>
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<th>What should be questioned</th>
<th>Market opening as international rule?</th>
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<tbody>
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<td>Abolishing regional regulation or developing legal and technical interfaces?</td>
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<td>Who should determine the operational rules?</td>
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<td>Path to multimodality: legal interoperability or single regulation?</td>
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OTIF’s regulation: OTIF today and tomorrow

Level 1
International transport of goods and passengers

Level 2
International exchange of railway vehicles

Level 3
Interoperability of trains in a network of different systems

Level 4
Unified railway Market

Market access
Competition regulation (not in scope of COTIF)

Safety and operational rules
CCS compatibility/telematics applications
CUI liability regime:
Towards a GCU for international train paths

ATMF, APTU
Vehicle operational requirements in UTP
Accessible national vehicle registers.
CUV/GCU for vehicles use

RID
Contract of carriage CIM, CIV
Thinking regulation for digital services
Paket switching / Wagon switching: an analogy

1. Each terminal must be able to exchange data with any other terminal.

2. The data units (the packets) shall be exchanged between the node and across the physical lines.

3. The physical signals shall be transmitted along the line and physical interfaces.

⇒ An analogy can be made with freight transport by rail.
⇒ Data transmission model can be used for modeling interoperability and transport concept.
OSI (Open system interconnection) from physical link to service definition

- Dealing with the conceptual difficulty of multiple interfaces and their hierarchy
- Adopting a service oriented approach

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<tr>
<th>Data unit</th>
<th>Layer</th>
<th>Function</th>
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<tr>
<td>Host layers</td>
<td>Data</td>
<td>7. Application</td>
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<td>6. Presentation</td>
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<td></td>
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<td>5. Session</td>
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<td>Segments</td>
<td>4. Transport</td>
<td>Reliable delivery of packets between points on a network.</td>
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<td>2. Data link</td>
<td>A reliable direct point-to-point data connection.</td>
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<tr>
<td>Frame</td>
<td>1. Physical</td>
<td>Physical signal transmission (with wire or wireless, modulation schemes, etc).</td>
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</table>
• Each entity interacts directly only with the layer immediately beneath it, and provides facilities for use by the layer above it.

• Protocols enable an entity in one host to interact with a corresponding entity at the same layer in another host.

• Service definitions abstractly describe the functionality provided to an (N)-layer by an (N-1) layer.
Freight transport: a layered approach for building digital services

1. Physical layer: Physical requirements

2. Interoperability: Compatibility with the network

3. Inter-exchangeability: Assuring inter-change and wagon fleet management

4. Digital transport management:
   - Digital contracts (CIM/CUI)
   - Customer oriented train/wagon monitoring

Digital logistics management tools:
- Integration of TAF, positioning, train path information, etc..

CEN standards / UIC leaflets

TSI/UTP

GCU based on CUV UR
Thank you for your attention