The role of UIC as motor for common railway standards

UIC and railway standards
UIC has been for many years the only worldwide rail association where standards, best practices and networking between the railway companies have been developed. Obviously, other general-purpose standardization bodies have been introduced over time: at European level, these were in succession CEN (1961), CENELEC (1973) and ETSI (1988). Of course UIC cooperates with these bodies, and the cooperation has recently been formalized via bilateral agreements.

However, UIC retains three distinct features:

1) UIC supports its members, rather than gathering the voices of national standardization bodies;
2) UIC members are rail operating companies;
3) UIC scope of work includes commercial services, operations, and maintenance.

Given these features, UIC is able to focus its works and products on the very interests of rail operators. UIC provides necessary and useful complements to the other international standardization activities. As standards are by definition consensus-based, UIC standards would also benefit from efficient decision-making, since technical and operational interests of rail operating companies are likely to converge, even in a competitive context as we currently have in Europe.

The construction of the single European market for railway supplies and railway services is certainly a powerful driver for standardization, and UIC has vastly contributed to it. But leaving regulation aside, there is also a considerable room for streamlining processes and optimizing services, and this is pure railway business.

Not surprisingly, we experience a surge of UIC standardization activities. Our Standardization Platform has set the goal of using “Standardization [as] the means to provide the integration, dissemination and exploitation of best practices, results and procedures, while linking them to the economic factors for the benefits of Customers”. In its first years of operation, the Standard Platform has created clusters of revitalized UIC leaflets organized under the International Railways Standard layout, derived from ISO.

Focus on infrastructure data
The current UIC codex is divided into ten chapters; the last one deals with information technology. This subject has been handled by UIC from the seventies already, with continuous updates and numerous cancellations.
Indeed, we should avoid developing and maintaining proprietary standards about non-specific items. Railway infrastructure has lots of specificities, and UIC members manage one million km of infrastructure, a costly and valuable asset.

Information on infrastructure is being handled by millions of railway employees, and infrastructure data are shared with suppliers, regulators, customers, research institutes and universities. The data exchange volume is bound to increase, especially in Europe: the rail system is now a shared system, meaning that more information is shared with more parties.

The Single European Railway Area Directive, 2012/34, foresees multi annual contracts between Member State authorities and infrastructure managers, covering all activities, including investment and maintenance. While such contracts may already have existed here and there, it is clear that the Directive will entail an increased exchange of infrastructure-related information between ministries and infrastructure managers. Such multi annual contracts are expected to improve the financial robustness of rail, but they will come at a cost. Its order of magnitude is considerable, given that (according to the European Railway Agency) the first setting up of the Infrastructure Register may already cost 120 M€, EU-wide. Further data conversion and transmission will entail significant administrative burdens and should urgently be taken care of.

**UIC involvement in Rail Data Modeling**

Gathering infrastructure data is now, by virtue of European law, the task of the European Railway Agency. UIC has recognized that fact and put data collection on the backburner, in favor of data structuring. This is the origin of the Rail Data Modeling project. However, the voluntary adoption of a common data model may take some time, hence the complementary project of defining a single data exchange format, based on an emerging, open-source, de facto standard which is railML®.

While railML® will further be managed by the consortium that first created it, the future versions railML will remain able to handle the Rail Topological Model defined by UIC. The UIC RailTopoModel will materialize in 2015 by the creation of a corresponding International Railway Standard (IRS). This standard will be independent of any usage, therefore open to all developments, and a converging point for all future projects. We make sure that the model remains scalable (e.g. from the global corridor view to the detailed signaling trackside equipment view) and extensible.

In particular, railway infrastructure is not limited to tracks; passenger stations and freight terminals are also the gates to our end customers and interconnecting with other modes. This is where we would see the most obvious extensions of Rail Data Modeling.

That being said, I invite you to discover and discuss, today, our first advances in network data modeling, conversion, transmission and visualization: practical tools for an important purpose at minimal cost.

Thank you very much for your attention and for your confidence.
UIC RailTopoModel and railML® as opportunity for ERA´s projects

2nd UIC RailTopoModel and railML conference
Paris, 8 April 2014
Dr.-Ing. Andreas SCHIRMER
The European Railway Agency (ERA)

Location: Valenciennes (F)
Founded by Regulation (EC) 881/2004
Approx. 150 staff from 20 Member States
EU Directives: Interoperability, Safety, Train Driver
The European Railway Agency (ERA) « making the railway system work better for society »

**Strategic priorities**

1. Harmonised Safety Regulatory Framework
2. Removal of admin. and technical barriers
3. Single EU train control and communication system
4. Simplified access for customers

**ERA outputs**

- Developing
  - EU rules for Interoperability*
  - Common EU Safety Methods
  - Databases and registers
- Monitoring/Reporting
- Facilitating/Dissemination

**Customers/Stakeholders**

- EC + DG MOVE
  - Member States / RISC
  - EU Parliament
- Railway Undertakings
  - Infrastructure Managers
  - Manufacturers
- National Safety Authorities
  - National Investigation Bodies
  - Bodies in charge of registers

*TSIs
The European Railway Agency (ERA)
Focus: Interoperability Unit and Registers

**Executive Director**
- Safety
  - Regulation
  - Reporting
  - Certification
  - Assessment
- Interoperability
  - Coordination
  - Operation
  - Rolling Stock
  - Fixed Install.
- Economic Evaluation
- ERTMS
- Cross accept.
  - Evaluation
  - Auth. Process
- Administration
  - HR
  - Finance
  - IT/Element

**Registers**, NoBos, OTIF, ESOs
OPE TSI, Train Driver, TAF/TAP
WAG, LOC&PAS, NOI, SRT, PRM TSI
ENE, INF TSI,
Vehicle and Infrastructure related Registers

Strategic Priority: « simplified access for actors »

› European Centralised Virtual Vehicle Register (ECVVR)
› European Register of Authorised Vehicle Types (ERATV)
› Vehicle Keeper Marking Register (VKM)
› ERA Database of Interoperability and Safety (ERADIS)
  - EC declarations
  - ECM certificates
› Register of Infrastructure (RINF)
Register of Infrastructure (RINF)  
RINF system architecture

railML®
ERA follows the railML initiative to provide a single railway-related data format
ERA recognises the added value for the railway sector
ERA sees also the benefits related to the population of the RINF CUI database
ERA supports railML by providing information on
- how the information system works internally
- how the system interacts with the users
ERA welcomes the ongoing collaboration with railML, but this is just the beginning of the RINF story...
ERA principal working method
All players are invited to contribute

Experts from the European Stakeholders:
UNIFE, CER, EIM, EPTTOLA, UITP, UIP, UIRR, ERFA, ETF, ALE

Experts from the National Safety Authorities (NSA)

Working party
Working party
Working party

European decision making process
Opinion of the RISC
Commission
ERA recommendation

Social partners
Passengers and customer associations
Draft
Making the railway system work better for society.

era.europa.eu
ÖBB-Infrastruktur AG

Keynote:
Opportunities for the IT Strategy of an Infrastructure Manager

Ernst Heger, CIO ÖBB-Infrastruktur AG

2nd UIC RailTopoModel and railML® conference
UIC Paris
Tuesday, April 8th, 2014
This organization chart shows a selection of key companies of the ÖBB Group.
6.27 billion Euro in total revenues

39.833 employees

4.894 km rail network

464 Mio. passengers (rail & bus)
**Statement of Holdings (in extracts)**

<table>
<thead>
<tr>
<th>IMMO GmbH*</th>
<th>REQ GmbH</th>
<th>MdBH*</th>
</tr>
</thead>
<tbody>
<tr>
<td>GWP GmbH</td>
<td>BBT SE (50%)</td>
<td>MUNGOS GmbH</td>
</tr>
<tr>
<td>BPG GmbH</td>
<td>WWG GmbH (30%)</td>
<td>ÖBB-TEL GmbH</td>
</tr>
<tr>
<td>Project Terminal Service Austria</td>
<td>WS Service GmbH</td>
<td></td>
</tr>
</tbody>
</table>

*Regulation of project development, utilization and portfolio management, project companies, Operations and Systems.

**Stand:** 01.03.2014
Approx. 16,000 employees (01/07/2013)

More than 1,100 stations and stops

247 tunnels

6,310 trains (daily), 142 million train kilometres

10 self-owned hydroelectric power stations

72 Mrd. billion gross tonne-kilometres (1990: 47 bn)
… plans, builds and operates reliable, demand-oriented Austria's railway infrastructure.

… lays the tracks for a state-of-the-art, eco-friendly Austrian rail network.

… ensures punctuality, safety and cleanliness on the rail network.

... we invest one hundred per cent of our power & energy into the railway system!
IT Service Map of ÖBB-Infrastruktur AG
Current Layout Plan – Highly Aggregated

Level 0
Integration Level to rail transport companies, other infrastructure providers, …

Level 1
ÖBB-Infrastruktur AG

Level 2
Core Process (Operation, Asset Management)

Level 3
Business Area

Level 4
Project
Enterprise Application Integration [EAI]

Point to Point
Inflexible

N \cdot (N-1) \over 2

Hub & Spoke
Bottleneck

Publish & Subscribe
High Performance

Standard Repository

3 Dimensions
• Physics
• Syntax
• Semantics

2 Dimensions

Klassifizierungsstufe: ÖBB-Infrastruktur AG / Stab IT (öffentlich)
UIC RaDaMo 08.04.2014
22.04.2014
Railway as an Overall System
The technical dependencies are not mandatory the Organisation's

INTERLOCKING

ROLLING STOCK

TIMETABLE

INFRASTRUCTURE

MAINTENANCE
Example out of the Air (AIXM)
Reference Data Model: ready-made vs. dedicated

ready-made

use-case-made
for the dedicated lines of business
The Perfect Basis for System Integration

Let’s play together

EXCHANGE / REFERENCE MODEL

IDM

INFRASTRUCTURE

RailTopoModel

Multilevel TOPO MODEL

Overall RAIL SYSTEM

rail

ML

3.0

Overall
What we need

• Focus on an “Overall System Railway”
  • AND timetable
  • AND interlocking
  • AND rolling stock
  • AND infrastructure
• International layout
• Multilevel topological model with generic layers
• Data exchange (internal / external)
• Best practice uses cases
• Comprehensive documentation
• Reference model for rail infrastructure
  • Component driven structure
• You must not change to ONE model, but you CAN heal existing systems using a COMMON SENSE
Thank you for your kind attention.