Towards a Universal Topology Model for Railways and Data Exchange Format for Infrastructure

UIC, Paris October 7th, 2014
Benefits of a shared data- and exchange model in an integrated business model.

Towards an integrated data approach in the value-chain of railway engineering and -utilization.

Two examples:
• Inside a domestic railway sector
• International in EU context

Dirk Kes, ProRail Netherlands
Our challenge

Offer the railway sector:

→ A powerful and strong Object Model

→ A structured and evolutive exchange format
Approach:
• Common data-basics in core;
• Domain additions as specific extensions

Define a generic kernel of the rail infrastructure model: its **topology** in at least three layers

Select generic themes which always show up in railways

Extend the kernel model (topology) with these themes

Re-use each time this (extended) kernel model as a start for specific application models.
Future objectives:
“integrated data storage, maintenance and exchange”

Overall stage the play

Cooperation on project level

Design data spaces

one model with standardized exchange formats across the whole value chain → railML® 3 !

Integrated data-image

Overall sharing of data

planning | design | construction | maintenance | utilization
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capacity analyses | Study on alternatives | detailed design | realisation | monitoring | maintenance incident mgt | timetabling Traffic control | Other usage

Future objectives:
“integrated data storage, maintenance and exchange”
Standardisation on EU level: RINF NRE-interfaces
Current problem of data exchange for NRE’s

- Absence of available standards: Each data exchange requires a specific data definition (model) and file format (interface) leading to a specific computer interface programme.

- Consequences: Heavy IT development and high costs with long project times, no re-use of data and software development, less place for industrial approach.
a data exchange standard: describing only the infrastructure characteristics. The usage related data is **added on top** of this reference “basic” infra data.

**Advantages:** Opportunity for each IM to invest for future re-use of the IT development, the complete toolset is re-usable for all future needs for exchange of infrastructure data, **Mio-€€’s** would become an investment and not a one shot expense
UIC RailTopoModel and railML

UIC RailTopoModel is the foundation of RailML3

The objective is to provide, in addition to the standards, a complete standard set of tools

Services
Data manipulation, transformation,… e.g. railML4RINF converter

RailTopoModel

- SQL Schema
- SQL Loader

railML ® 3.0

- XSD / XML
- XML Syntax Check
- Topology Check
- Viewer
Thank you for your kind attention