Digital Modelling
Standardisation & Digital Continuity

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Railway sector requires leverages for performance

Railway system design, construction and operation involve multiple technologies, actors, processes, software... working together in a continuous collaborative process for evolution.

Customer requirements, evolution of technology, and search for performance are leading to a stronger integration of the Global Railway System.

e.g. future Autonomous Train is an integrated solution involving all subsystems: Train, Infrastructure, and Traffic Management.

Going for global performance requires to design, simulate, implement and operate the Railway System as a continuous whole.
One example for digital continuity, including standardization

Infrastructure Network object is viewed as **Topology and Routes** by Access Planning, Traffic Management and Operators, and as **systems, equipment and devices** by Engineering and Maintenance.

Performance in capacity planning and operation highly depends on close collaboration between Traffic Management and Maintenance (Works footprint on capacity).

The Digital standards (shared language) should ensure digital continuity between all actors.
Simulation and optimization throughout the entire life-cycle

Business requirements

Network design

Design & construction

homogeneous, consistent, lossless and machine readable data flow (no media breaks)

BIM
design, simulate, test, ... to validate the system, and boost confidence

seamless simulation and optimization of Operation

Capacity planning

Traffic mngr

CK

operational system

digital twin

Test and validate each sub system, and their integration

Simulate global behavior for project validation

Railway BIM International action for implementation of digital standards & interoperability
Railway System is complex …

... behaves as a whole

... with multiple sub-systems and dimensions,

... leading to several Projects for standardization
(each focusing on domain/process)

But … all projects for standardization describe the same System
How to handle an Agile Global System Model?

Each standard handles parts of the system models, both in terms of sub-systems and/or facets.

Our major Sectorial challenge is to federate standardization bodies, to build together the Digital Continuity.
Railway sector, both operators and manufacturers, invest a lot of resources in those projects for digital standardization.
Railway sector organizes foundation for digital continuity: a common dictionary

**Unified Rail Digital Dictionary**

**Autonomous Standardization Bodies**

**Business processes involving different software**

UIC leads the OntoRail project for a Common Digital Dictionary, involving all current projects for digital standardization and their stakeholders.

Unicity  Autonomy  Continuity

Software based on RTM
Software based on IFC Rail
Software based on EULYNX
Software based on S²R CDM
Software based on railML

UID

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Next step: Organize the combination of standards to foster multi-dimension simulation and optimization

A business project willing to take benefit from standard models will have to combine multiple ‘parts’ from different standard models, multiple inputs/outputs from different software.

The challenge is to make this combination feasible for end user (efficient, and sufficiently convenient, with regards to expected benefits, compare to going for a specific model).

We currently explore Ontologies to combine consistent standards and enable digital continuity in operation.
Thank you! for your kind attention