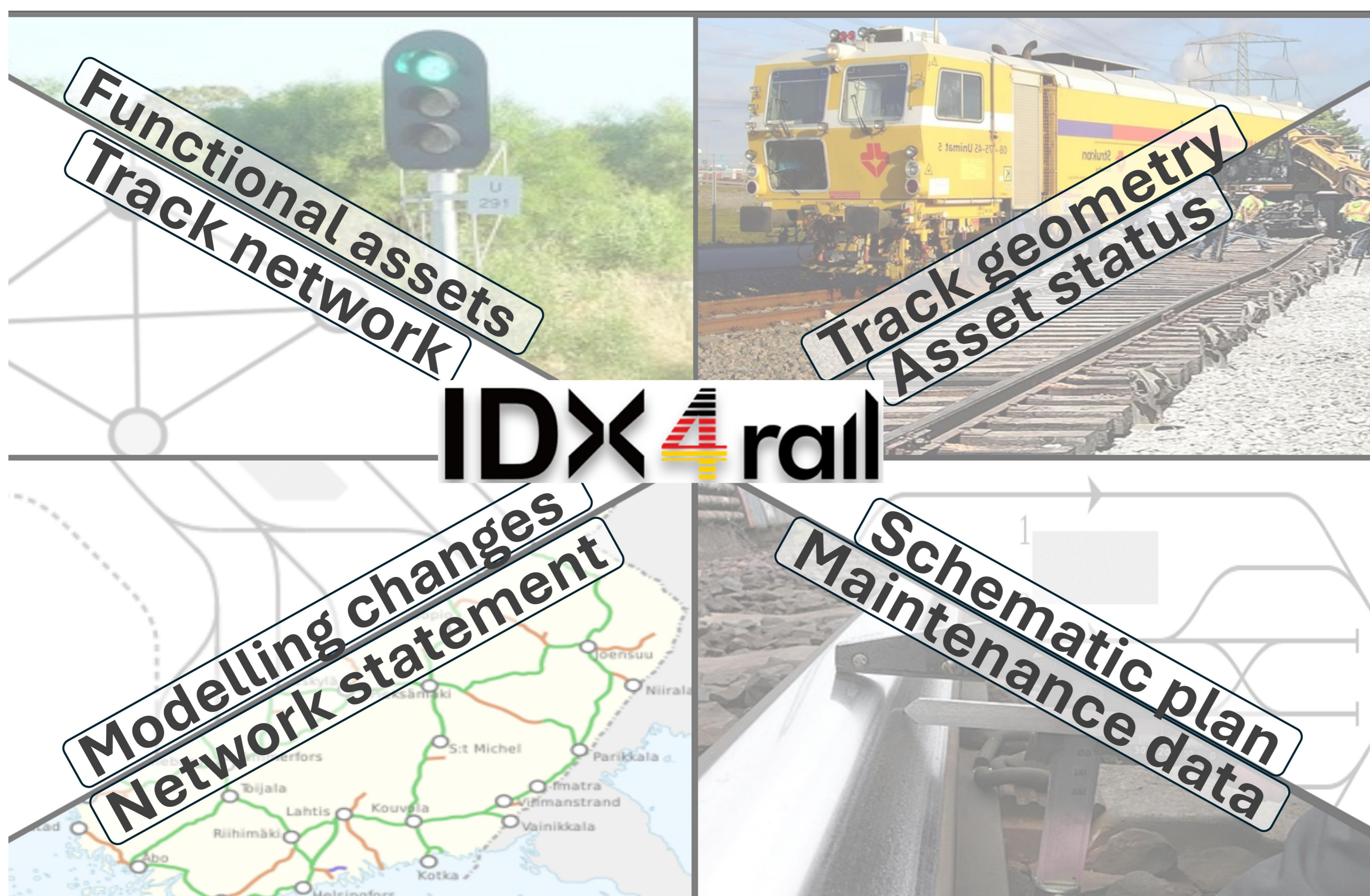


IDX4rail – Use Case Approach

For data exchange of light rail and tram infrastructure

The aim is to facilitate data integration and transformation utilizing state of art technologies by proving a common language for all rail-based ways of transport.



No inconsistencies are found between use cases. Furthermore in most cases they are complementary, e.g. “Functional assets” builds on the top of “Track network” adding functional infrastructure or “Track geometry” builds on “Functional assets” adding necessity of topology and geometric coordinates of the tram-railway tracks.

Problem statement

Currently there are two standards railML® and IDMVU for rail- and tramway data correspondingly. Thus rail- and tramway parties are siloed from each other even though there already exists and successfully operates rolling stock able to go on both e.g. Karlsruhe Stadtbahn.

Methods

The new standard is to bring together infrastructure managers. With this in mind, participants developed eight use cases during the two first work packages of the Germany Ministry funded IDX4rail project.

Ontology-based language

New IDX4rail ontology-based language is to facilitate data integration and transformation utilizing state of art technologies e.g. RDF, OWL and SHACL. This allows for the incorporation of natural language constraints into the model and their automated validation.

Track network. IDX4rail standard allows for a very base description of the railway (tram-) network in the graph like RailTopoModel representation which is to be used for the precise localization of all relevant information objects in reference to the network.

Functional assets. Building on the top the network use case it is possible to add the physical infrastructure, e.g. tracks, signals and switches, and their location in the network.

Track geometry. Further description of tracks, alignment in horizontal and vertical planes with geometric coordinates roughly corresponds to the scaled track plan.

Asset status representation. Status which can be operational or disabled in e.g. case of track works is used for short time planning of operations and maintenance.

Schematic track plan. The plan of e.g. railway station with screen coordinates is used by tram- railway dispatchers.

Maintenance data. Current defects of the functional infrastructure (mainly tracks) is used to plan maintenance measures and economic benefits.

Network statement. Publication of the railway network in the mesoscopic level of details is required by the directives of the European Union.

Change management. Representation of deleting or addition of new functional infrastructure or topological elements in base case.

Further works

Requirements for the new IDX4rail standard were grounded. In the following work packages the conceptualization, formalization and implementation of a common language for all rail-based ways of transport is to be performed.

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