



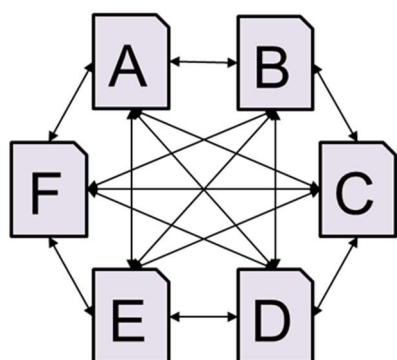
Research on infrastructure data management continues

IDX4rail will shape the future of standardized interfaces

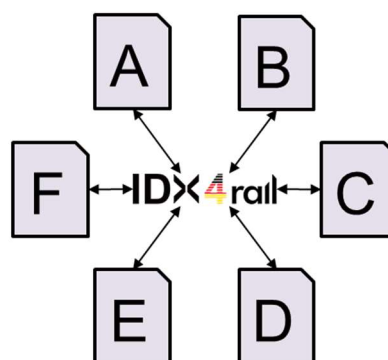
IDX4rail will be a milestone in digital technology for infrastructure data management (IDM) in the railway sector. It will harmonize the interface environment in particular for trams and standard-gauge railway to allow organizations in the field to reliably and efficiently exchange data across various systems, applications, and international standards. IDX4rail will achieve this goal by networking with relevant international stakeholders and cooperating with related research projects. IDX4rail is spearheaded by railML.org e.V., GüteZert GmbH, DLR Institute of Transportation Systems, and ERDMANN-Softwaregesellschaft mbH. The project is funded by the German *Federal Ministry for Digital and Transport's* innovation initiative *mFund*.

Old challenge, new level to the problem

Standardizing the digital exchange of infrastructure data in the railway sector is not an entirely new challenge. Already since the 1990s interface standards have been developed to enable more reliable and efficient data exchange between systems, analogous to a *lingua franca* or shared language, like English in most business fields. However, as more and more standards were developed, the original problem re-emerged on the level of interface standards. Today, there are plenty of interface standards such as railML and IDMVU that standardize data exchange in their respective focus areas. However, the data management of public transportation organizations (PTO) comprises a myriad of interfaces, specialized systems and applications, and even proprietary systems to handle individual challenges. Consequently, there are significant differences in PTO's data management. These are often caused by legacy systems and siloed solutions which lead to a highly heterogenous interface environment. To put this into perspective, in the absence of a harmonized interface standard the number of interfaces with existing systems multiplies for each additional proprietary system entering the market.



Interface environment with multiple standards and systems



Harmonized interface environment with IDX4rail

Results by the end of 2025

After several preparatory stages the research project was officially launched on February 9th, 2023. IDX4rail's goal is to address the data exchange problem precisely on the level of interface standards. To achieve high acceptance of IDX4rail as a sustainable interface standard for the future of IDM, the project team collaborates closely with relevant stakeholders in the German railway sector. This collaboration is key to consider both the technical and practical sides of data management in the development process. Moreover, the project team seeks out opportunities to team up with international stakeholders in the railway, data management and geospatial information sectors as well as related research projects – especially in countries that share borders with Germany. IDX4rail is initiated in Germany with the intention to scale up to an international level in the near future. At a later stage a prototype for IDX4rail will be developed by ERDMANN and field tested together with involved PTOs. An iterative feedback process will ensure that the prototype will be continuously improved. From 2024 onwards, the project team will gradually host and attend more and more networking events to provide update the community about the progress and to connect to interested stakeholders. IDX4rail will be completed by the end of 2025. As a result, the project will deliver an open source data converter, a thorough interface documentation, and comprehensible examples for applications in tram and standard-gauge rail.

Status of the project

Currently, the project team conducts a series of workshops with the involved stakeholders to identify and analyze technical and practical requirements for IDX4rail. Aside from integrating critical use-cases of existing systems and standardized data formats, new use-cases based on shared practice are discussed. Additionally, railML's timetable features will be incorporated to cater to the extended needs of PTO's IDM and trending developments such as BIM are considered as well. At the 43rd railML Conference in Berlin on May 30th 2023, IDX4rail was introduced to the railML community and preliminary results of comparative analyses of IDMVU and railML were presented. Analysis of the data models reveals similarities between both standards and the underlying GML-/XML-format. Ontology analysis using Simple Knowledge Organization System (SKOS) further reveals that both ontologies match closely for most use-cases. The final results of the analyses and the workshops will be summarized in the initial specifications report in summer 2023.

For enquiries and additional information contact info@idx4rail.railml.org.

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