



BIM/IIM in der LST am Beispiel Scheibenberg

14.06.2022 – M.Sc. Ralf Müller

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BIM-Gesamtmodelle für Straßen

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BIM-Gesamtmodelle für Freileitungen und Erdkabel

1. Digitaler Zwilling für Öffentlichkeitsarbeit und Planungsbesprechungen



2. Verifizieren ob EULYNX für die Integration in BIM-Modelle geeignet ist

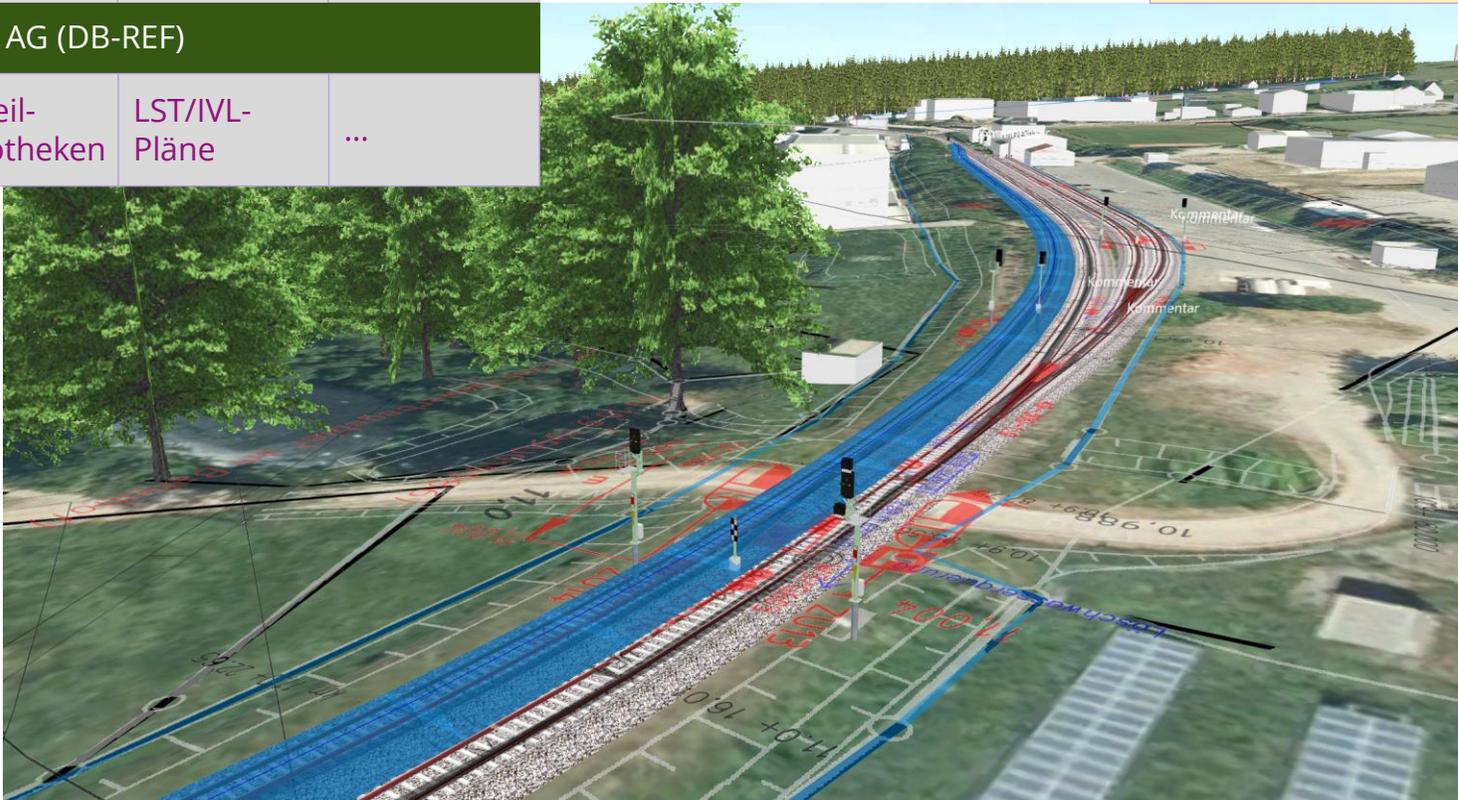
Was fehlt ?

Aufbau des Digitalen Zwillings

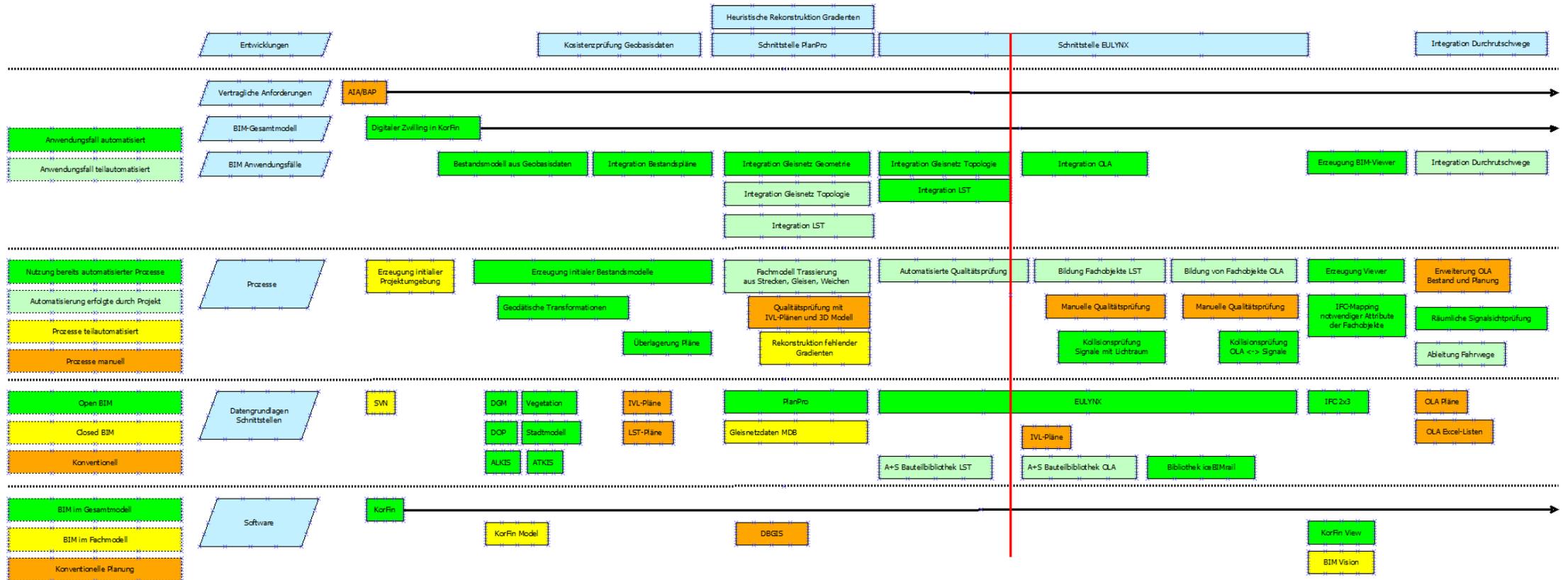
Geobasisdaten Sachsen (UTM32N)			
Orthophotos	Gelände	Stadtmodell	Raumordnung
Liegenschaften	Basis DLM	Flora und Fauna	...
Grundlagen der DB AG (DB-REF)			
Gleisnetzdaten	Bauteilbibliotheken	LST/IVL-Pläne	...

Dynamische Transformation

Projektgebiet	Fachmodelle Bestand	
Projektdefinition DB-REF, Ursprung	Gelände	Vegetation
Gebietdefinitionen GoogleEarth	Stadtmodell	Geo-information
Fachmodelle Planung		
	Gleisnetz	LST
		EULYNX
3D Betrachter		
Verknüpfung semant. Objektmodell (SOM)		



Softwaretechnische Umsetzung EULYNX



Signalling Engineering
https://dataprep.eulynx.eu/2022-01/index.htm?goto=3:3:3:11273

A+S FTP EMS A+S - Plan DGUV - FB EH Betriebli... Aktueller Sprint Meine direkten Tickets SCRUM Board - Agile... CI StatusBoard Korfin Handbuch Clockify Korfin - Confluence
Weitere Lesezeichen

Signalling Engineering

- Signalling Engineering
 - Landing Page
 - EULYNX DataPrep
 - RSM_1.2
 - RSM 1.2 introduction
 - RSM1.2 - Packages overview
 - RSM1.2 - High-level classes
 - General documentation
 - «Domain» Common
 - Infrastructure
 - RSM1.2 Infrastructure - Packages
 - «Domain» NetEntity
 - «Domain» Track
 - «Domain» Signalling
 - RSM1.2 Signalling**
 - OnTrackSignallingDevice
 - RouteBody
 - Signal
 - TpsDevice
 - VehiclePassageDetector
 - Energy
 - Environment

DISCLAIMER:
This diagram and its contents are part of version 1.0 of the EULYNX Data Preparation model that is released under EUPL 1.2. The model will continue to evolve as national requirements are incorporated.

RSM1.2 Signalling

The RSM signalling package provides simple classes for signalling equipment. Detailed information is delegated to the EULYNX DP model.

[EULYNX](#) is an initiative by European Infrastructure Managers (IM) to standardise interfaces in the interlocking and signalling systems. EULYNX Data Preparation ([EULYNX DP](#)) defines a UML model to support the exchange of signalling engineering data between IM and signalling supply industry.

EULYNX DP provides a detailed model of signalling objects. RSM provides skeleton classes so that other domains, for instance energy and communication, can be aware of the existence of signalling equipment and may retrieve detailed information from a EULYNX DP data.

This layered yet uncoupled architecture allows users to create data sets that contain only information relevant to their domain. When needed, users can look up information from other domains, using references across data sets.

RSM signalling classes

Signal

Apparatus by means of which a conventional visual or acoustic indication is given, generally concerning the movements of railway vehicles.

A track-level path that can be followed by a railway vehicle.

Path is described by, and refers to, a linear location, i.e. a closed, oriented topological subset of the network, without any branches.

EULYNX DP defines a route body with an entry and exit. One may give the positions of points (=turnouts) that the train encounters (facing or trailing) in the route body.

RouteBody

Superclass for all on-track signalling devices. Encompasses balises, axle counting heads, LZB cables, etc.

Device that transmits train protection information to a passing train. E.g. crocodile, (Euro-) balise, magnet, loop. On-track TPS devices such as balises or crocodiles are associated with spot locations. Loops are associated with a linear location.

Line-side device for detecting passage of a rail vehicle.

OnTrackSignallingDevice

TpsDevice

VehiclePassageDetector

```

classDiagram
    class NetEntity {
        <<abstract>>
        +Location BaseLocation
    }
    class Location {
        <<abstract>>
    }
    class SpotLocation
    class LinearLocation
    class AreaLocation
    class Signal
    class RouteBody
    class OnTrackSignallingDevice
    class TpsDevice
    class VehiclePassageDetector

    NetEntity <|-- Signal
    NetEntity <|-- RouteBody
    NetEntity <|-- OnTrackSignallingDevice
    NetEntity <|-- TpsDevice
    NetEntity <|-- VehiclePassageDetector
    Location <|-- SpotLocation
    Location <|-- LinearLocation
    Location <|-- AreaLocation
    NetEntity "1" -- "0..1" Location : +locations
    OnTrackSignallingDevice <|-- TpsDevice
    OnTrackSignallingDevice <|-- VehiclePassageDetector
    
```

Illustration of the layered model

Below graphic visualises the layered architecture. A signal is a located net entity and by this virtue has a spot location that ties it to the railway network. RSM informs about topology, location and orientation. EULYNX DP enriches the signal class with attributes and relations relevant to signalling. An instance of a signal in the EULYNX DP domain refers to a signal in the RSM domain.

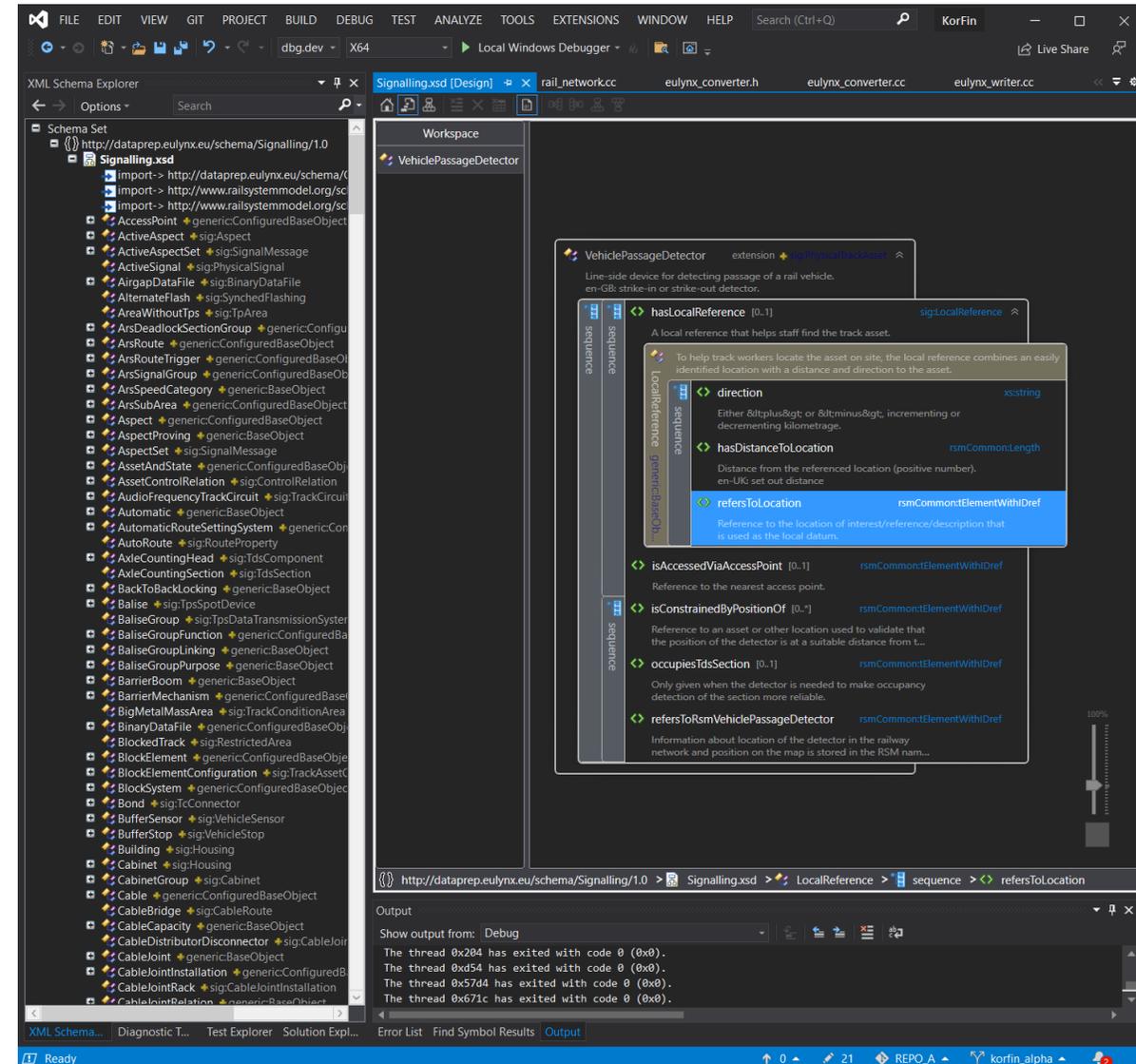
A user can scan the RSM data for signalling equipment. Only when the user needs detailed signalling information, does he look up the corresponding signal in the EULYNX DP dataset. Another user may not need detailed information about the signal in which case it suffices to know that there's a RSM signal.

Other layers can be added. For instance, a third party can add classes with information relevant to maintenance and that refer to the objects in RSM.

Name: RSM1.2 Signalling
 Author: bob.janssen
 Version: 1.2
 Created: 11-3-2020 17:31:03
 Updated: 17-11-2021 16:35:55

Fragestellungen bei der Integration von EULYNX

- Wie ist die Formatbeschreibung?
 - XSD vorhanden
 - <https://dataprep.eulynx.eu/2022-01/index.htm?goto=3:3:3:11273>
 - <https://dataprep.eulynx.eu/2022-01/>
- Erklärung von Zusammenhängen
 - **Hintergrundinformationen** notwendig
- Programmumsetzung
 - EULYNX != Programminterne Logik



BIM/IIM ist umfassender als 3D/4D/5D/...-Modellierung und Visualisierung sowie **softwareübergreifend**

EULYNX bildet erforderliche Fachobjekte nach BIM **logisch** ab, **geometrisch** fehlen noch Bauteile

Mehrwert entsteht erst durch

- **Vollständige Vernetzung** aller Fachobjekte in genau einem Gesamtmodell
- **Reproduzierbarkeit** und **Erweiterbarkeit** der Modelle und Analysen

Größte Herausforderungen sind

- **Bildung** und **Vereinheitlichung** der Fachobjekte (Bauteilbibliotheken)
- **Technisches Fachwissen (Bahn)** kombiniert mit **Informatik**
- **Übergreifendes Fachwissen**