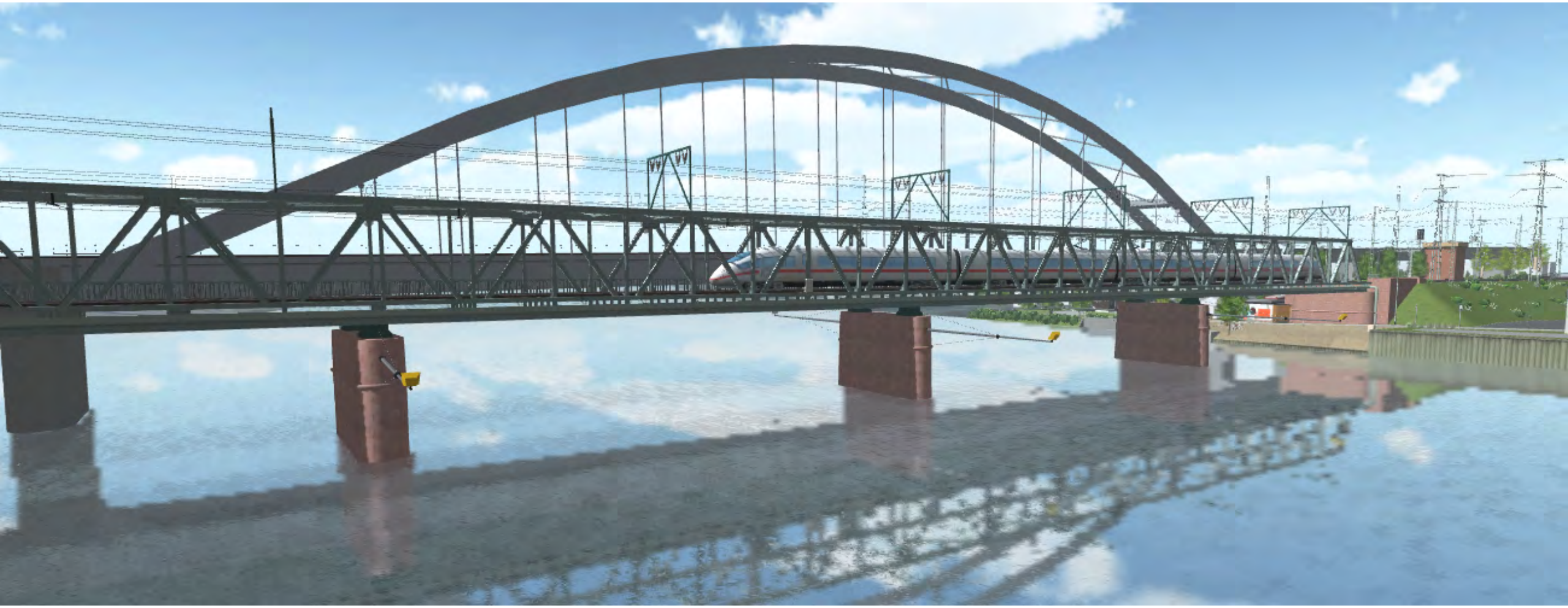
LocLab
THE DIGITAL TWIN COMPANY



Company Brochure

At a glance..

Our digital twins will revolutionize your business processes. As object-based virtual images of existing or planned buildings, technical facilities or entire cities, they provide a completely new intuitive access to your assets. In addition to semantics as a prerequisite for system links, data analyses and simulations, our models are characterized by extremely high runnability, the smallest data volumes and a remarkably realistic appearance. Our models run on standard hardware, mobile devices and in web-based applications.

This is made possible by intensive experiences from the games industry and the use of artificial intelligence.

Wherever our digital twins are operating: they form the modern basis for sound decisions.

Our Core Business

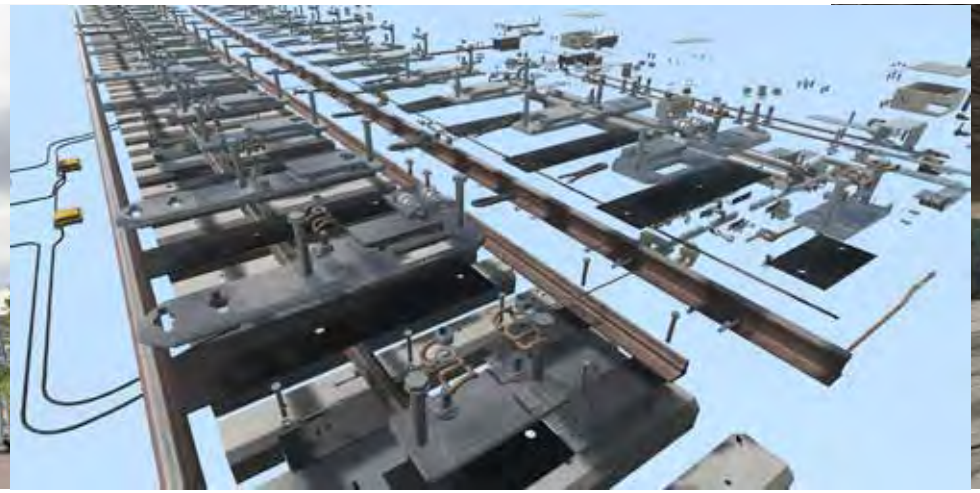
We create "Digital Twins" - virtual copies of existing or planned assets and spaces, three-dimensional, vectorized and semantic.

Digital Twins are increasingly used across many industries, mostly in transport, energy, nuclear, telecoms, maritime, aviation and security. The market is global and growing.

Use cases of our Digital Twins comprise public consultation, visualisation, processes and design optimisation, simulation, data integration and asset management.

Our USPs

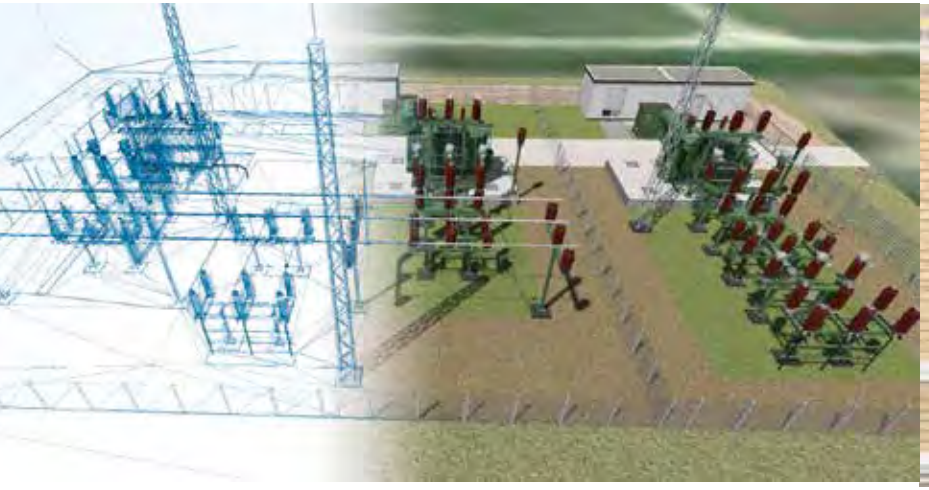
- **Quality:** We don’t produce nice looking renderings. We create object-based vector models with a stunningly low data load.
- **Use of AI:** Our products are created using AI with a high degree of automation. We use image-based object and pattern recognition and can thus generate 3D models from normal photos or videos in high quality and with a wide range of applications.
- **Scalability:** The exceptionally high degree of automation in our digital production process works at any scale, from city models to "nuts and bolts".

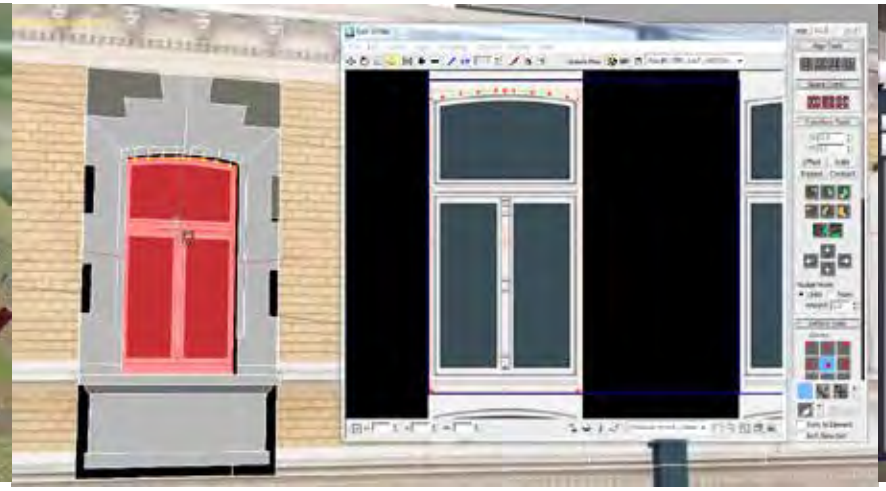



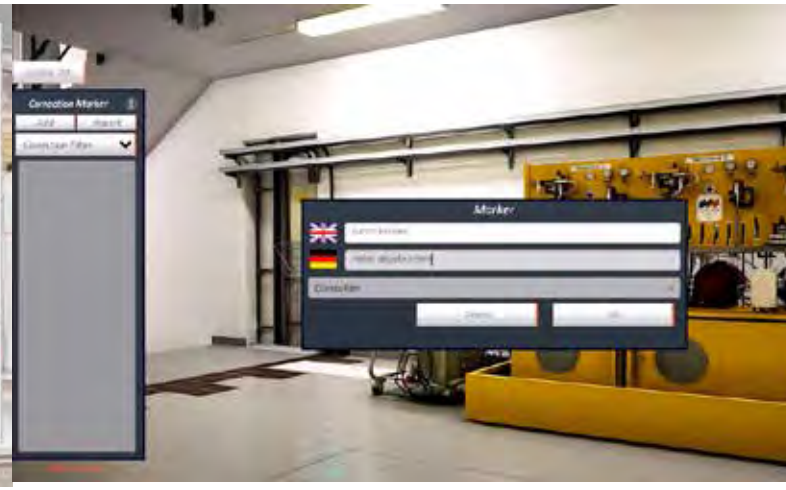

Our Technology

We have the technology for the needs of a digitalised industry

- A **vast object library** is at the heart of our technology, containing digital representations of real world objects.
- Our vendor-neutral **ToolChain** is like an assembly line of algorithms, enabling an outstanding degree of automation in the digital production process. We use deep learning software to train our algorithms to become more efficient with every project.







Who are we?

- We are specialized in technical 3D applications and gamification in the construction sector. With our extensive experience in BIM and data modeling we know what 3D and games engines can do
- Consultants with extensive experience in BIM, GIS and Asset Management
- Concentrated 3D experience from over 3700 projects

What do we offer?

Data, 3D models and programming services, for example

- 3D models of the built environment in our 3D data viewer for visualization
- 3D, volumetric and object-based BIM models based on open standards
- High-detail technical models (vehicles, plants, machines) for VR, training and process optimization
- GIS-based applications, for example way finding
- Apps

Our Clients and Partners

LocLab CONSULTING

Activity Areas

- Real-World Modelling
- 3D-Production
- Programming

Services

- Real time rendering/ VR
- Interactive 3D-models
- Artificial Intelligence
- Physics Engine
- Animation
- Data capture
- As-built models
- Design models
- Sandbox-Functionality
- Semantisation
- Data finishing and improvements

Technology

- Terrestrial photogrammetry
- WebGL
- Videogrammetry
- CAD, GIS and other 3D data
- Attribution of 3D models
- Linking databases and IoT
- SAP linkage
- Services (on-/offline)

Application

- Stakeholder Engagement
- Simulation
- Process and Design Optimization
- Training
- Data Integration
- Asset Management

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3D Production

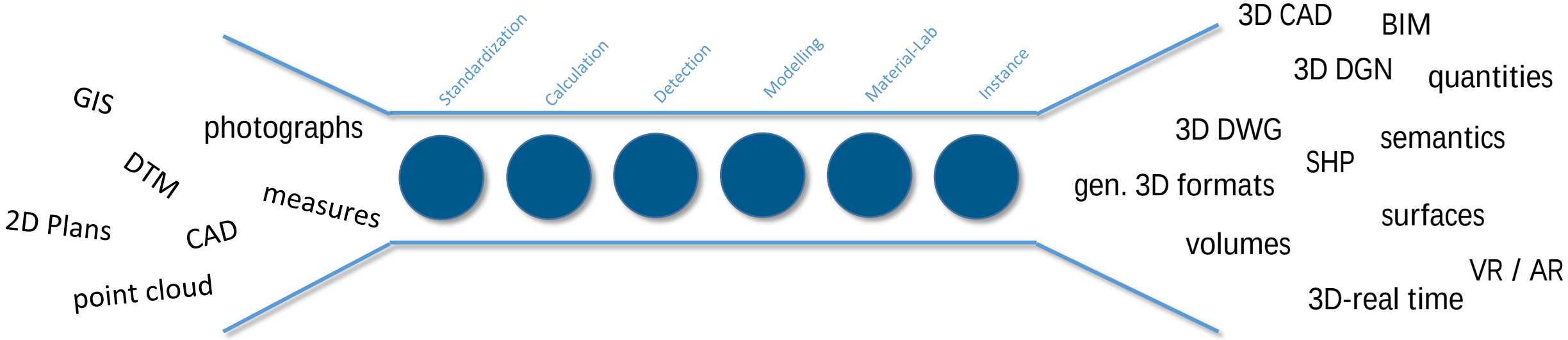
We deliver to your requirements. Our data models are

- Stunningly realistic
- Software independent
- Surface or volumetric models as required
- Semantic and object-based as required
- Delivered with our 3D Rocket data viewer or in an editable format as required
- As accurate and detailed as required

AI-based 3D production

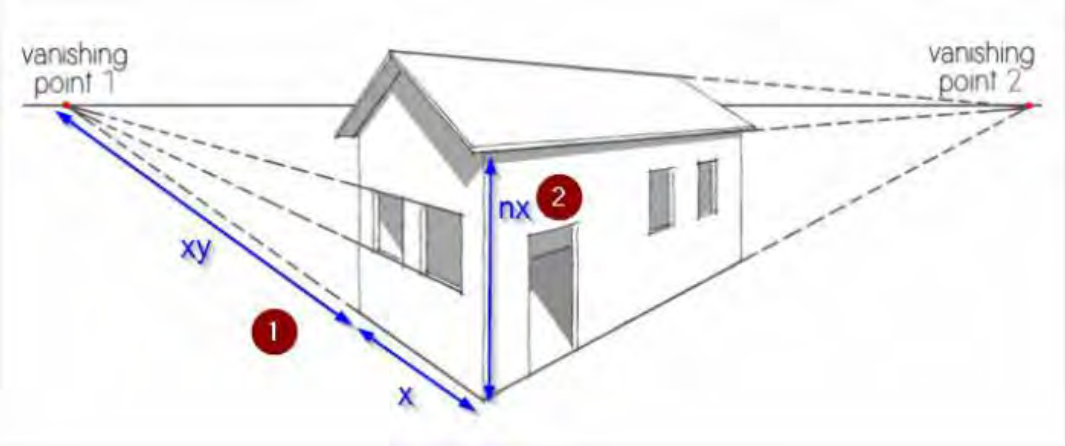
3D Production:

- In-house developed ToolChain for semi-automated data processing and modelling
- Data synchronizing and –standardization
- Calculations based on terrestrial photogrammetry
- Detection-software (pattern recognition)
- Use of structured libraries

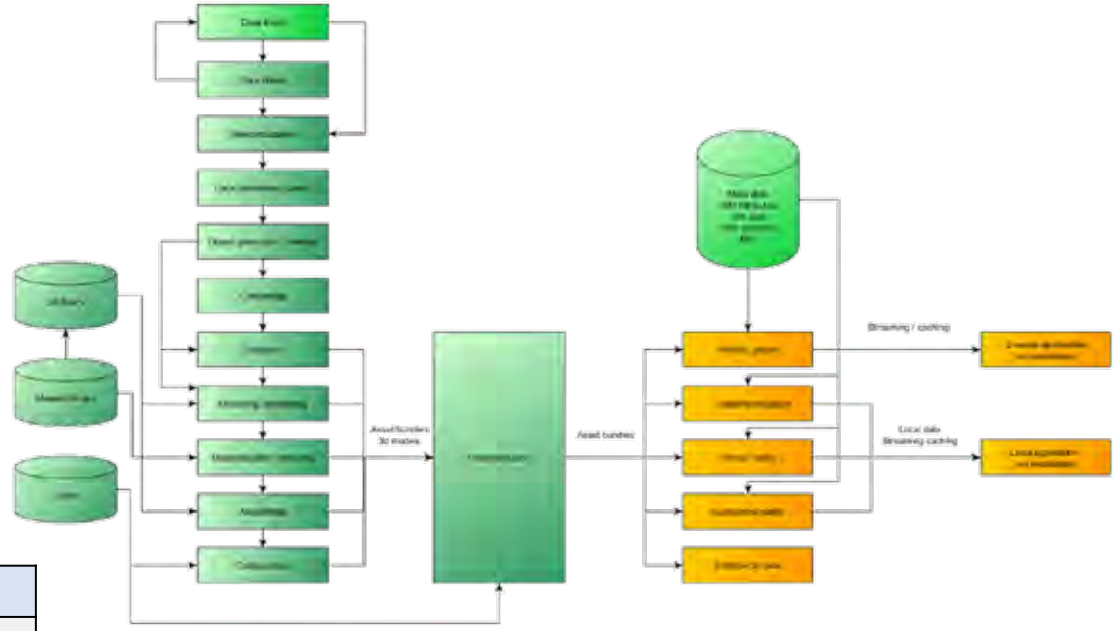


AI-based 3D production

Step 1: creating the 3D geometry based on the principles of descriptive geometry



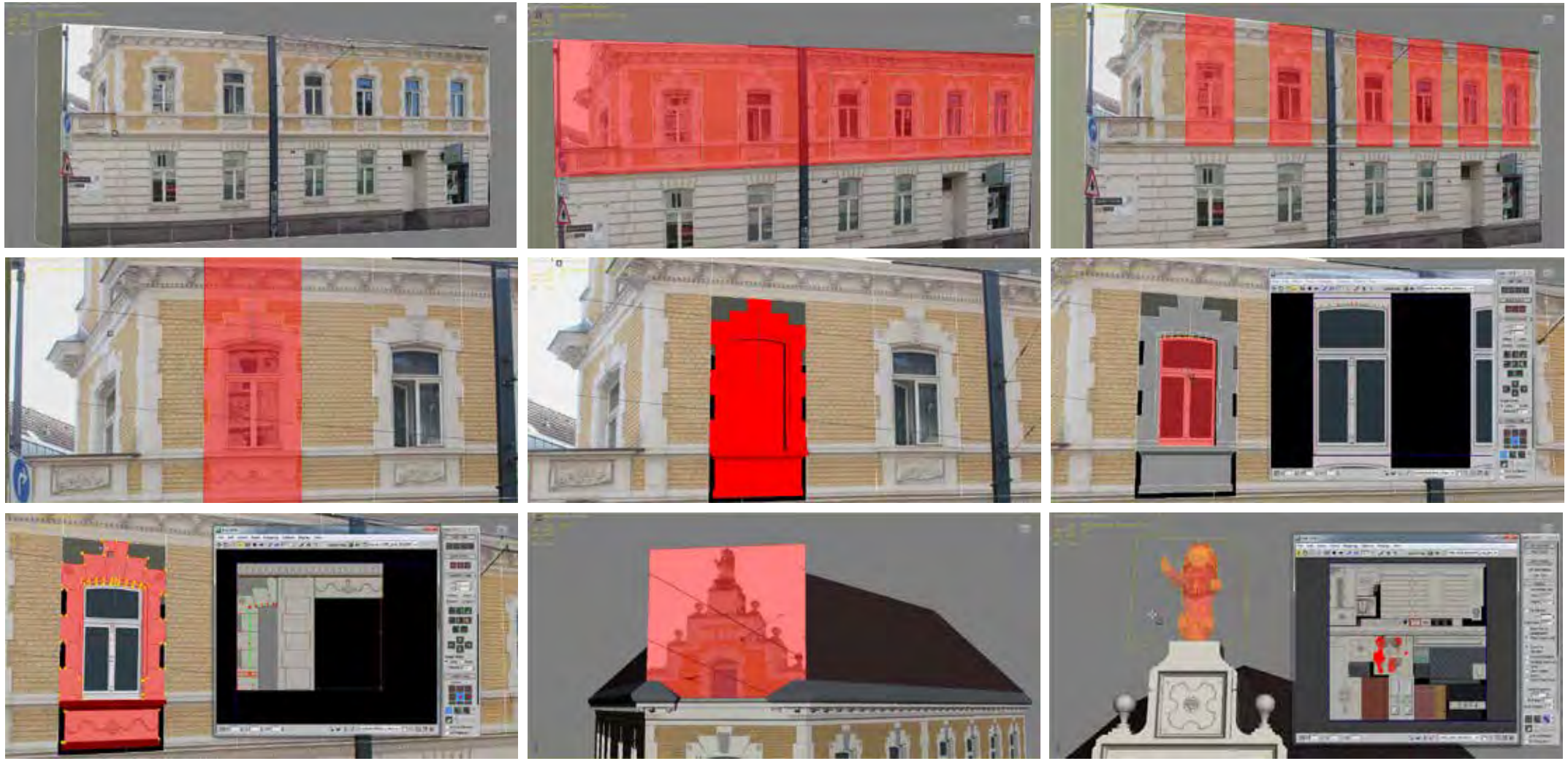
Step 2: Vector, material and object recognition and instancing



Library structure

Type		Description
Global		Objects that are globally the same (i.e. concrete, a car etc.)
UK DE CH	Regional	Objects that are specific to countries (i.e. traffic lights, road signs etc.)
Local		Objects that are unique (i.e. a house etc.)

AI-based 3D production



AI-based 3D production

3D production / data capturing:

- We use a variety of data capturing methods for the production of 3D models, from quick-but-not-at-all-dirty to high accuracy and detail
- Level of Detail and Level of Accuracy can vary to meet the specified requirements

3D City Model: Resolution 10 cm,
Accuracy: 10 cm

Station: Resolution 10 cm,
Accuracy: 1 cm

AI-based 3D production

3D production / data capturing / terrestrial photogrammetry:

- Only photographs and a few reference measurements or 2D plans are required for the development of our 3D models with a resolution of 10 cm. Objects are detected automatically and replaced with instances from our library

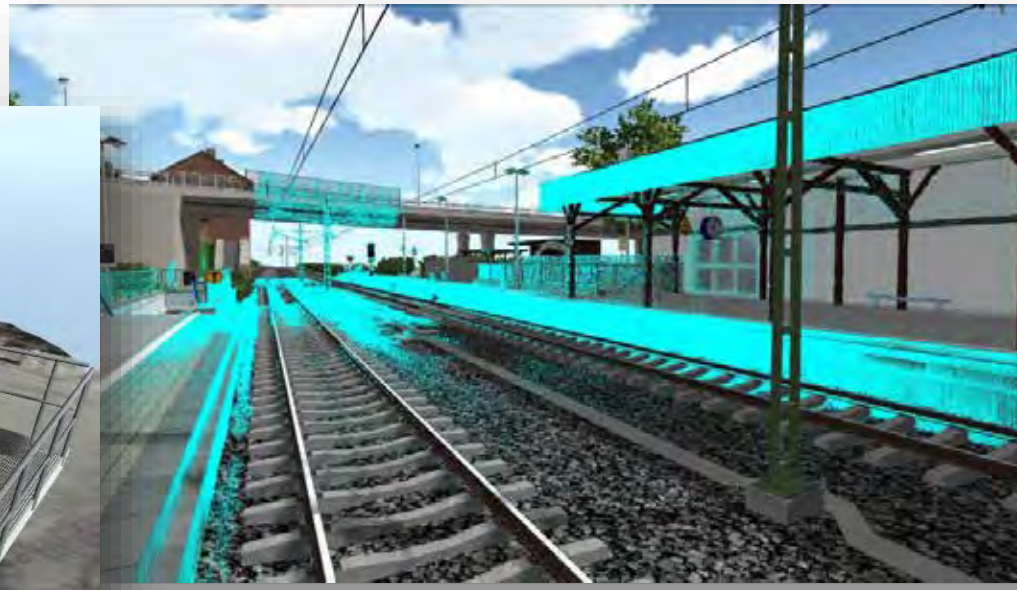
Photographs + reference measurements = 3D model

AI-based 3D production

3D production / data capturing / laser-scan:

§ Algorithms combined with terrestrial photogrammetry transfer laser-scan point clouds directly into 3D models, no meshing required

From point cloud
to 3D model



3D model of a station with point cloud

AI-based 3D production

3D production / data capturing / plans and traditional surveys:

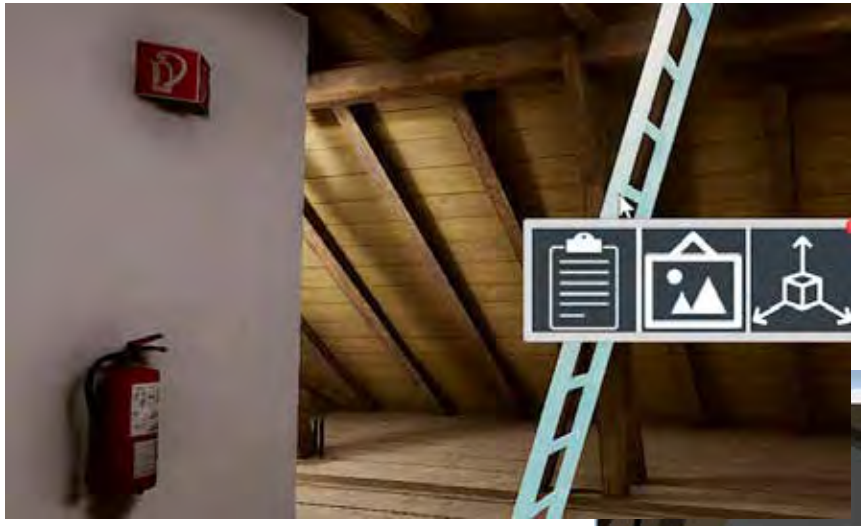
- Traditional survey data and 2D plans can also be used as input data for our semi-automated 3D modeling process

From 2D design to 3D model

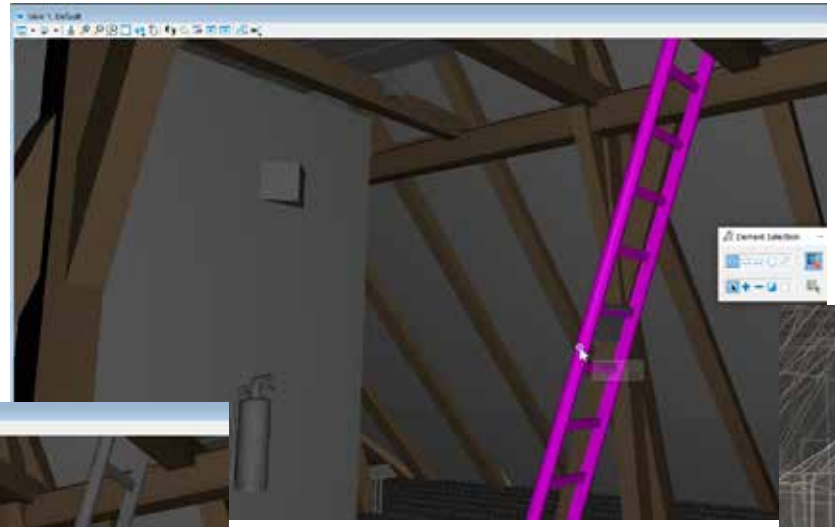
AI-based 3D production

3D production / 3D CAD, GIS and BIM:

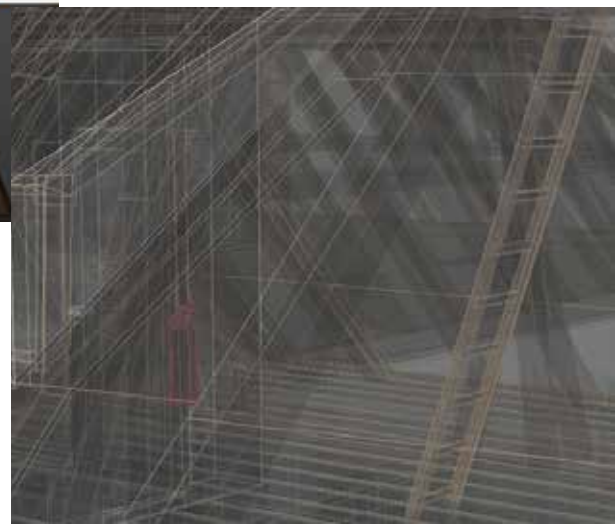
- Our ToolChain is software independent. We produce data models in almost any required file format (CAD, BIM, GIS)



3D model in 3D Rocket Player



3D model in a CAD software with object-based structure



Programming

Applications and customization for

- Visualization
- Simulation
- Semantization
- Gamification

Visualization

Programming / Visualization:

- Visualize design options
- Understand and communicate scenarios

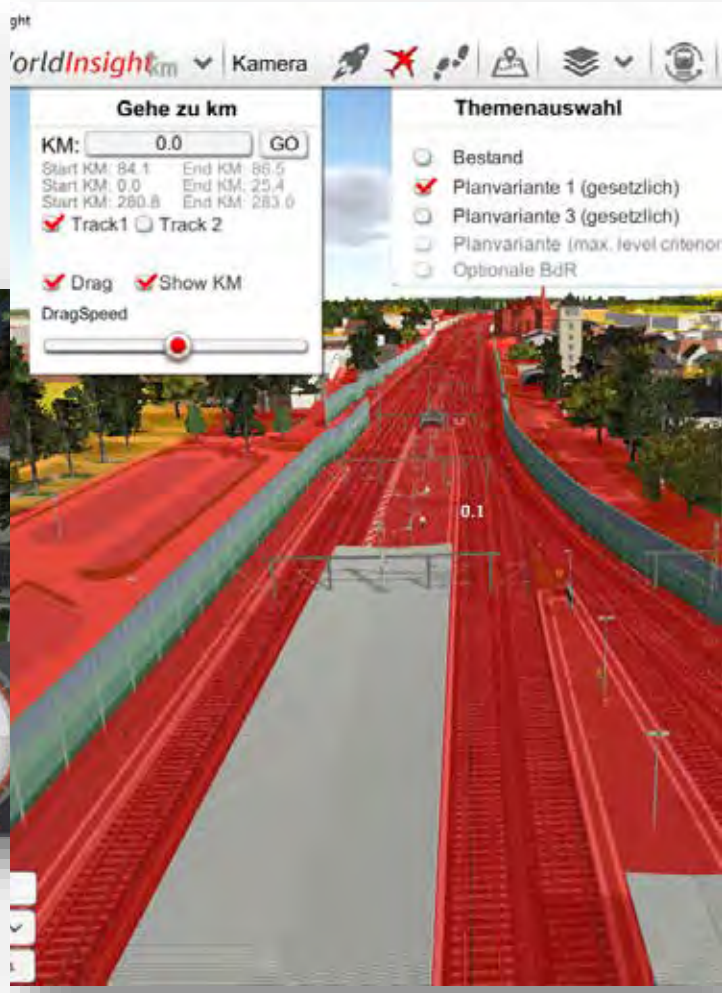
Simulation

Programming / Simulation:

Game-engine based programming for technical applications:

- Fully interactive 3D applications
- Artificial intelligence (AI)
- Animations (with physics)

Daylight simulation
for road design



Noise Visualisation

Semantization

Programming / Semantization:

- Linking various data sources (SAP, Oracle spatial, SQL, mySQL etc.) and 3D models
- Attribution of object-based, semantic 3D models
- Automated creation of additional metadata / attributes for components within the 3D models for example as numeric values

Gamification

Programming / Gamification:

- Simplifying and optimizing processes using intuitive methods and animations
- Increase staff motivation and acceptance by mimicking real-world scenarios and behaviors
- Development of biotic and abiotic animations (Key-frame, action-based, event-based)

Virtual train model for training and process optimization

Use Cases

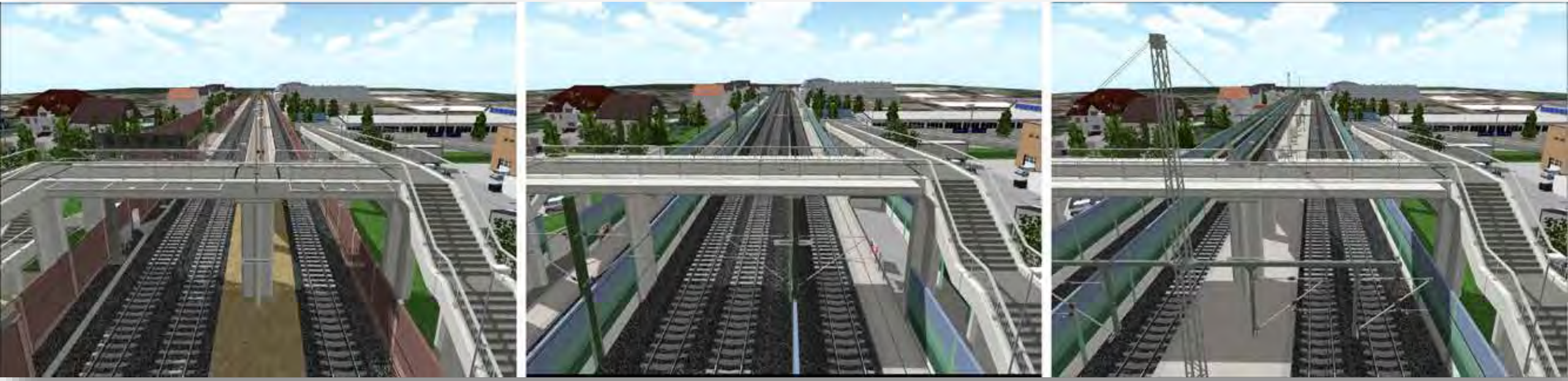
Our focus is on solutions in the following areas:

- Stakeholder Engagement / Political Mediation
- Simulation
- Training
- Process Optimization
- Facilities and Asset Management (hand-over, maintenance, etc.)

Use Cases

Political mediation / stakeholder engagement:

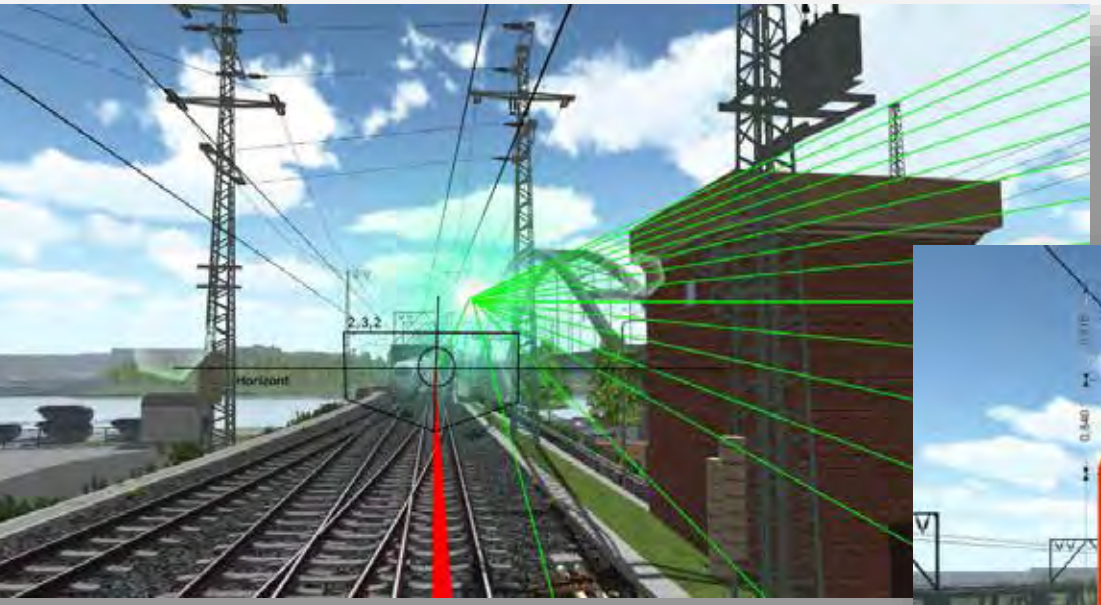
- Design simulation in our game engine allows to navigate through the 3D model and look from individual viewpoints
- Settings can be changed interactively whilst navigating through the 3D model, for example the height of noise barriers, changes in materials or colors, different scenarios, etc.



Use Cases

Simulations:

§ Our technical simulations support the verification of functional design performance



Signalling line of sight verification

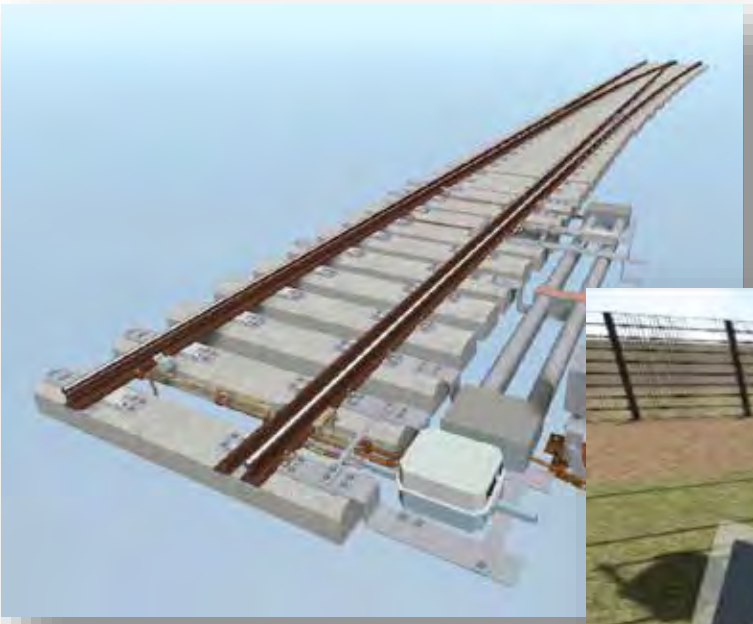
Track geometry and gauging

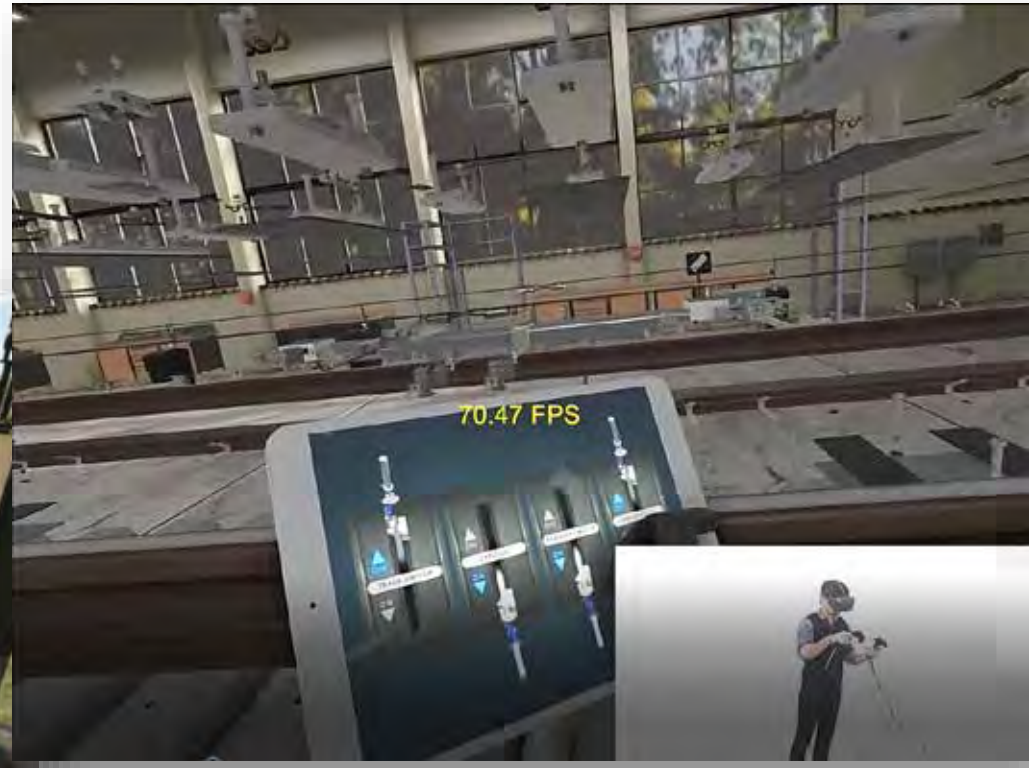
OHL

Use Cases

Training / Virtual Reality

§ Our virtual models can be used for training purposes and reduce time on-site.

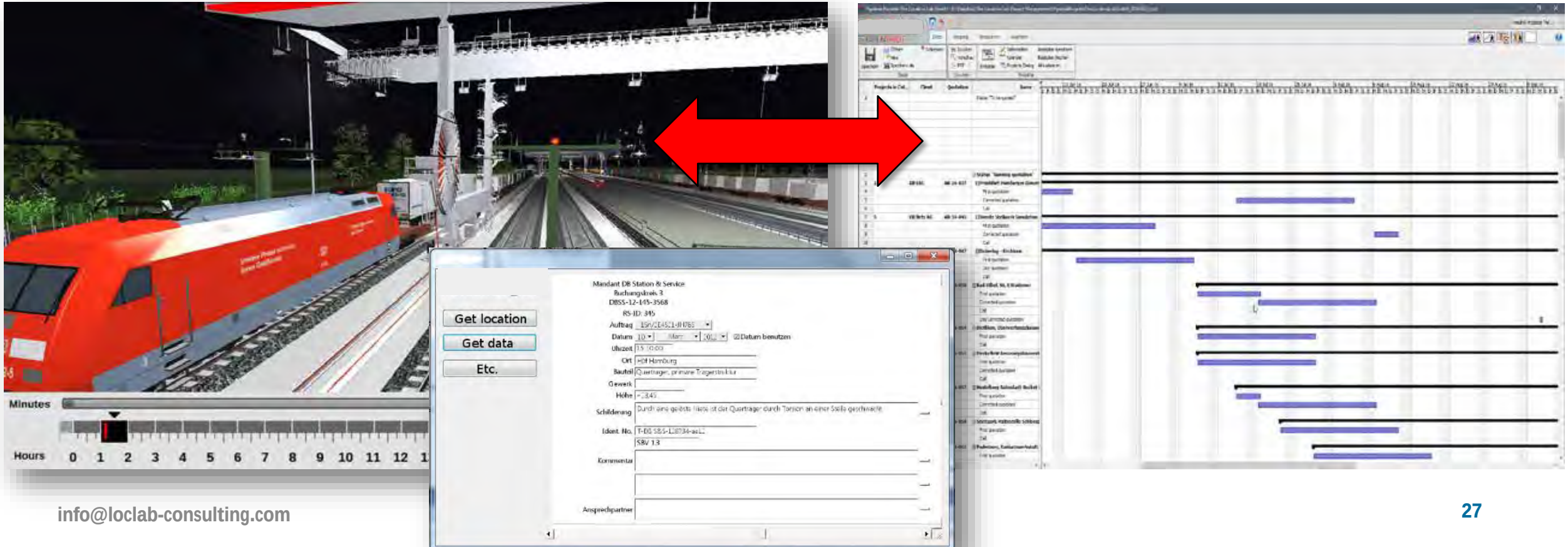




Use Cases

Process Optimization:

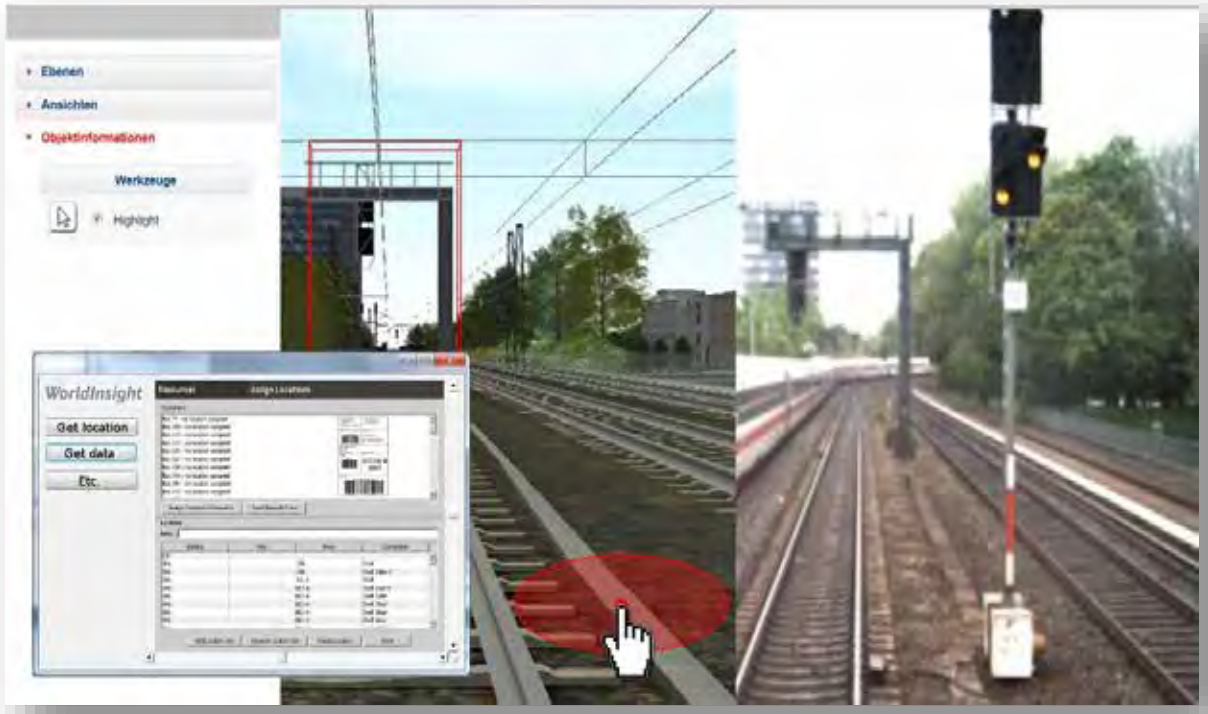
- Construction sequencing, clash-detection and not-suitable-functions improve the quality and maturity of design and planning before construction starts. Health & safety relevant rules can be incorporated.

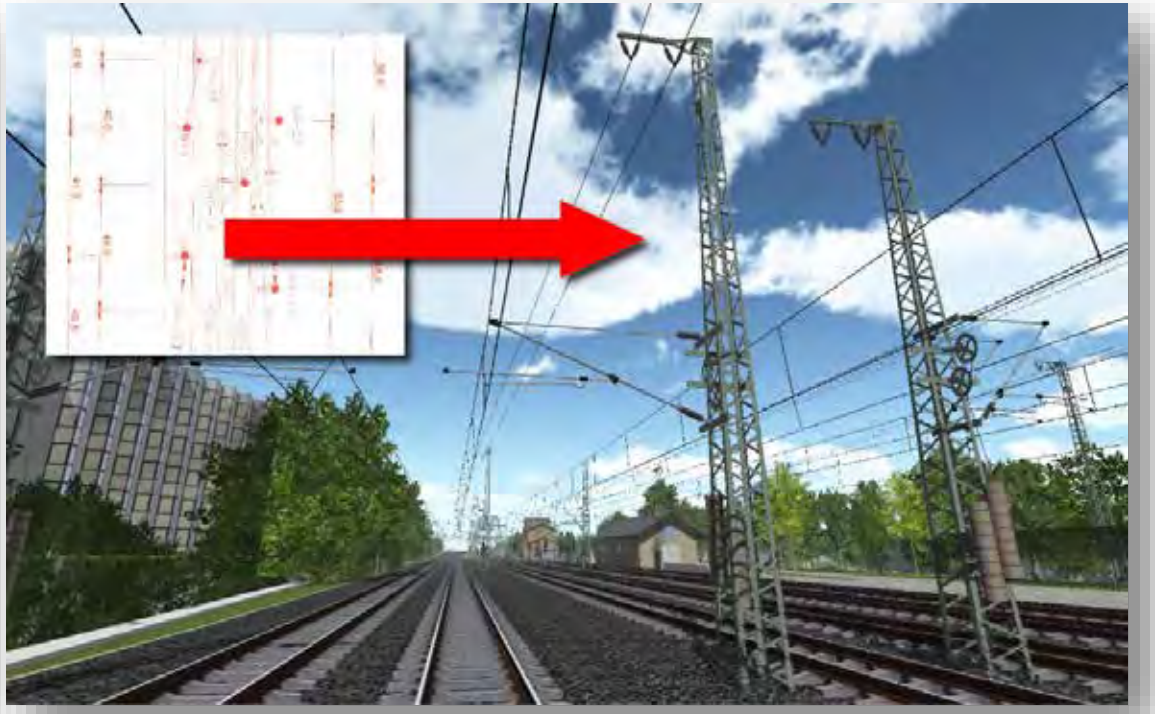


Use Cases

Asset Management

§ Tablets or other devices can be used to interrogate our 3D models. Information about individual components, spaces or technical equipment can be retrieved directly from the source system such as SAP, databases, Excel etc. Processes and services can be triggered directly from the model.

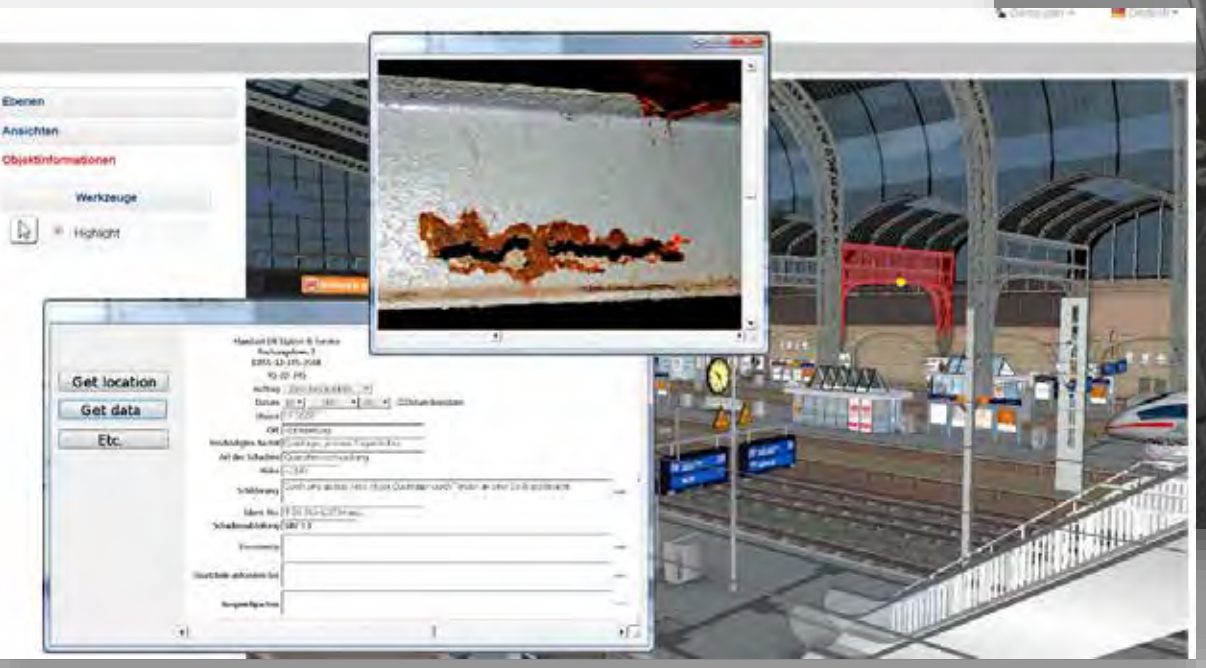




Use Cases

Asset Management

- Maintenance intervals and down-times can be reduced significantly through damage reports in our models



Leakage detection

Equipment and tools lists provided

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