



CASE STUDY  
TRANSPORTATION

# Deutsche Bahn: From Manual 3D Modeling to a Digital Twin Foundation

How DB Systel GmbH replaced manual modeling with scan-to-mesh digital twins, digitizing hundreds of rail stations at enterprise scale.

CLIENT  
Deutsche Bahn (DB Systel GmbH)

CONTEXT  
Rail Infrastructure & Operations

# Scan to Mesh: A Scalable 3D Foundation for Every Station

Deutsche Bahn manages one of Europe's largest and most complex infrastructures — thousands of stations, facilities, and assets that require constant maintenance, inspection, and modernization.

DB Systel GmbH is a wholly owned subsidiary of DB AG and the driver of digitalisation for all Group companies. To achieve its vision of a scalable 3D foundation for every station, DB Systel's Immersive Technology team needed a consistent, cost-effective way to turn real-world conditions into usable 3D environments.



What followed was a scalable 3D digital twin program that cut on-site time, connected spatial data to SAP PM, and gave maintenance and operations teams a virtual window into every station on the network.

**CLIENT**

DB Systel GmbH,  
Deutsche Bahn

**PROJECT**

Scan-to-mesh  
station digitization

**SCOPE**

Automated meshing,  
SAP PM, Revit

**INDUSTRY**

Transportation / Rail

# The Challenge: Turning Data into Usable Reality

DB Systel GmbH explored several methods to create accurate 3D representations of its stations and facilities, but each fell short of delivering the consistency and scalability required.

## 01 BIM models

Too rigid and time-consuming for existing facilities — teams couldn't easily update or validate changes.

## 02 Manual modeling

Photo-reference modeling was inconsistent and costly, making it difficult to scale across DB's vast network.

## 03 Fragmented workflows

3D data was hard to link to operational systems like SAP and maintenance management tools.

### Without an automated 3D modeling pipeline

- ✧ BIM models too rigid for existing facilities
- ✧ Manual modeling impossible to scale across thousands of sites
- ✧ 3D data disconnected from SAP and maintenance systems
- ✧ Technical bottlenecks limiting access to spatial data

**"We had the data, but not the means to make it usable at scale."**

**Jonas Heidecke**

Requirements Manager, DB Systel GmbH

# The Solution: Prevu3D's Scan-to-Mesh Engine

DB Systel GmbH partnered with Prevu3D to address the core technical challenge — automating the transformation of raw scan data into a solid, scalable, and interoperable 3D model.

## WITH REALITYPLATFORM™, DB SYSTEL CAN NOW

- ✓ **Ingest point clouds and 360° captures** from LiDAR, SLAM, or photogrammetry sources.
- ✓ **Automatically generate meshes** that are lightweight, accurate, and instantly viewable through a web browser.
- ✓ **Connect the visualization to SAP PM** and other enterprise systems through an open API framework.
- ✓ **Enable non-technical users** — from facility managers to maintenance staff — to visualize, measure, and collaborate in real time.

**“Changes due to repair measures, conversions, and redesigns can be easily implemented in 3D visualization.”**

DB Systel GmbH, Facility Management Workshop (BIM to Operations Program)

This confirmed that the Scan-to-Mesh workflow could flexibly adapt to real-world change — turning static scans into living, updatable models that scale across DB's network.

## With Prevu3D's Scan-to-Mesh Digital Twin Engine

- ✓ Automated mesh generation from any point cloud or 360° source
- ✓ Direct integration with SAP PM and Revit through open connectors
- ✓ Consistent 3D models deployable across DB's entire network
- ✓ Any stakeholder can access, measure, and collaborate in a browser

## Results: From Proof-of-Concept to Platform Strategy

Through functional testing conducted jointly by DB Systel GmbH and Prevu3D, DB confirmed key hypotheses:

3D visualizations can be easily kept up to date.

Repairs, conversions, and redesigns can be implemented directly in 3D.

On-site visits are reduced, accelerating maintenance and inspection.

SAP PM data is more accessible through visual context, improving usability and data quality.

These results have solidified 3D visualization as a foundational element of DB Systel GmbH's facility management strategy, with measurable efficiency gains across core processes:

|                                 |                         |                                           |
|---------------------------------|-------------------------|-------------------------------------------|
| 01<br>Inventory data collection | 02<br>On-site briefings | 03<br>Construction-to-operation handovers |
|---------------------------------|-------------------------|-------------------------------------------|

“For facility management, the question is no longer whether to use 3D visualization, but how to use it effectively.”

DB Systel GmbH

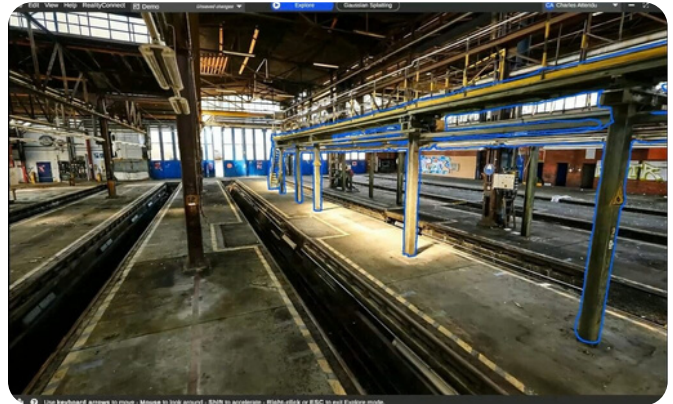
Immersive Technology – Reality Capture

## Why It Works

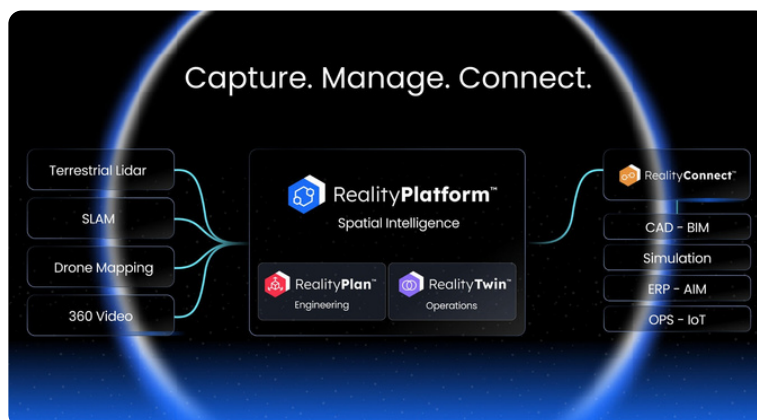
Prevu3D unifies data fidelity with usability, while delivering the scalability needed for enterprise-wide deployment.



- Scan-to-Mesh pipeline** eliminates the manual modeling bottleneck, processing large volumes of scan data with consistent quality.
- The Prevu3D ecosystem** provides the technical and operational layers DB needed: automated meshing, RealityPlan™ editing tools, and web-based access.
- Integration with SAP PM and Revit** ensures 3D data isn't isolated but part of the broader digital operations ecosystem.
- Data democratization** — every user, in the field or the office, can access, measure, and collaborate in 3D. Minimal training, standard PCs, easy sharing with partners.



## Looking Ahead



With RealityPlatform™ now integrated into its 3D visualization initiative, DB Systel GmbH is expanding the Scan-to-Mesh workflow across more stations and facility types. The next phase connects 3D environments more deeply into the building lifecycle — linking planning, construction, and operations through BIM and SAP PM.

## Key Benefits at a Glance

| AREA                 | PREVIOUS APPROACH                     | WITH PREVU3D                                                                                   |
|----------------------|---------------------------------------|------------------------------------------------------------------------------------------------|
| 3D model creation    | Manual modeling, inconsistent results | Automated, scalable mesh generation                                                            |
| Data accessibility   | Limited to technical teams            | Accessible via web viewer for all stakeholders                                                 |
| Maintenance planning | Repeated on-site visits               | Remote inspection and measurement                                                              |
| System integration   | Disconnected from SAP and BIM         | Linked through open connectors                                                                 |
| Facility workflows   | Paper-based or visual documentation   | Centralized 3D visualization and handover, with significant time savings across core processes |

### RealityPlatform™

Ingests point clouds and 360° captures, automatically generates web-viewable meshes, and shares them securely.

### RealityPlan™

Editing tools to implement repairs, conversions, and redesigns directly in the 3D environment.

## About Deutsche Bahn

Deutsche Bahn is Europe's largest rail operator, managing over 5,000 stations and extensive passenger and cargo networks across the continent. DB Systel GmbH is a wholly owned subsidiary of DB AG and the driver of digitalisation for all Group companies.

With its holistic offering, the company drives the digitalisation of business processes and rail-specific digital solutions, creating excellent customer experiences with strong customer benefits.

Within DB Systel's Immersive Technology Team, the goal is clear: digitize the as-built stations and create an operationally reliable 3D visualization environment to connect engineering, maintenance, and operations.



### ABOUT PREVU3D

Prevu3D, a Montreal-based tech company founded in 2017, is dedicated to leveraging the physical world to drive work efficiency and innovation. Our intuitive software bridges reality to the digital world, offering the most accurate representation of facilities for engineering, maintenance, and operational needs.

**Automate your scan-to-mesh workflow and reduce site visits.**

Book a meeting with our experts >

[prevu3d.com](https://prevu3d.com)