



# twinverse

**Industrial metaverse with 3D reality models**

# Industrial metaverse defined

Metaverse:

The next step in the evolution of the Internet providing virtual 3D spaces where users can interact with digital content and other users

Industrial Metaverse:

3D digital replicas of industrial environments, systems and assets that can be used to monitor, interact with, and control their physical counterparts collaboratively in real-time and independent of location

Building blocks:

1. 3D model of the site
2. connection to environment, system and asset data
3. platform for accessing the data via the 3D model





# Twinverse's focus

## Asset information management:

- Location-based access to device information in asset management or maintenance system
- Linking PI diagrams with real world: device locations and contexts

## Information for workers:

- Onboarding new employees with a guided tour
- Work and safety instructions
- Guidance and monitoring for critical activities

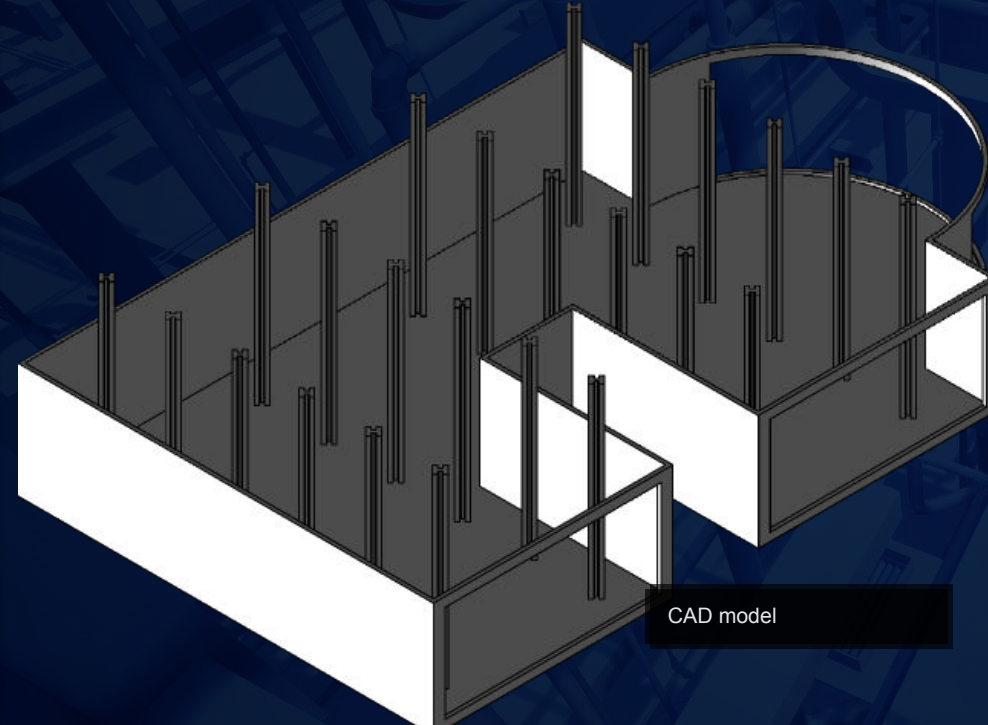
## Installation, maintenance and demolition planning:

- Hauling routes
- Fitting new equipment
- Visualizing planned changes
- Maintenance planning: picking right tools, planning work remotely



# Does correspondence to reality matter?

CAD drawing as a basis for the 3D digital replica



CAD model

- + Green field designs
- + Good when focus is in design data of a specific unit

Reality model as a basis for the 3D digital replica



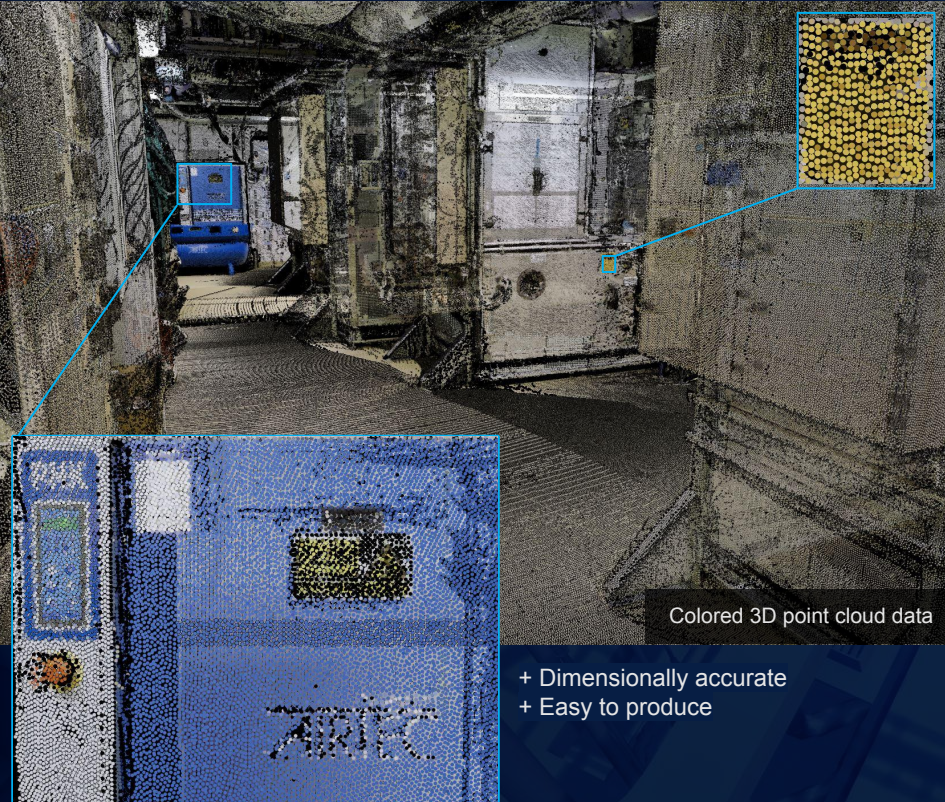
Textured 3D mesh model

- + Shows context
- + Shows details like texts
- + Shows things that are not designed
- + Feeling of being physically present
- + Fastest option when no CAD model available



# Does visual accuracy matter?

Typical laser scanning result



State-of-the-art photogrammetry + laser scanning result





# Does reality matter?

Imaginary environment



Real environment



+ Training location independent skills

+ Doing everything in your own environment



# Are 360° images enough?

360° images with links and map



- + Easy to produce
- + Good in giving an overview with simple 2D content
- + Animations in 2D

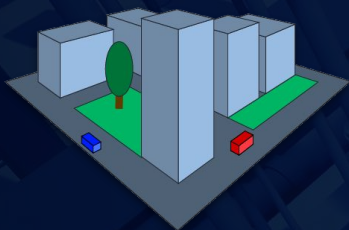
3D reality model



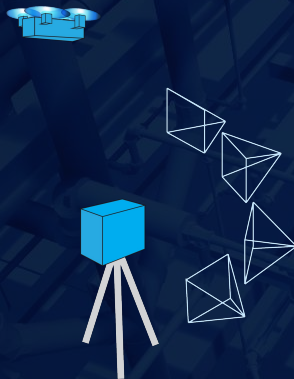
- + Free moving in all directions
- + 3D content
- + Animations in 3D

# Industrial metaverse implementation with Twinverse

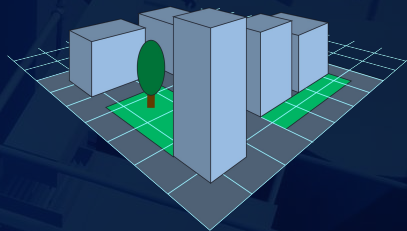
Your own  
real-world  
environment



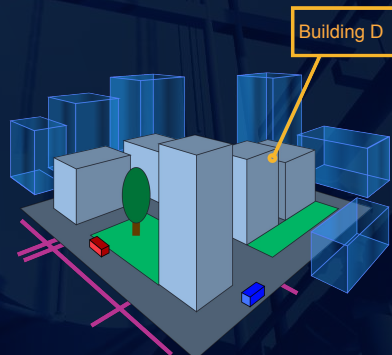
Reality capture  
with drone,  
camera, laser  
scanner



Automated  
3D model  
creation



Twinverse web  
platform for the 3D  
model and content



Your use cases

Plan and visualize changes, manage assets in 3D, onboard new employees, provide work and safety instructions, ...



## Reality models

Visual fidelity and geometric accuracy  
from textured 3D mesh models



Feature extraction from  
3D point clouds



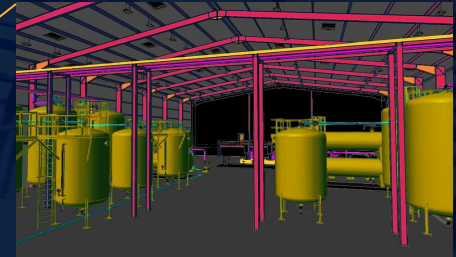
+ Rapid situational awareness from  
360° images

## Case specific content

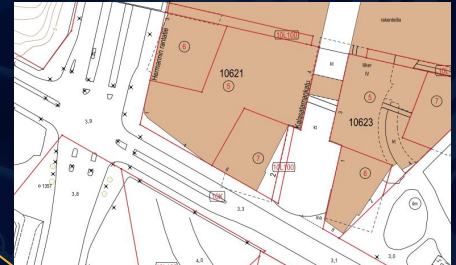
texts, documents, drawings,  
photographs, videos, 3D models

## Supplementary data

CAD models, designs  
and drawings



Maps, layouts, plans and other  
spatial data

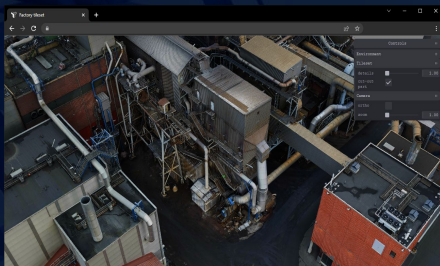


+ Other documents, pictures,  
videos and data streams

**Twinverse  
collaborative  
web platform**

Change planning  
Asset management  
Training

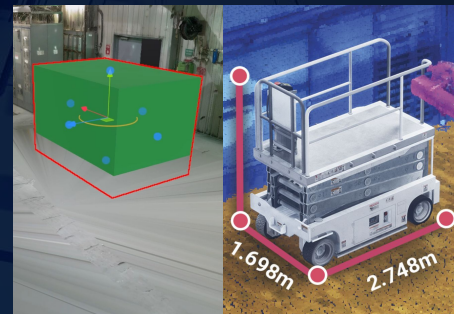
**USE CASES**



Visit your sites via  
photorealistic 3D  
models or 360°  
pictures in a viewer



Check and measure things,  
update drawings and  
diagrams



Fit new equipment

# Virtual Visits

Access and understand your site remotely

Access location-based  
documentation or  
information via the  
model



Visualize production line  
operation and real-time data  
(digital twin)

Add training content:  
Information, incidents,  
questions, tasks



Add notes about  
safety risks





# twinverse

Improving your operations with 3D and data