



twinverse

Industrial metaverse on factory floor 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 users can control, communicate, and interact with collaboratively in real-time, regardless of their physical location

Building blocks:

1. digital replica of an industrial environment
2. information added in various locations in 1
3. platform to use 1 and 2



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

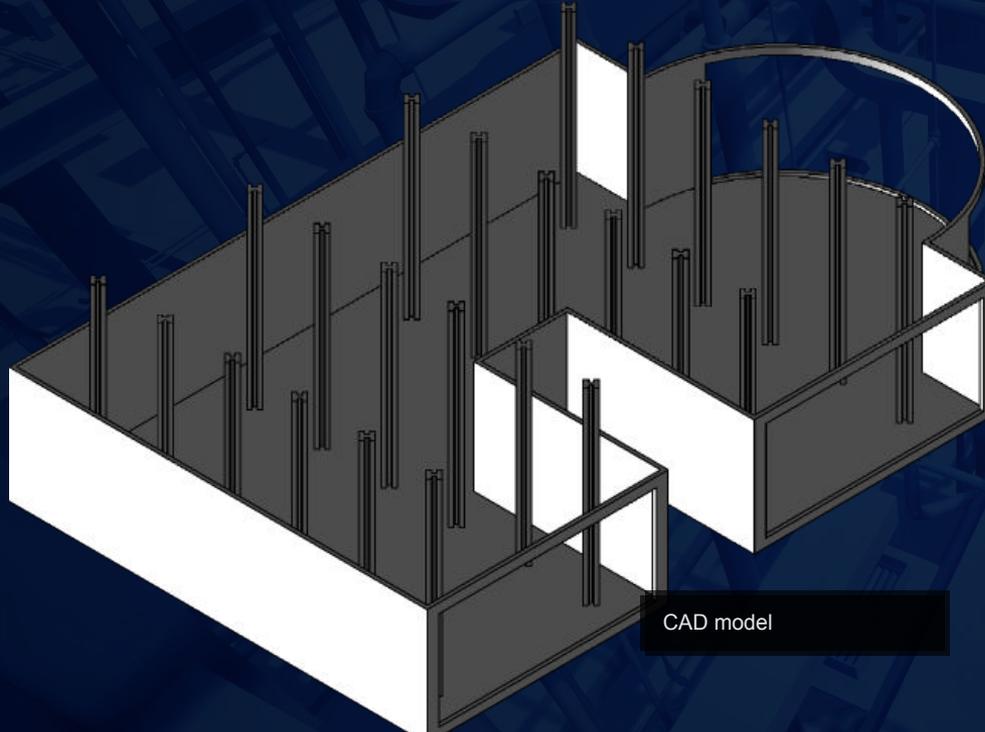
Installation, maintenance and demolition planning:

- 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

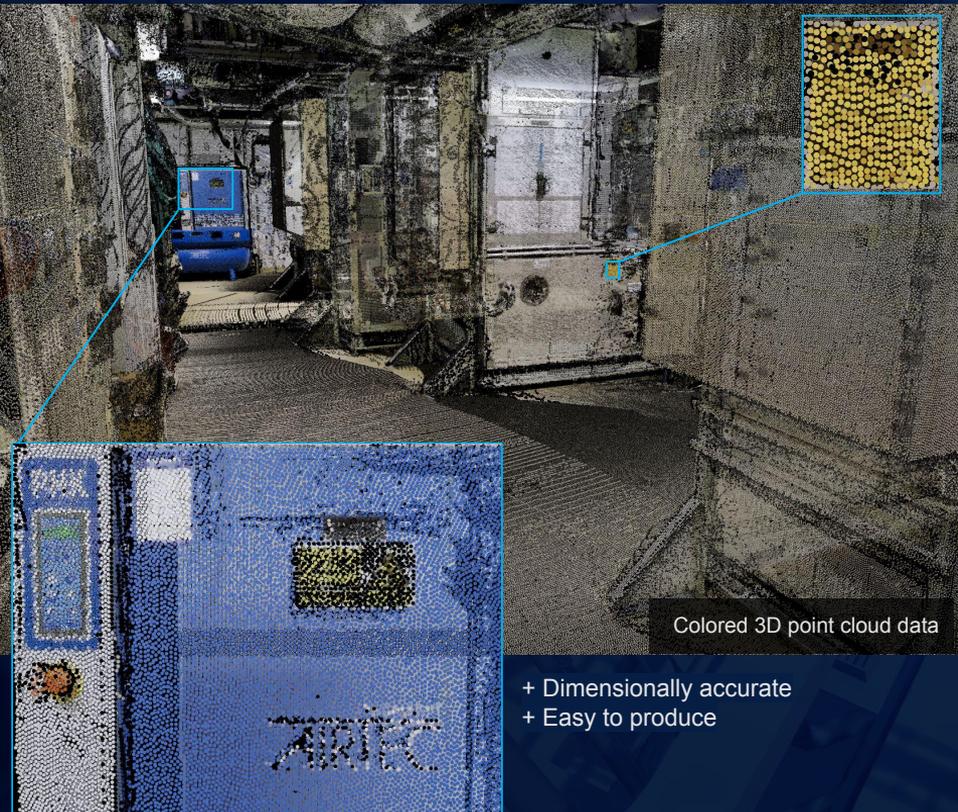


Textured 3D mesh model

- + 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

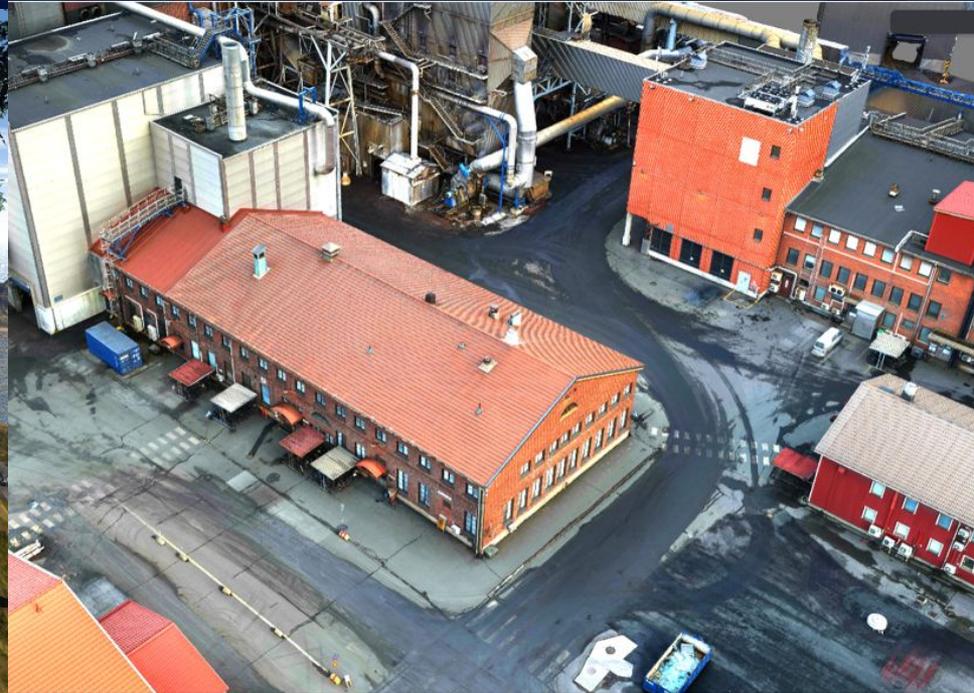


Does reality matter?

Imaginary environment



Real environment



+ Training location independent skills

+ Doing everything in your own environment

Are 360° images enough?

360° images with links and map



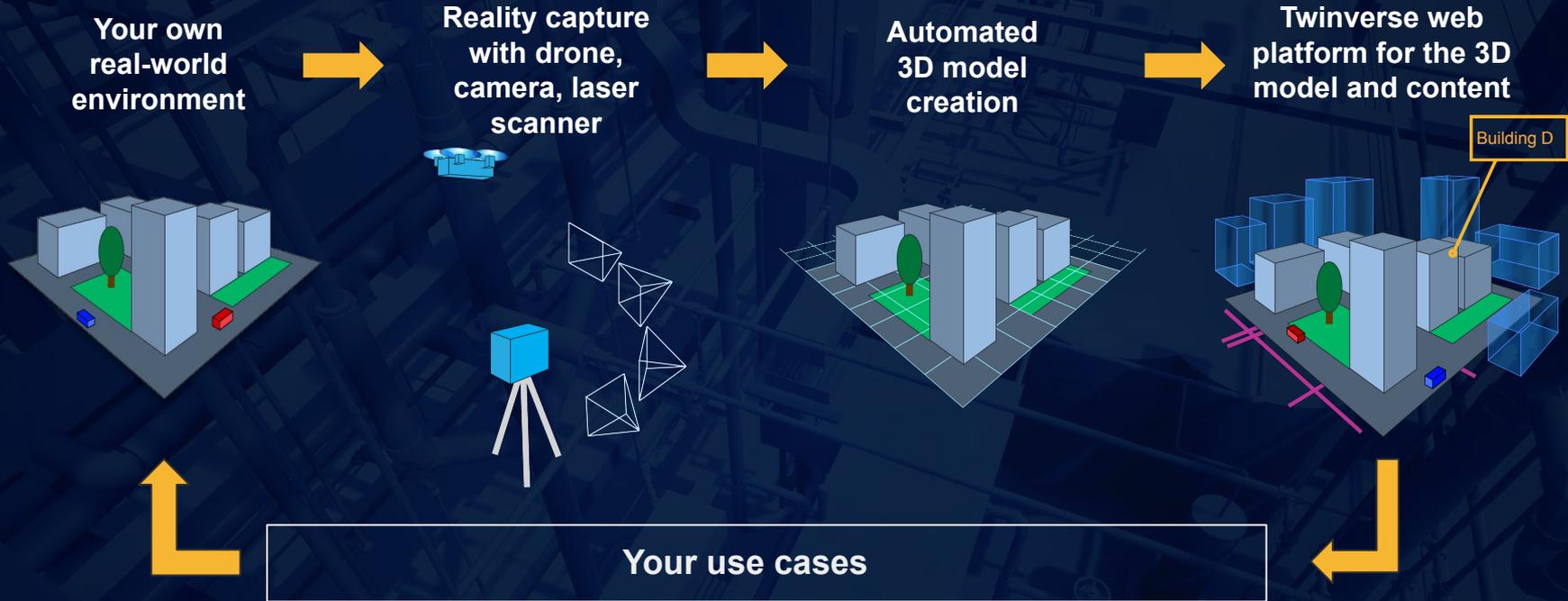
- + Easy to produce
- + Good in giving an overview with simple 2D content
- + Animations in 2D

3D reality model



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

Industrial metaverse implementation with Twinverse



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



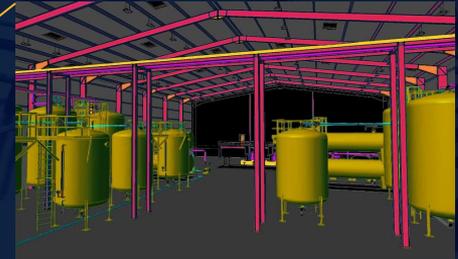
+ Rapid situational awareness from 360° images

Case specific content

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

Supplementary data

CAD models, designs and drawings



Maps, layouts, plans and other spatial data

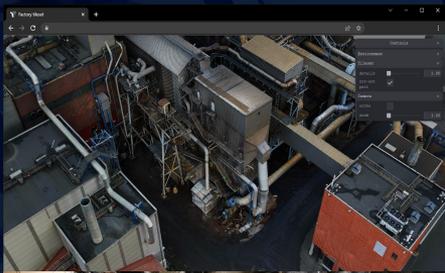


+ Other documents, pictures, videos and data streams

**Twinverse
collaborative
web platform**

**Change planning
Asset management
Training**

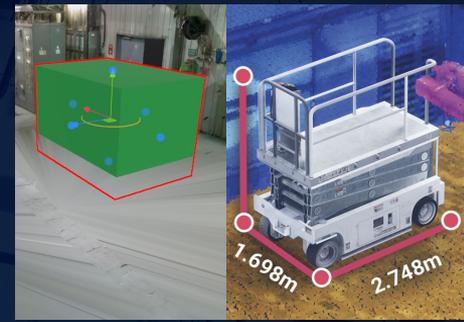
USE CASES



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