



Technology Data Capture and Model Building

Using drones to create digital twins for visual assessments and project visualization.

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Understanding Digital Twins

Digital twins are digital recreations of physical objects or systems, designed to mirror their real-world counterparts by integrating diverse datasets.

They act as a constantly evolving connection between the physical and digital worlds, with the ability to be updated in real time.



Constructing Digital Twins

Data Collection

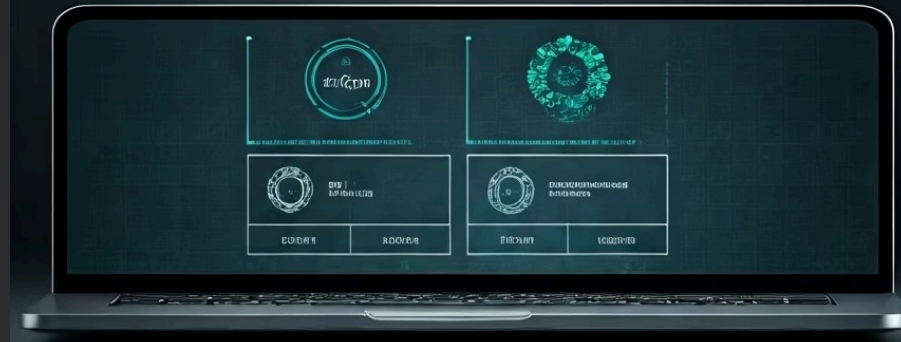
Capturing hundreds or thousands of high-resolution images and sensor data

Data Processing

Converting raw data into point clouds, 3D meshes, and other formats

Integration

Combining multiple data layers for comprehensive asset understanding



Key Components of Digital Twins



Point Clouds

Thousands or millions of spatial data points forming a 3D representation with precise geolocation for accurate measurements.



3D Meshes

Evolved from point clouds by adding surfaces between points, typically forming triangular patterns to create cohesive representations.



2D Orthomosaics

High-resolution, georeferenced 2D maps generated from aerial imagery with significantly finer detail than satellite maps.



Benefits of Digital Twin Technology



Remote Assessment

Comprehensive view and analysis without physical proximity



Enhanced Collaboration

Asset information accessible to remote stakeholders



Improved Safety

Reduced exposure to dangerous environments



Applications in Construction



Planning

Architects use digital models to demonstrate how structures will fit within a space



Pre-Assessment

Contractors identify areas requiring detailed attention before on-site work begins



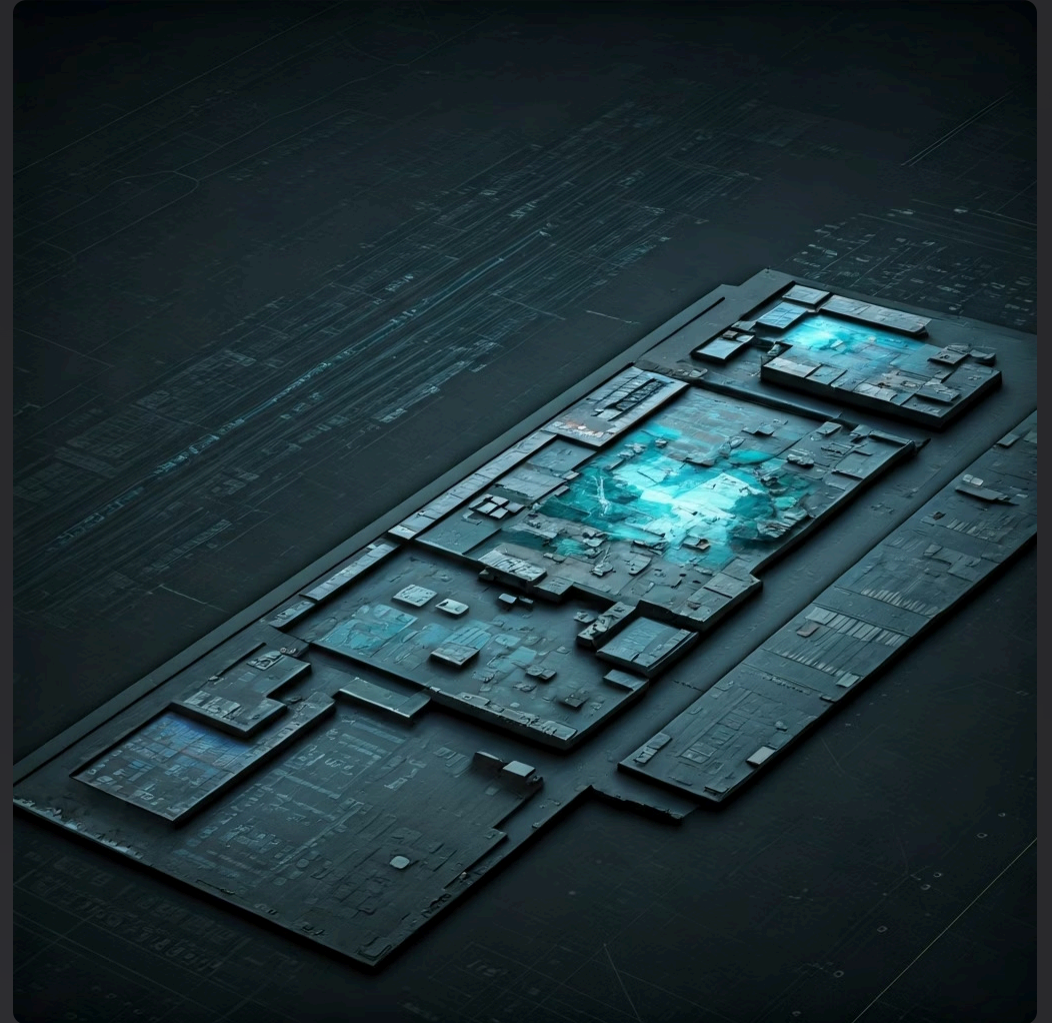
Documentation

Visual record of asset condition serves as reference for historical accuracy

Digital Terrain Models

Digital Terrain Models (DTMs) represent the ground's surface, excluding features like vegetation or man-made structures.

By mapping elevation changes, DTMs ensure that the virtual model reflects the physical terrain accurately, providing critical data for infrastructure planning and design.





Transforming Industry Workflows

The integration of drones with digital twin technology is reshaping how industries approach asset management and visualization.

By offering comprehensive, dynamic models of physical systems, digital twins enhance decision-making, reduce risks, and improve collaboration across construction organizations.