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Business Domain

Telecommunications, GIS

Project Type

GIS Data Management,
Automated Feature Extraction,
Web-Based Infrastructure
Monitoring

Optimized Tower Space Management: GIS Solution Enables Efficient Equipment Inventory for European Telecom Provider

Client

A leading European telecom infrastructure provider specializing in the construction and leasing of telecom towers. Their portfolio includes large-scale towers in rural areas and smaller rooftop structures in urban settings.

Project

Developing a GIS-based system to survey telecom towers, inventory equipment, and streamline real-time data collection. Handheld LiDAR scanners captured point clouds for precise equipment measurements, which were automatically processed into 3D vector models and stored in a centralized database.

Objective

The Client aimed to create a precise, continuously updated inventory of available and occupied tower space while optimizing data collection and visualization. This would improve leasing decisions, enhance maintenance planning, and ensure structural safety.

Team Reinforcement

The project was executed by a team of 4 specialists, including 1 GIS analyst, 1 remote sensing expert, 1 LiDAR specialist, and 1 project manager.

Challenge

Inconsistent equipment reporting made it difficult for the client to track available tower space. Without automated measurements, manual site visits were required, slowing down infrastructure planning.

The Client lacked the expertise in GIS-based inventory solutions and advanced data processing techniques. They also needed a scalable and automated system to handle large amounts of spatial data efficiently.

Quick Facts

- ✓ Over 5,000 towers surveyed across the country
- ✓ Processed over 10 terabytes of spatial data to create 3D layers of equipment
- ✓ 6 months, covering data collection, processing, and system development
- ✓ Enabled real-time collaboration through a centralized GIS database

Technologies

Handheld LiDAR / Python / PostgreSQL/PostGIS / GIS Web Viewer / Automated Processing Scripts

Solution

★ 01

Introduced handheld LiDAR scanners for engineers performing tower maintenance, allowing them to capture 360° spatial data effortlessly.

★ 02

Established a workflow where collected data was uploaded to a centralized server, cleaned, and processed to generate structured 3D vector representations of equipment.

★ 03

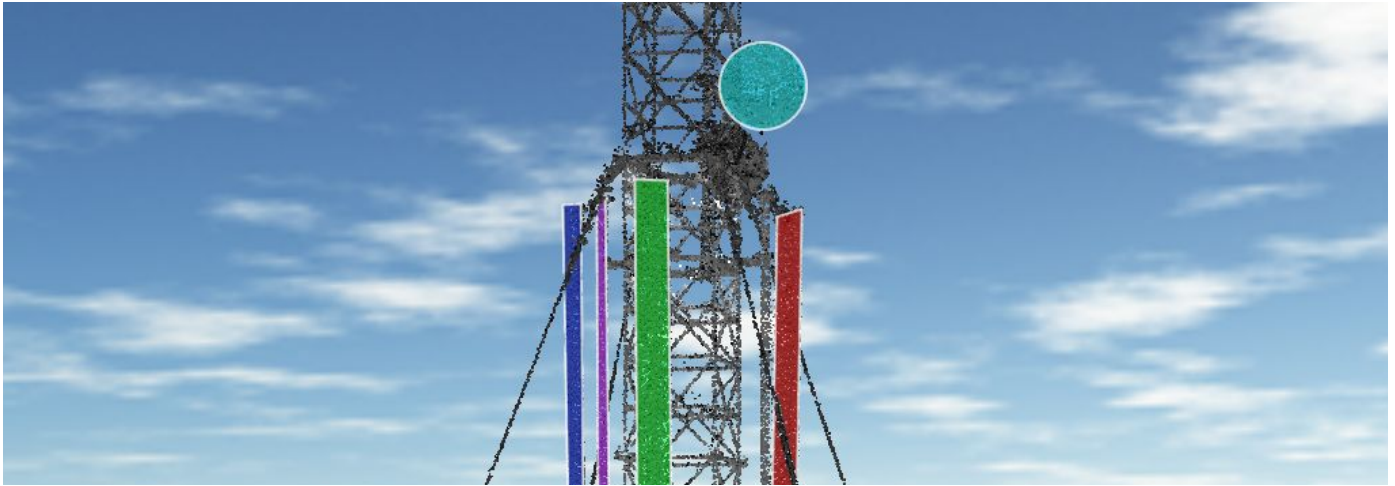
Eliminated manual measurements by developing automated scripts to calculate dimensions and positions within a cloud-based database.

★ 04

Created an intuitive web viewer displaying point clouds, vectorized equipment, and key attributes, optimized for easy access and analysis.

★ 05

Provided functionality for attribute modification, error flagging, and integration with the Client's existing asset management systems.



Client Reference



This GIS solution transformed our approach to tower space management. The automated inventory process saved time, improved accuracy, and gave us real-time visibility into our infrastructure.

Benefits and Results

- ★ **Optimized Inventory Management:** Automated vectorization and database integration eliminated 80% of manual measurements.
- ★ **Increased Accuracy:** Eliminated human error in equipment measurements, achieving near-perfect accuracy in spatial data.
- ★ **Operational Optimization:** Handheld LiDAR scanners reduced data collection time by 50%.
- ★ **Scalable & Future-Ready:** Web viewer improved infrastructure monitoring efficiency by 60%.

Techstack:

Handheld LiDAR, Python,
PostgreSQL/PostGIS, GIS Web Viewer,
Automated Processing Scripts.

Team: 4

GIS Analyst,
LiDAR Specialist,
Web Developer,
Project Manager