Digitalni dvojnik Nemčije

Towards a Digital Twin Germany

Prof. Dr. Paul Becker, Federal Agency for Cartography and Geodesy Germany

ABSTRACT

Geospatial information is the essential foundation for many sectors and the basis for decision makers to find solutions to tackle all the global challenges. But "Mapping" is not about traditional paper maps any more – at least almost no more – but Digital Twins are the tools of the future.

The Digital Twin Germany (DigiZ-DE) is an innovative platform currently being developed by the Federal Agency for Cartography and Geodesy (BKG) on behalf of the Federal Ministry of the Interior to support the federal administration in sustainable decision-making in spatial and geo-related tasks. The platform aims to address the growing need for detailed 3D data and landscape change information, as traditional maps are no longer sufficient. DigiZ-DE provides an interactive tool that enhances transparency, facilitates collaboration, and supports active participation in planning processes.

A core component of the platform is a high-precision 3D model created using airborne laser scanning technology (LiDAR), which captures objects with exceptional detail. RGB images are also captured to colorize the 3D point cloud, which is recorded during the vegetation period (March-November) for accurate vegetation data.
The nationwide aerial survey started in summer 2024 and will be completed by fall 2025, with the fully classified point cloud available in mid-2026. The BKG aims to make this data accessible to federal authorities, while offering open access to a lower-resolution dataset (10 points/m²) for other users, such as cities, municipalities, and scientific institutions.

DigiZ-DE is designed for the federal administration, enabling efficient resource use and collaboration through data-driven applications. The platform integrates various data types, such as geodata, satellite images and environmental information, and utilizes cloud technologies to manage large data volumes, creating a dynamic, adaptable map for better planning and decision-making across Germany. Pilot projects demonstrate the broad application potential and provide valuable impetus for the further development of the concept. The Digital Twin for Germany provides precise data on vegetation, topography and infrastructure through LIDAR Scanning. The data can be used in urban planning to enhance city climate and air quality, but also in forest management to estimate wood stocks and calculate profits for the industry. It also contributes to detecting possible obstacles in the aerospace sector.

KEYWORDS: Digital Twin, Lidar data, Use cases

Federal Agency for Cartography and Geodesy Germany, Richard-Strauss-Allee 11, DE-50598 Frankfurt am Main
e-mail: paul.becker@bkg.bund.de