

# DIGITAL TWIN-BASED FULL-LIFECYCLE MANAGEMENT PLATFORM AND METHOD FOR BUILDING OPERATION AND MAINTENANCE

## ABSTRACT

5

The application discloses a digital twin-based full-lifecycle management platform and method for building operation and maintenance, including: a data acquisition layer, a digital twin model construction layer, an intelligent operation and maintenance management layer, and a visual interaction layer. The application integrates BIM design data, construction process, real-time sensing data, and historical operation and maintenance logs to eliminate information islands at various stages of a traditional building, achieve full-chain data traceability from design to demolition, and provide complete data support for renovation and equipment replacement; uses multi-scale modeling and edge computing real-time synchronization technology to solve the problem of static BIM model being disconnected with physical entities, so that virtual models may respond to building structure deformation and equipment state changes in milliseconds, improving state monitoring accuracy and saving manpower and material resources; and monitors structural health degree in real time, to detect equipment abnormality early and avoid safety accidents.

20 FIG. 1