co·labs

Creating A Digital Twin For Physical Space Optimization

Case Studies

Digital Twin Platform

Client Overview

A rapidly expanding company with a large portfolio of physical spaces across multiple countries.

Problem Statement

The client needed to monitor and optimize their built environments at scale. They struggled with deploying and managing diverse IoT devices, lacked spatial context for sensor data, and had difficulty integrating various building management systems.

Objectives

- Monitor physical spaces and interactions between people and the environment
- Improve workplace efficiency and employee engagement
- Optimize space utilization and reduce operational costs
- Enhance environmental conditions in built spaces

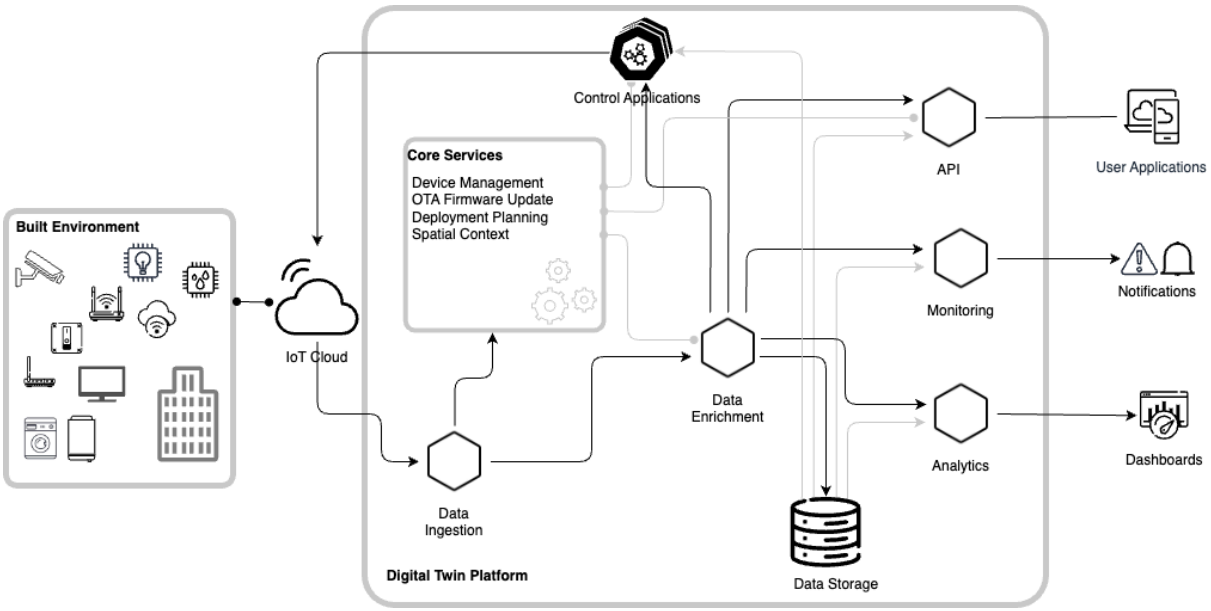
Solution

We developed a comprehensive IoT platform that enabled deployment, management, and integration of connected devices within the built environment. The solution included runtime applications for data processing, APIs for insights, and tools for deployment and device management.

Highlights

- Scalable device deployment and management system
- BLE OTA firmware update mechanism
- Spatial context integration for data enrichment
- Unified platform for diverse IoT devices and building systems
- Real-time processing of sensor data with edge/cloud capabilities

Diagram: WIP



Implementation Highlights

- Developed a custom firmware SDK for BLE OTA updates
- Created tools for deployment planning, installation, and verification
- Built services for device identity management and testing
- Implemented a device ontology for scalable metadata storage
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Results and Impact

- Enabled deployment and management of sensors across 40 US states, 5 EU countries, and Japan
- Improved space utilization through real-time occupancy monitoring
- Reduced energy costs via optimized environmental control
- Enhanced employee experience with data-driven space design
- Streamlined deployment processes, reducing time and errors

Innovation Spotlight

The project showcased novel approaches to large-scale IoT device management and spatial data integration, applicable across various industries requiring extensive IoT deployments.

Conclusion

This solution empowered the client to make data-driven decisions about their physical spaces, significantly improving efficiency, reducing costs, and enhancing user experience across their global portfolio.