

TECH OFFER

AI-Powered Digital Twin Centralised Management Platform for Cross-Industry Operations



KEY INFORMATION

TECHNOLOGY CATEGORY:

Green Building - Sensor, Network, Building Control & Optimisation
Infocomm - Smart Cities
Infocomm - Artificial Intelligence

TECHNOLOGY READINESS LEVEL (TRL): **TRL9**

COUNTRY: **HONG KONG**

ID NUMBER: **TO175438**

OVERVIEW

When companies engage in large-scale physical operations, various work processes and system are required to scale up to ensure the smooth operation while maintaining its expected performance. However, due to various systems (e.g., CCTV, IoT sensors, BIM models, manual checklists) being in respective disconnected data silos, this leads to reactive decision-making, operational inefficiencies, and compliance gaps, which is definitely less than ideal.

The technology solution addresses this critical pain point by providing an AI digital platform unifying fragmented data into a single, actionable source of operational intelligence, eliminating reliance on error-prone paper-based processes and disjointed tools. This platform leverages on a digital twin infrastructure to consolidate all data silos into a single point of truth for various business unit's operation, maintaining operational efficiencies and compliance. By leveraging on their Generative AI (Gen-AI) module to generate predictive insights, it enables proactive management (e.g., pre-empting safety hazards, forecasting

maintenance needs) instead of post-incident responses, directly addressing the market need for cost-effective, scalable operational excellence.

The technology owner is currently seeking industrial collaborators with complex physical assets (e.g. construction, manufacturing, FM, smart cities and healthcare) looking to streamline operational workflow, enhance safety and optimise resource utilisation.

TECHNOLOGY FEATURES & SPECIFICATIONS

The comprehensive solution, in a digital platform formfactor, comprises of six core interconnected modules that provides its capabilities and functionalities. They are:

- **Digital Twin Foundation:** A live 3D + time replica of physical assets (e.g., buildings, factories, city blocks) that integrates GIS and BIM models (up to LOD 500) as the visual/data backbone of the operation.
- **3-Tier AI CCTV Hub:** Infrastructure-free retrofit of existing cameras into platform (Tier 1) while leveraging on 100+ pre-built AI models for safety/ hazard detection (Tier 2) and GenAI capabilities for contextual progress tracking and automated compliance (Tier 3).
- **Tamper-Proof Photo Analytics:** GPS/time-stamped imagery from various sources, such as drones and bodycams, with GenAI auto-tagging, defect detection, and spatial mapping to the Digital Twin.
- **Digital Workflow & Supervision System (DWSS):** Generation of digital checklists, real-time issue ticketing, live KPI dashboards, and automated audit trails.
- **One-Click Smart Reporting:** Auto-generates compliance, handover, and analysis reports for visibility and follow-up action.
- **On-Demand App Marketplace:** Tailored tools for asset management, ESG monitoring, etc. which also serves as a platform for co-development of customised industry-specific tools.

The technology solution has been validated in real-world use-cases and have been noted to result in reducing construction non-conformance rates by up to 28% and FM maintenance costs by up to 22%.

POTENTIAL APPLICATIONS

This technology is deployable across several key industries below, with potential applications such as:

- **Construction:** Real-time progress tracking against BIM schedules, automated QC (e.g., rebar/concrete checks), and safety hazard alerts.
- **Facility Management (FM):** Predictive maintenance for HVAC/equipment, energy (ESG) monitoring, and tenant request ticketing.
- **Smart Cities:** Unified oversight of traffic, public safety (crowd density, abandoned objects), and infrastructure (pothole/streetlight repairs).
- **Manufacturing:** Assembly line SOP compliance, visual defect detection, and material flow tracking.
- **Healthcare:** Patient fall monitoring, pharmacy access control, and sterilization checklist compliance.
- **Retail (e.g. Malls):** Footfall heatmaps, queue management, and common-area maintenance tracking.
- **Property/Real Estate:** Asset inventory management and space utilization optimization.

MARKET TRENDS & OPPORTUNITIES

The global market for this technology is substantial, driven by demand for smart infrastructure:

- **Smart Building Market:** Projected to reach \$109.48 billion by 2030 (Grand View Research), with 11.6% CAGR.
- **Smart City Market:** Expected to hit \$820.7 billion by 2030 (Allied Market Research), growing at 14.9% CAGR.
- **Industrial Digital Twin Market:** Forecasted to reach \$110.1 billion by 2029 (Fortune Business Insights).

UNIQUE VALUE PROPOSITION

This comprehensive solution provides a **single source of truth**, addressing the gap of current siloed tools, to ensure all stakeholders (e.g. engineers, FM, regulators, managers) within a company are able to work from consistent, synchronised data. Unlike current “state-of-the-art” solution which are often industry-specific, require expensive hardware upgrades, or offer reactive monitoring, this platform delivers three unmatched benefits:

1. **Industry-Agnostic Flexibility:** Works across construction, healthcare, smart cities, etc., without reconfiguration, thanks to its open integration with any BIM/GIS/IoT system.
2. **No Hardware Overhead:** Retrofits existing cameras/sensors, eliminating the need for costly new equipment or proprietary hardware.
3. **Proactive Intelligence:** Moves beyond “alert-only” systems to GenAI-driven prediction (e.g., forecasting equipment failure, identifying high-risk safety zones) and automated action (e.g., auto-assigning maintenance tickets), reducing incident response time by 50%+ in real-world use.