



case study

Smart Facility & Building Management System for a Sports Complex in Singapore



From Reactive Facility to Intelligent Operations Platform

The Sports Complex is a multi-storey public sports facility designed to serve a growing regional population with high-performance sporting, recreational, and community spaces.

As operational complexity increased across mechanical, electrical, safety, and public-facing systems, the sports complex required more than a traditional Facility Management platform – it needed a unified, intelligent operations backbone.

iviva delivered a **Smart Facility & Building Management System, integrating 21,000+ live data points into a centralised process-driven and 3D digital twin platform.**

The result: predictive maintenance capabilities, integrated incident response, and a unified operations model across asset lifecycle, safety, and service delivery – enhancing both operational efficiency and the user experience for visitors.

The sports complex now operates with real-time operational visibility, automated fault detection, and governance-grade reporting, positioning it as a future-ready, digitally enabled public sports facility.



21,000+

Live Data Points
Integrated



6

Storeys Facility
Digitally Unified
through a
Digital Twin



Predictive

AI/ML-driven
Maintenance



7

Major MEP Systems
Commissioned &
Digitised

Operational Complexity Without Orchestration

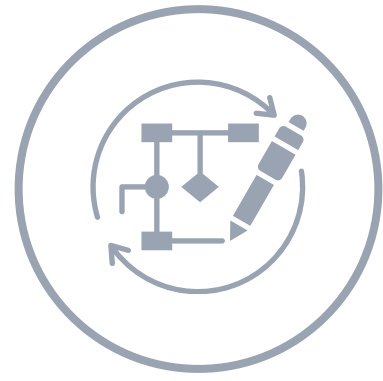
The sports complex faced a business-level operational challenge common to complex public infrastructure:



Disconnected Building Subsystems
(BMS, fire, ACMV, CCTV, access, utilities)



Manual Maintenance Workflows
with reactive fault management



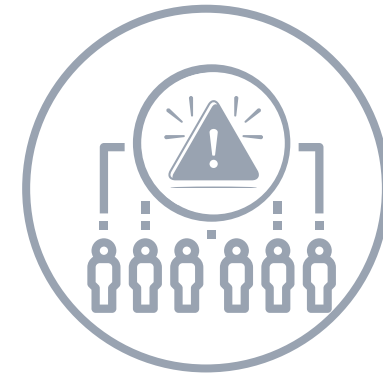
Fragmented Processes
for contractors and permits



Limited Operational Visibility
across critical sporting zones



Increasing Governance Requirements
for ESG and Green Mark compliance



Public Safety Risks
in high-density and high-hazard areas such as pools

The issue was not system availability – it was orchestration. Without a unified operational layer, the sports complex risked:



Higher lifecycle asset costs



Inefficient preventive maintenance regimes



Slower incident response



Increased downtime and reactive intervention



Limited auditability and compliance tracking



Energy inefficiencies due to undetected performance drift

Conventional approaches lacked predictive intelligence, lifecycle continuity from commissioning to disposal, and spatial context linking assets to operational workflows.

A Unified Process and 3D Digital Twin Platform

The sports complex required a single, centralised operations platform capable of integrating systems, embedding intelligence, and enabling both process and 3D digital twins for operational decision-making.

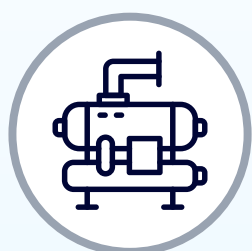
iviva implemented a Smart Facility and Building Management System designed as a unified operational command layer for the entire sports complex.

1. Integrated Asset Lifecycle Management

A complete digital asset twin was established from commissioning through operations, refurbishment, and disposal.

Commissioning to Operate (C2O)

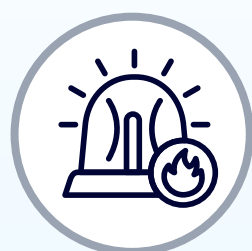
All major MEP systems were commissioned and digitally verified within the platform, including:



Chiller
Systems



ACMV



Fire
Systems



Plumbing
& Sanitary



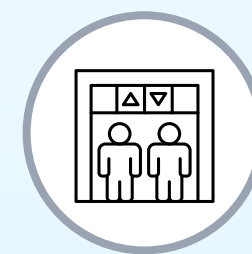
Electrical



CCTV



Access
Control

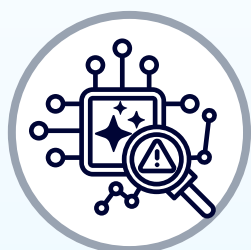


Vertical
Transport

Real-time functional verification ensured operational compliance from day one.

Predictive and Continuous Operations

Post-commissioning, assets transitioned into live operational monitoring:



Machine
learning-
based fault
detection



Rule-
based
anomaly
detection



Predictive
maintenance
models (initially
for Chiller &
ACMV systems)



KPI
performance
tracking

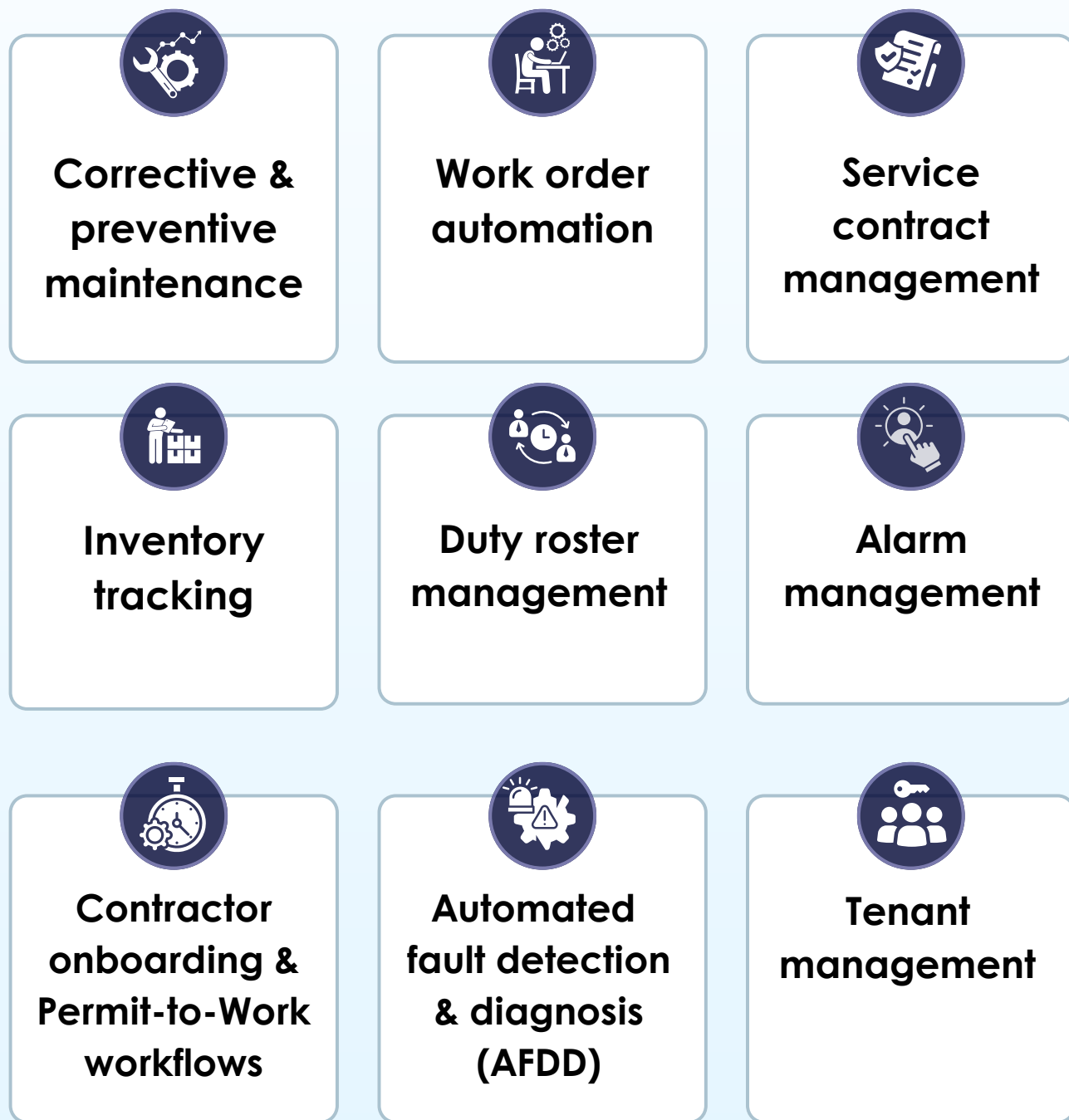


Equipment
availability
and
resilience
monitoring

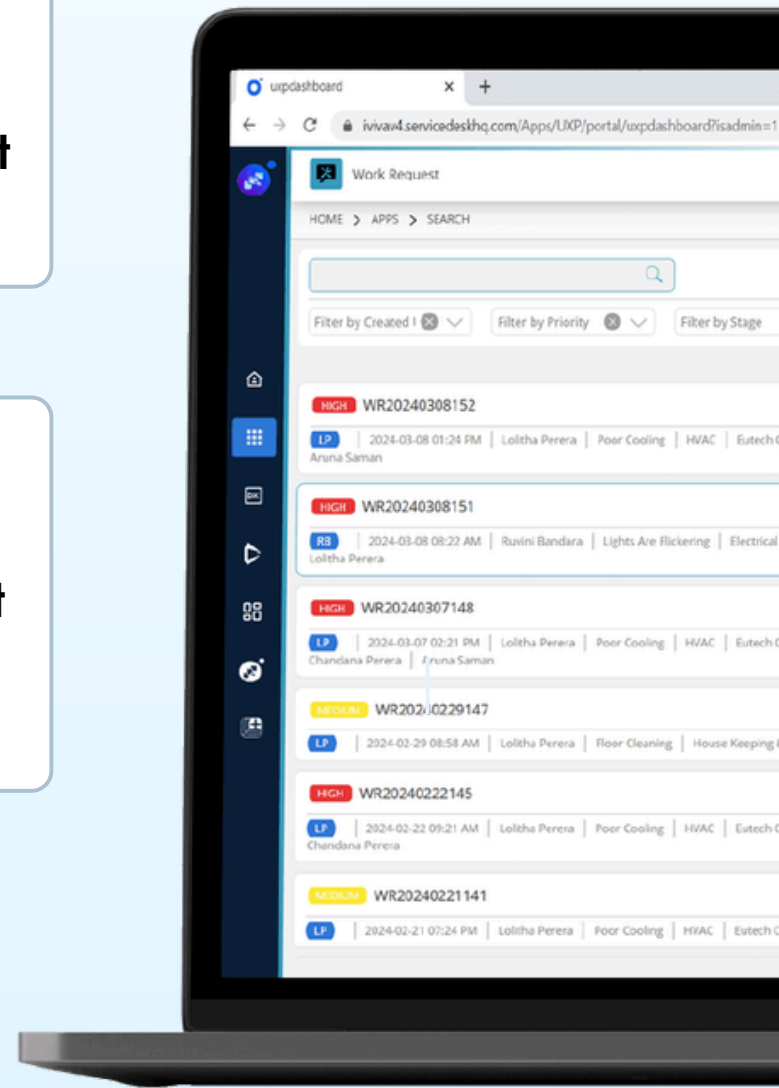
This shifted the sports complex from calendar-based maintenance to condition-based and predictive strategies, reducing unnecessary maintenance while minimising breakdown risk.

2. Unified Operations and Maintenance Suite

The platform centralised:

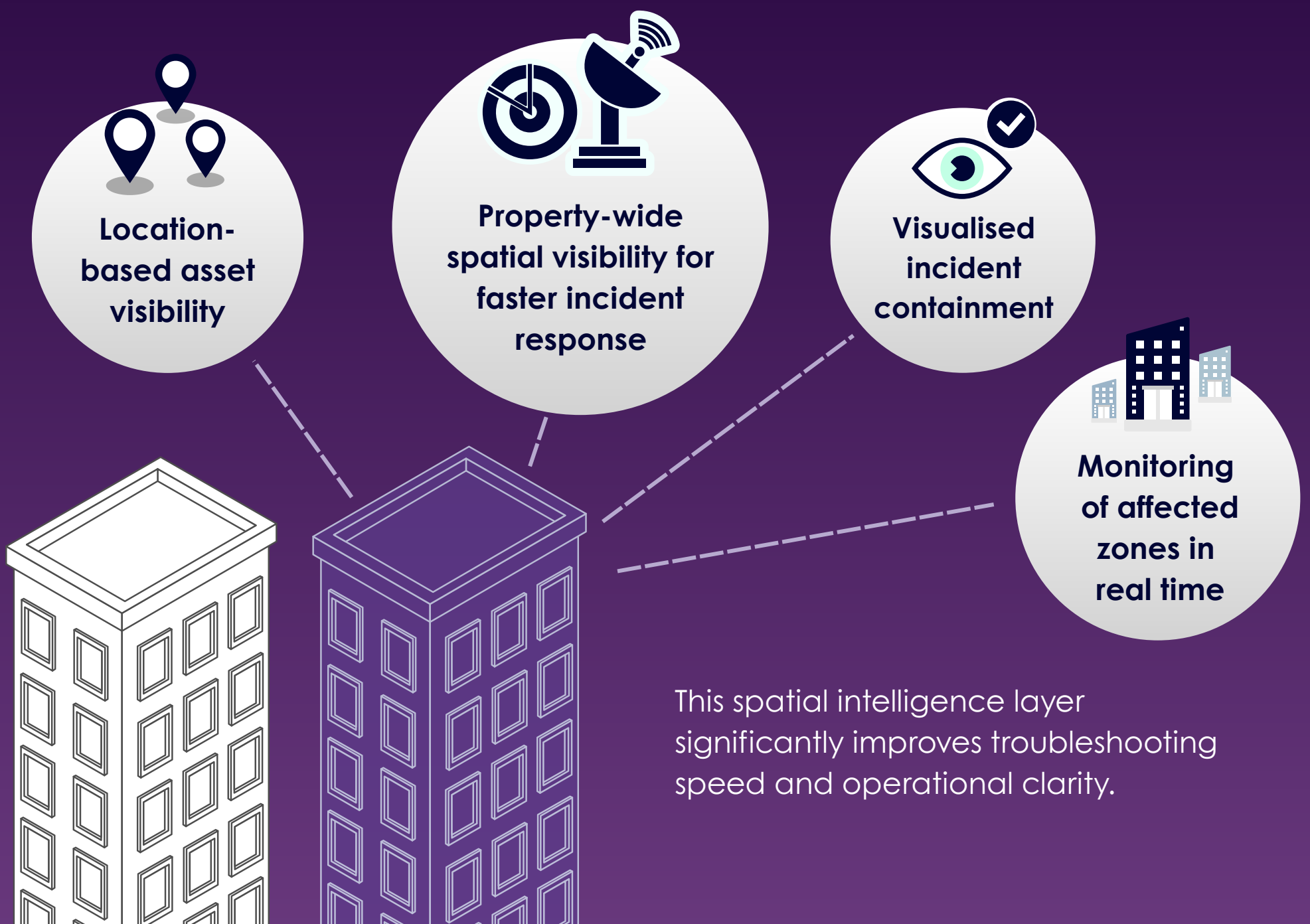


Work management, compliance documentation, SLA monitoring, and audit trails now operate within a single governance framework.



3. 3D Digital Twin and Smart BIM Integration

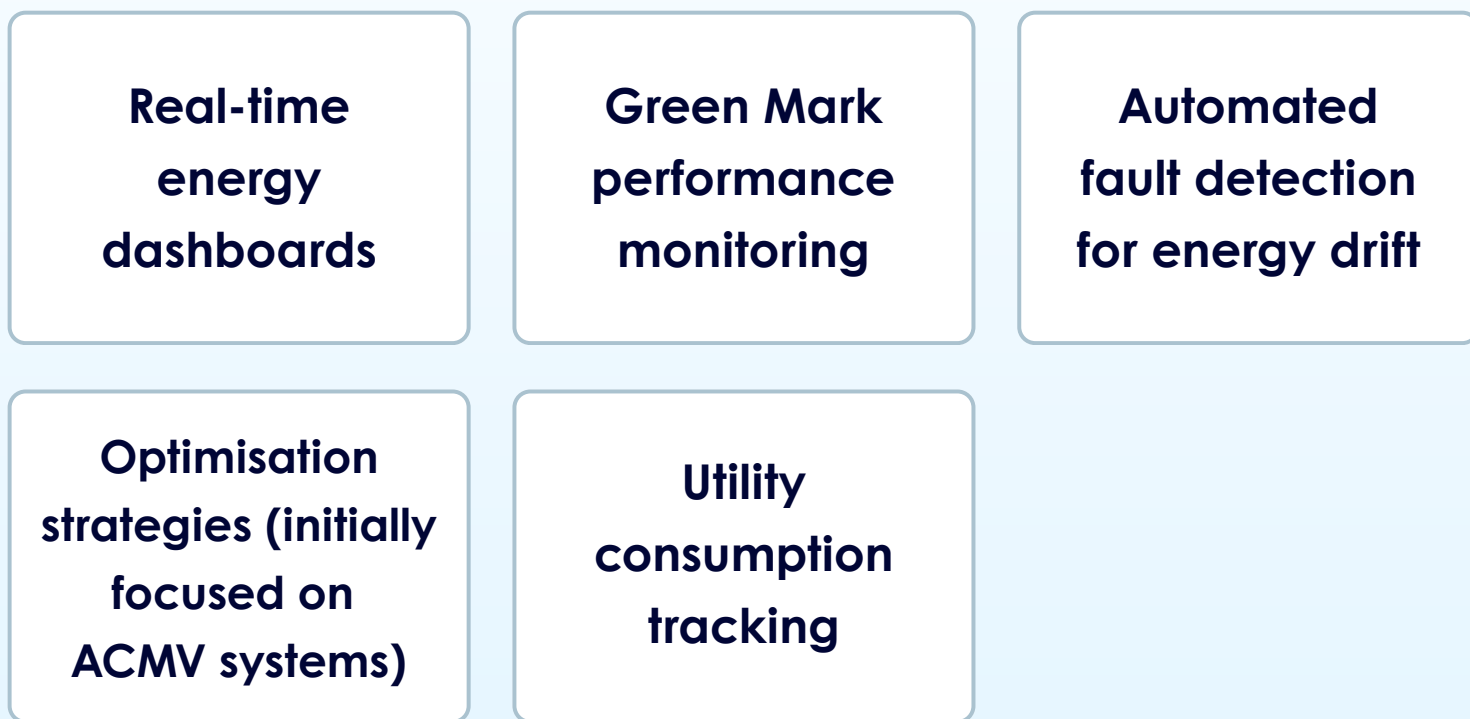
iviva linked live system data to a Smart BIM environment, enabling:



This spatial intelligence layer significantly improves troubleshooting speed and operational clarity.

4. Energy and Sustainability Governance

The sports complex required operational alignment with sustainability and safety mandates. iviva delivered:



By identifying performance inefficiencies early, the system reduces unnecessary energy consumption and supports compliance reporting.



THE SOLUTION

5. Advanced Incident Management

Given the public nature of the facility, safety was critical.

The Incident Management module integrates:



Swimming Pool Monitoring System integrates:



This creates a risk-aware operational environment, particularly in high-hazard sporting zones.

MEASURABLE IMPACT

While baseline metrics vary across operational phases, measurable outcomes include:



Reduction in unnecessary reactive maintenance activities through predictive approach.



Improved response time through automated fault detection



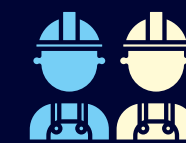
Enhanced incident response time through centralised dashboards



Improved equipment uptime and system availability



Energy optimisation through early anomaly detection

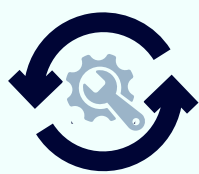


Full auditability of contractor, maintenance, and incident workflows

Operationally, the sports complex now benefits from:



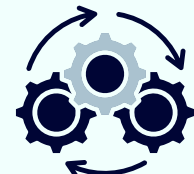
**Real-time
building
condition
monitoring**



**Improved
asset
lifecycle**



**Governance-
ready
sustainability
reporting**



**Faster
containment
of operational
incidents**

The sports complex now has a single operational source of truth, unifying people, processes, assets, and systems under one intelligent platform.

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