

Operational Intelligence Control Tower

Reference Architecture

This brief outlines a reusable reference pattern for discovery, architecture, implementation, and operational rollout.

Problem

Operations teams often make daily decisions from fragmented ERP, MES, IoT, WMS, fleet, and spreadsheet signals.

A control tower consolidates operational health, exceptions, alerts, and decision support into one governed operating surface.

Typical Architecture

Source systems feed connector services, an operational data layer, event processing, rules, AI recommendations, and a role-based control tower interface.

The architecture separates source integration, modeled data, business logic, and presentation so each layer can evolve independently.

Components

Connectors, validation jobs, operational metrics, alert rules, dashboard views, AI copilot prompts, audit trail, and administrative configuration.

Security Considerations

Use least-privilege source credentials, network isolation, role-based access, audit logging, encrypted transport, and careful handling of operationally sensitive data.

Integration Pattern

Start with read-only connectors and staged data validation before automating any operational action back into enterprise systems.

Implementation Approach

Begin with one operating area, define decision KPIs, connect the minimum viable source systems, validate exceptions with users, then expand by site or lane.

Operational KPIs

Production attainment, downtime, quality yield, energy load, warehouse utilization, fleet on-time performance, exception age, and action closure rate.

Deployment Model

A modular web application deployed with secure server-side services, PostgreSQL, scheduled jobs, and private connectivity to approved enterprise systems.

BMDigitals Engagement Model

Discovery sprint, reference architecture, production pilot, integration hardening, operational rollout, and managed improvement cadence.

Reference architecture. Final implementation depends on the client's operational and technical environment.

