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Hitachi Solutions Europe

G-Cloud 15 Service Definition Document

Digital Twin Development & Simulation

Digital Twin Development & Simulation

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What the service is, what you get, and the benefits

Service Description

Design and build digital twins to model assets, processes and environments, using real-time data from sensors and systems. We deliver simulation for scenario testing, performance and capacity planning, and predictive maintenance. Includes data integration, visualisation, security controls, validation, and handover for live operation.



Service Features

- Discovery workshops to define twin scope and use cases.
- Data integration from sensors, systems and operational datasets.
- Asset, process and environment modelling for digital twins.
- Real-time telemetry ingestion and event processing pipelines.
- Simulation models for performance, capacity and failure scenarios.
- Visualisation dashboards and 3D views for stakeholders.
- Validation, calibration and accuracy testing against real data.
- Predictive maintenance and anomaly detection model implementation.
- Security, access controls and data governance for twins.
- Handover, training and operating model for ongoing use.



Service Benefits

- Improve decision making using tested scenarios before changes.
- Reduce downtime through predictive maintenance and early warnings.
- Optimise capacity and performance without disrupting live operations.
- Increase safety by simulating hazards and failure modes.
- Improve planning with real-time operational visibility.
- Reduce costs by targeting maintenance and resource use.
- Align stakeholders using shared models and clear evidence.
- Speed up investigations with traceable data and simulations.
- Support assurance with documented models, assumptions and results.
- Enable continuous improvement through monitored performance and feedback.



Digital Twin Development & Simulation

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Turn real operational data into a safe place to test decisions



What this service is for

Build a trusted digital model of assets, processes and environments

Teams often need to make changes to assets and operations without being able to test the impact first. This service creates a digital twin that brings together sensor and system data so you can understand what is happening now and explore what might happen next.

We design and build the twin and the supporting data integration, then add simulation to test scenarios for performance, capacity and failure modes. We include visualisation, security controls, validation against real data, and handover so the twin can be used in live operation.

Key outcomes: Scenario testing before change | Real-time operational visibility | Validated model outputs | Simulation results you can evidence | Live handover ready



Why this service is useful

Reduce uncertainty, disruption and debate around complex decisions

When data is spread across tools, teams lose time reconciling numbers, arguing about what is true, and reacting after something fails. A digital twin provides a shared view of assets and operations, plus the ability to simulate changes safely before you commit time, budget or operational risk.

It supports predictive maintenance and early warnings, improves capacity and performance planning without disrupting live services, and makes investigations faster by keeping data and simulations traceable. It also supports assurance through documented assumptions, controls and results (where required).

Common triggers: Planned operational change | Repeated incidents or downtime | Capacity or performance constraints | Safety-critical scenarios | High maintenance cost | Need a single shared view



Why this service is different

Build confidence through validation, controls and handover

We focus on making the twin usable in day-to-day decisions, not just building a model. That means joining up data integration, simulation, visualisation and security from the start, then proving accuracy through calibration and testing against real data.

Our delivery is iterative and decision-led. We keep scope tight, prioritise the scenarios that matter most, and produce evidence that supports governance and assurance (where required), including clear assumptions, acceptance criteria, and change control touchpoints.

Differentiators: Validation-led build | Security and access controls by design | Traceable scenarios and assumptions | Handover for live operation | Iterative delivery with clear decisions

What is a Digital Twin

Before we start, it helps to be clear what a digital twin is *not*. It is not a single technology product, an IT system, or one deployable “thing”.

A digital twin is a way of working with both existing and newly available data, combining it in new ways so an organisation can improve how it plans, operates, and makes decisions.

Working definition: *A digital twin is a virtual representation of the real world, including physical assets, processes, relationships, and behaviours.*

What is a digital twin?

Digital twins can be built at different maturity levels, from basic descriptive views through to predictive and beyond.

They can be targeted at a specific purpose or broadened over time, depending on what you need to achieve.

In this context, we focus on asset-centred twins, covering how assets are defined, delivered, managed, and operated.

How to think about it

A digital twin is a *logical data arrangement* that brings multiple data sources together, even if those sources live in different systems. It is not a “system” on its own. Instead, it combines structured data with business processes and ways of working.

Different “types of twin” use different data and enable different outcomes, but they typically draw from the same shared core data foundation.

Our Digital Twin use cases

Descriptive Twin

Digital representation of the built and/or natural environment

- Brings information together from multiple sources
- Creates relationships
- Is updated with new information
- Allows information to be searched for and found
- Allows environments and assets to be visualised

Informative Twin

Describes the state of a physical asset, providing insight

- Fuses static and real time asset data
- Integration with Enterprise Performance Management and Control arrangements
- Elevated visualisation capabilities
- Allows for improved asset centric decision making

Predictive Twin

Provides prospective assumptions when ‘proven equivalence’

- Simulation of behaviour (having proved accurate equivalence of the twin)
- Prediction of future states based on variable inputs
- Allows for optimisation of time, cost and carbon in delivery
- Allows for optimisation of operation (proactive maintenance etc.)

Comprehensive Twin

Suitable for a wider set of use cases if it is ‘complete enough’

- Sufficiently ‘complete’ representation that augmented reality can be employed
- Useful for safety critical / high risk use cases
- Adaptable / updates automatically
- Allows for elevated delivery, operation and optimisation of asset performance and business value

Autonomous Twin

Allowed to drive automatic action if business conditions allow

- Allows ‘autonomy of things’ (IoT Phase 2)
- Learns and acts independently on behalf of human actors
- Allows for “Twin to Twin” interaction within a set of rules
- Less human interaction / intervention / more repeatable (this has limits)

Typical digital twin technology stack

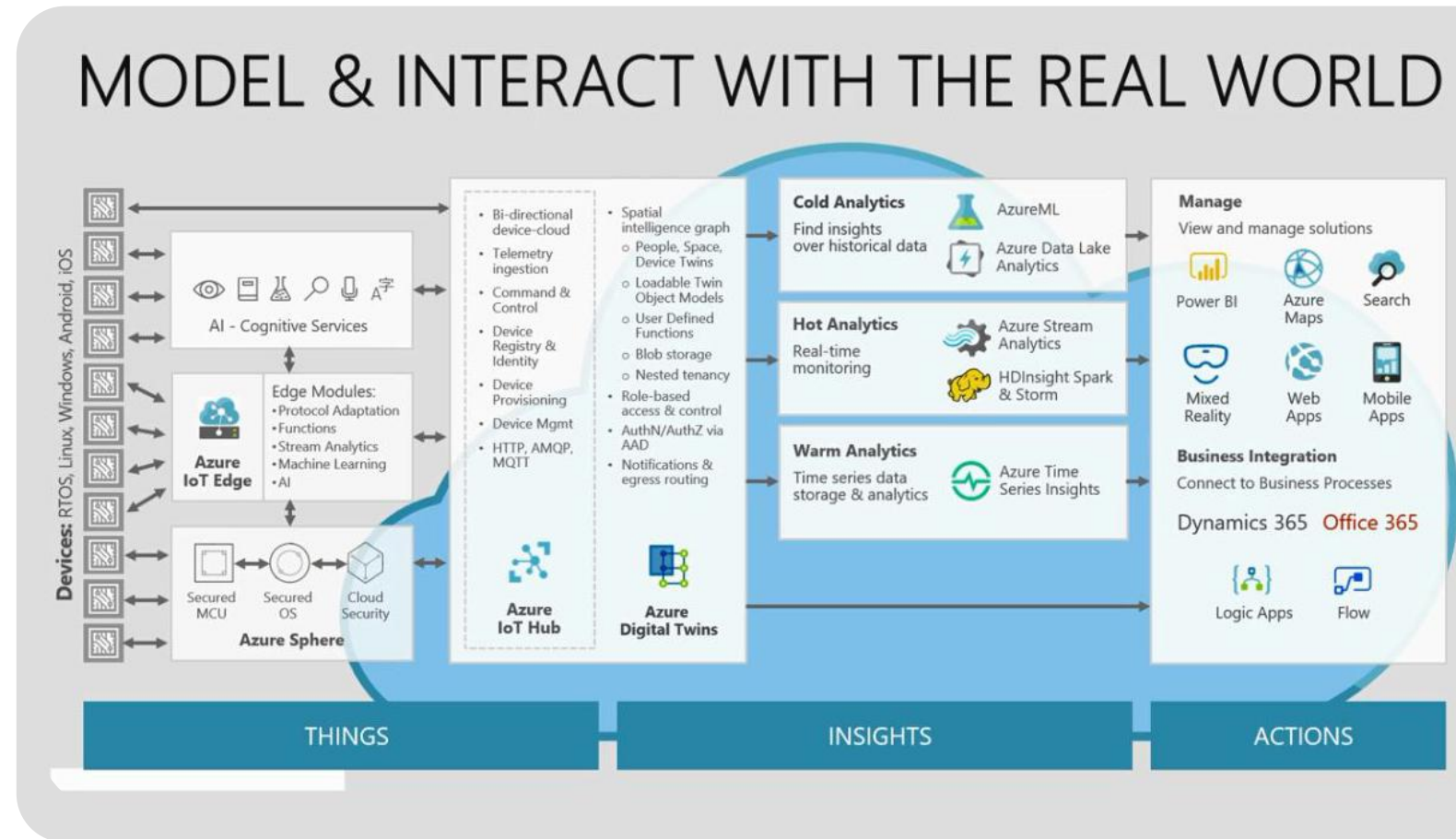
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How data moves from sensors to insights and operational action

We design digital twin architecture, so data is controlled, traceable and usable.

The twin model is governed and secured, telemetry is captured through managed pipelines, and analytics outputs are validated against real outcomes.

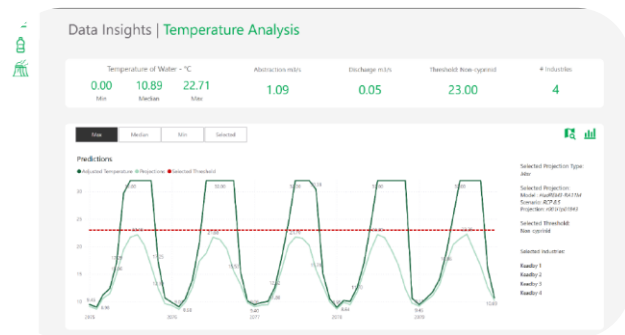
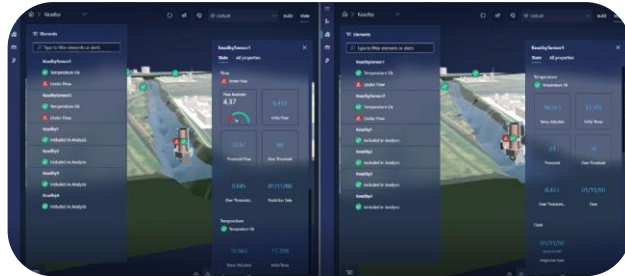
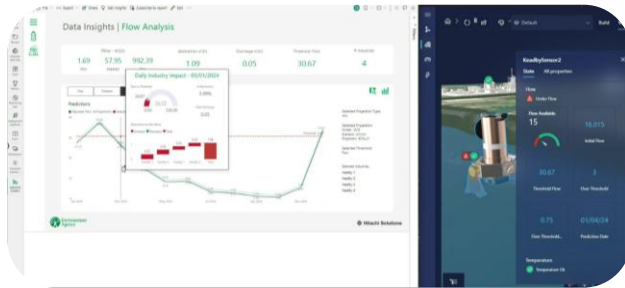
This creates a repeatable path from raw signals to decisions and actions, with clear evidence and audit trails.



Digital Twin services at a glance

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Modular support from use case to live operation



Use case scope and definition

Workshops to agree scenarios, measures, and what “good” looks like.



Data integration and telemetry pipelines

Connect sensors, systems and operational datasets with secure ingestion.



Twin modelling (assets, processes, environments)

Build the logical model and relationships that reflect reality.



Simulation and scenario testing

Run performance, capacity and failure scenarios to support decisions.



Visualisation and stakeholder views

Dashboards and 3D views that make the twin usable day to day.



Validation, security and handover

Calibration against real data, access controls, runbooks and training.

The Hitachi logo is displayed in a bold, white, sans-serif font in the upper right corner of the image. The background is a photograph of a grand, multi-story classical building with a curved facade, many windows, and a balcony with a black wrought-iron railing. A large Union Jack flag is flying from a pole on the right side of the building. The overall image has a muted, greyish tint.

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Hitachi Solutions Europe

UK Government Overview

Hitachi Solutions for the UK Government

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Our **vision** is to be government's partner of choice for the design and delivery of **sustainable, human-centred, Microsoft Solutions and digital services**.

Human-centred Services

Every service starts with people and how technology can make their day simpler.

+

Deep Microsoft Expertise

Hitachi Solutions is dedicated exclusively to the Microsoft ecosystem.

+

Emotionally Aware Delivery

Our former civil servants bring deep understanding and cultural alignment.

=

+

One Hitachi

Hitachi Solutions is part of Hitachi, Ltd., one of the world's largest and most respected organisations.

Sustainable government transformation.

Human-centric by default.

Powered by Microsoft.



Our Credentials

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Microsoft



Microsoft global Government and Finance
Partner of the Year 2025

Microsoft Partner of the Year 2025 Finalists in
Build and Modernise AI Apps, Dynamics 365
Supply Chain, Dynamics 365 Sales and Customer
Insights, and Low Code Application Development

22 Years in **Microsoft's Inner Circle**
(including 2025)

Microsoft Solutions Partner across AI Business
Solutions, Cloud and AI Platforms and Security
with **18+ specialisations**

Industry



Keystone member of the **Government Digital
Sustainability Alliance**

Crown Commercial Service Supplier

Cyber Essentials Plus Certified

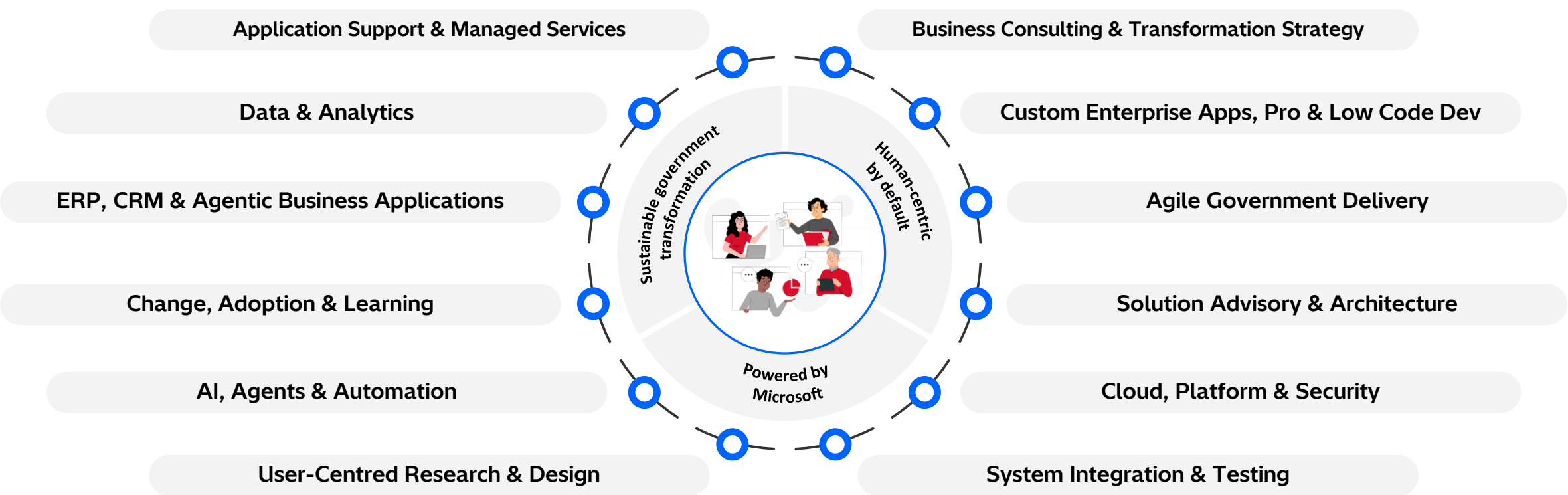
ISO-certified across Quality, Environment, Service,
Business Continuity, Information Security, and
Privacy Management

Recognised in the **Smarter Working Live Awards**
for our regulatory services Customer Experience
work with the Environment Agency

Our Services and Expertise

HITACHI

Sustainable business transformation through tailored advisory, consulting, and technology solutions.



Our Clients



"Hitachi Solutions brings substantial digital expertise to the table, complementing our robust business experience. Their insights have been instrumental in identifying opportunities for enhancement and accelerating our initiatives."

Gillian Pratt
Deputy Director Future Regulation
at Environment Agency



"Hitachi Solutions brought in a great project team who we kept for the full duration; they engaged with The Royal Mint side of things very effectively. It really felt like they were part of our own team."

Richard Hobbs
CIO The Royal Mint



"Hitachi Solutions bring the innovation, space and expertise needed to deliver digital transformation at a pace that is needed."

Andy MacDonald
Director of Customer Services,
Aberdeen City Council



"Hitachi Solutions were really good to work with, expertly turning our processes into slick system functionality. Their patience, understanding and "one team" approach to this project facilitated a free-flowing, inclusive environment. Hitachi Solutions' expert technical teams have delivered a great user experience, employing creative thinking to deliver to our often complex requirements."

Daniel Saward
OIA Head of Digital Technology



"DHSC collaborates closely with Hitachi Solutions LTS, emphasising the significance of our enduring partnership characterised by collaborative teamwork and mutual trust. Operating with a framework of high trust and capability, Hitachi Solutions ensures the delivery of quality and excellence to DHSC. Hitachi Solutions should be very proud of their track record in DHSC."

Bryan Rayner
Head of IT Business Systems



"Right from the start, we recognised in Hitachi Solutions a potential partner that would listen to us and really recognise the value of what we were trying to achieve, the lifesaving benefits of what we were trying to build and support."

Alex Duncan
Chief Technology Officer



Centre for Environment
Fisheries & Aquaculture
Science



Department
for Environment
Food & Rural Affairs



Valuation Office
Agency



HM Revenue
& Customs



Rural Payments
Agency



City of Westminster



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England



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KENSINGTON
AND CHELSEA



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Finance



Forestry and
Land Scotland
Coilltearachd agus
Fearann Alba

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