Digital Twins in the UK

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Introduction

1. Digital Twins in the UK
2. National Digital Twin Program
3. Digital Twins definition
4. UK Use Cases
Digital Twins in the UK

Advantages
• Remote monitoring and control of parts, processes and places
• Uses in a wide range of sectors
• Interconnected systems of digital twins

Recent developments
• Federated systems of interconnected digital twins
• Enabling technologies are developing

Challenges and Risks
• Data protection, ownership, ethical issues such as equality and bias
• Bringing down the cost of the current bespoke process
• A lack of a standardized framework for the development and networking of digital twins
• Data sharing and security

RTA: Digital twins - GOV.UK (www.gov.uk)
National Digital Twin Programme

Created by the UK Government in 2018 in response to the National Infrastructure Commission’s Report ‘Data for the Public Good’

- Gemini Principles
- Digital Twin Hub
- Information Management Framework
- Digital Maturity
- Developing legal agreements to govern security-minded information sharing
- Developing data visualisation tools
- Engage with government, industry and academia

National Digital Twin Programme - DT Hub Community (digitaltwinhub.co.uk)
Digital Twins Definition

1. A digital twin is a virtual representation of real-world entities and processes synchronized at a specified frequency and fidelity.
2. Digital twin systems transform business by accelerating holistic understanding, optimal decision-making and effective action.
3. Digital twins use real-time and historical data to represent the past and present and simulate predicted futures.
4. Digital twins are motivated by outcomes, tailored to use cases, powered by integration, built on data, guided by domain knowledge, and implemented in IT/OT systems.
UK Use Cases - NUAR

NUAR – National Underground Asset Register

What is it?
• Interactive, digital map of underground pipes and cables

Who Benefits?
• Asset owners
• Excavators
• Data Managers
• Planners
• General public and businesses

Economic Benefits
• Estimated economic benefits of NUAR are estimated at £350m per year

Timeline
• Project started in 2018
• Minimum viable product now online
• England and Northern Ireland full coverage expected in 2024/25

NUAR available to users in first UK locations - Geospatial Commission (blog.gov.uk)
Other UK Use Cases

National Digital Twin Programme
CReDO Climate Resilience Demonstrator
Impact of flooding on energy, water and telecoms networks
What is CReDo? - DT Hub Community (digitaltwinhub.co.uk)

UK Centre for Ecology and Hydrology
Land InSight: A Digital Twin for UK soils
A digital twin of UK soils to improve our understanding of soil moisture and soil carbon
Land InSight digital twin | UK Centre for Ecology & Hydrology (ceh.ac.uk)

UK Hydrographic Office UKHO
Autonomous ship navigation
Digital Twins to support maritime navigation case study | A DMINALTY