

G-Cloud 15

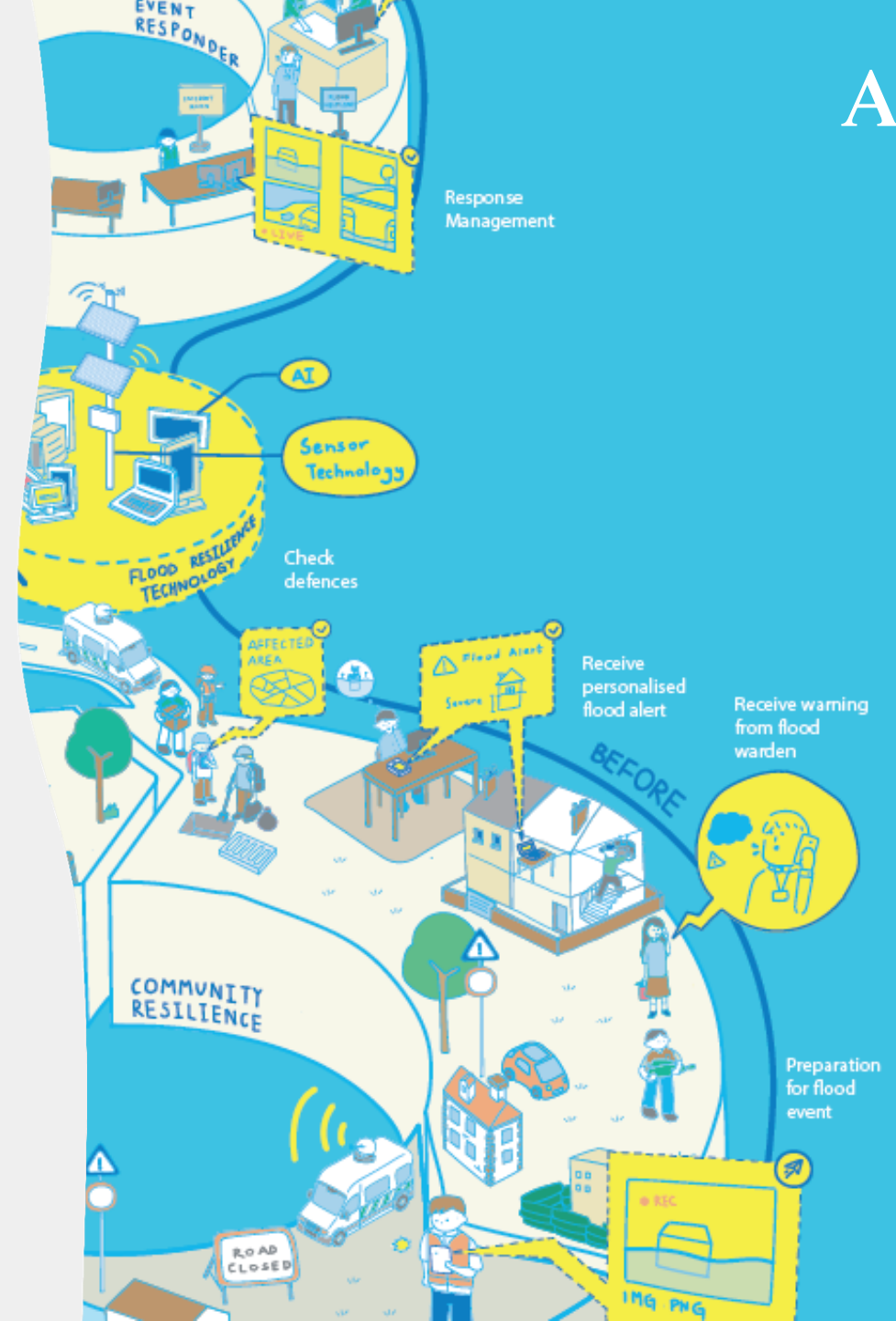
Digital twin

G-Cloud 15
Service definition document

Our firm

Arup is a global collective of designers, consultants and experts dedicated to sustainable development, and to using imagination, technology and rigour to shape a better world

ARUP



Our aims

The aims and principles laid out by Sir Ove Arup in his Key Speech, continue to underpin our firm today

-  Social usefulness
-  Total architecture
-  Humane organisation
-  Straight and honourable dealings
-  Quality of work
-  Reasonable prosperity

Who we are

We combine digital expertise with market knowledge to advise on the role of digital and data in the built and natural environment

We deliver services and solutions that solve complex challenges for our clients



Our strategy

We work with clients, partner
and practitioners who share
our commitment to create a
sustainable future for
everyone



Our partnerships

From climate change to city resilience, our long-term collaborations help us to tackle some of the world's toughest problems



Some of our clients



Our G-Cloud 15 services

Digital service design and development

Discovery phase

Alpha phase

Beta phase

Digital Asset Information Management

Digital Strategy and Architecture

Built Environment Data Advisory

Digital Transformation

Digital Energy

Digital Water

Digital Transport

Experience Design

Digital for Sustainability

Digital Twins

Digital Planning

Co-Design

GIS (Geographic Information System)

Digital Twin

Digital Twin

Introduction

Digital twins are often described as on-screen representations of physical assets: a building, a bridge, a transport system. But they're more than that.

Digital twins are combinations of data, visualisation and connected sensors, offering unparalleled insight into every facet of an asset's operation – from the occupancy level of an office building and the energy use of a hospital to the condition of an offshore wind turbine. They connect our physical and digital worlds.

As consultants and technologists who understand the built environment, Arup works with clients to develop a digital twin that generates valuable intelligence every day.

Those insights can inform decisions that enhance the physical asset, from improving its operation to making efficiencies and driving down costs, to shaping future design choices.



Features

Features

- Digital twin solutions for strategy and planning, assurance, and managing assets
- Development of client specific digital twin strategy and roadmap for digital twin development and implementation
- Advanced data analytics and simulation for achieving insight on client specific use cases and to do physical world interventions
- Use of data science, simulations and visualisation to provide actionable insights to do physical world interventions
- Digital advisory, consulting and transformation to guide organisations in harnessing digital tools effectively
- Digital tool development and deployment specifically focused on core needs and informed by deep domain knowledge
- Multidisciplinary expertise to tackle complex challenges combining analytics, automation, digital creativity, emerging technologies, and required deep domain expertise

Benefits

Benefits

- Actionable insights that maximise business potential
- Established expertise working on government digital and innovation programmes at national and regional levels
- Depth and breadth of digital twin expertise in all sectors and markets ranging from transport to energy through to cities
- Developing digital twins bespoke to client need, enabling clients to utilise business performance to support their plans and strategy to achieve efficient, reliable and resilience outcomes
- Maximise business potential by overcoming challenges and enhancing digital twin maturity level
- Agile practitioners used to working within large infrastructure organisations
- Experienced collaborators in complex and wide-ranging consortia
- Extensive experience in the Government Digital Service (GDS) process to enable efficient project management



Virtual Energy System, ESO

Enabling an ecosystem of interconnected energy digital twins

This project is the world's first digital replica of an energy system. Arup is helping define the common framework of a digital twin of Britain's entire energy landscape to connect systems, improve services and accelerate the path to net zero.



Information broker, LaGuardia

Delivering a smarter terminal

Arup's integration of the terminal's technology infrastructure has not only transformed the customers' journey through LaGuardia, it is also helping set new standards for airport energy usage, sustainability and operational efficiency.

The opportunity to rethink how the terminal operates is part of a complete phased redevelopment of LaGuardia. By allowing a dialogue between all the terminal's systems – running everything from flight information, jetbridges and baggage handling to bathrooms and air conditioning – Arup has led a data-driven revolution of the passenger experience. Its 'information broker', the central platform that is a touchstone for all the terminal's operating staff, could be a blueprint for future airport development.

[Delta's new terminal C at LGA](#)



A Digital Twin for the Digital Railway, Network Rail

Managing and operating the asset throughout its lifecycle

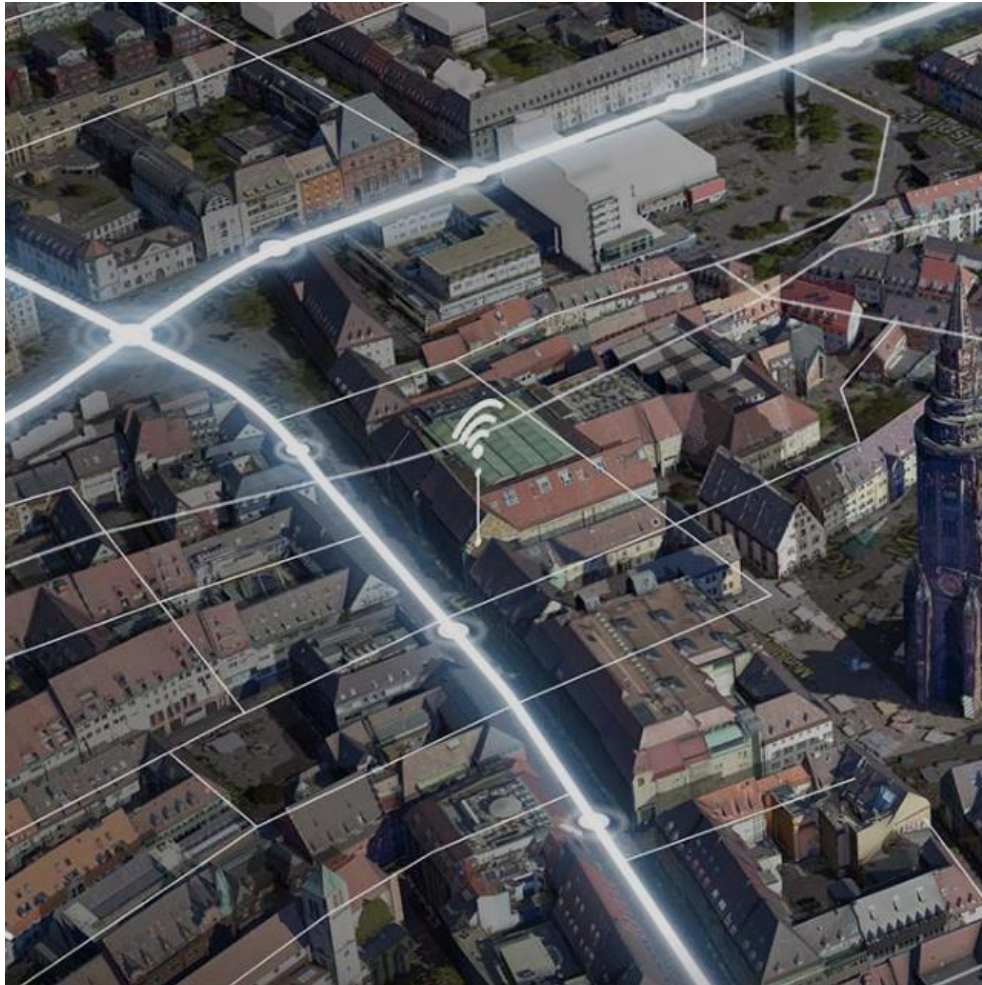
Feasibility study into how the concept of a Digital Twin can be applied to the benefit of a Railway running next-generation signalling. Our study looked at the benefits of a digital twin approach across the lifecycle of the asset, addressing both asset management and service operations management requirements from a shared Rail Network Model. We left with a practical roadmap for the incremental development of a digital twin that will deliver accumulating benefits across the UK rail system



The Hague City Hall, Province of Zuid-Holland

The road to net zero: government HQ digital twin helps turn complex questions into simple answers

By being able to test different future scenarios, our digital twin can help asset owners and operators to turn complex questions into simple answers. Compared to other contemporary state-of-the-art monitoring systems, a real digital twin can help generate and crunch huge amounts of data to predict the impact of system changes and optimise building occupancy.



DATEN:RAUM, City of Freiburg im Breisgau

Developing a digital city twin for mobility and urban properties

As part of its digitalisation strategy, the German city of Freiburg im Breisgau is developing a smart city model project. By collecting data from a multiple sources in a digital infrastructure, the project will analyse the data set and make it available to citizens and businesses, with the aim of improving the efficiency of city administration and urban development. We developed a digital city twin for this project with two prototypes: an application with local mobility data to create a people-friendly traffic space and a digital sales platform for urban properties



Adelaide City Plan, City of Adelaide

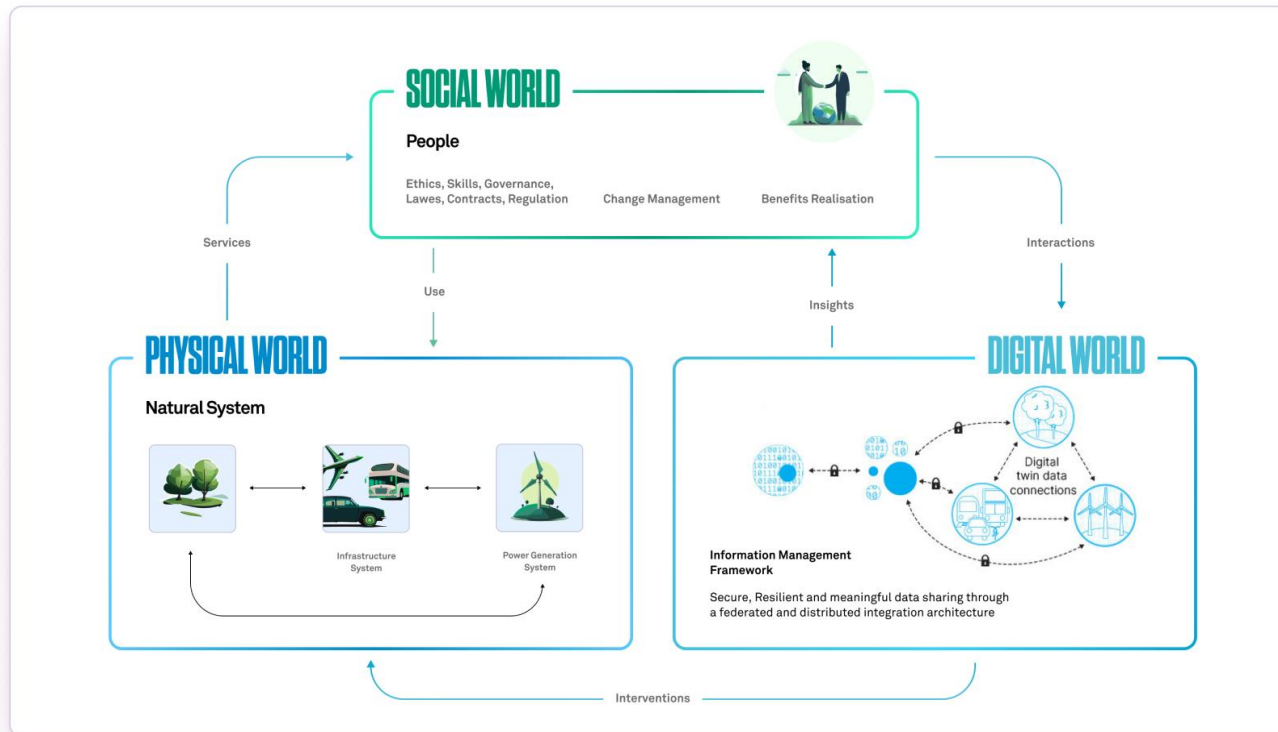
A digital, dynamic city plan for Adelaide's future

The City of Adelaide is defining a unique vision for its future which aims to shape a dynamic, thriving city with opportunities for economic and sustainable growth. We designed the City Plan with architects City Collective and collaborated with architects Malloway Studios and Aboriginal Urban Design, a consultancy which provides First Nations perspective and context. Together, we established an approach to support Adelaide City Council's urban planning strategy and provide a blueprint for sustainable growth.

Gemini Papers, CDBB

Blueprint for better public infrastructure

Arup, having actively supported the CDBB since its inception, was asked to lead the authoring of the Gemini Papers. Supporting our expertise in the field of connected digital twins, the Arup Foresights group brought strategic visioning and messaging experience that was vital in packaging the NDTp's accumulated knowledge for maximum impact.



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