

# The UK's Digital Construction Capability

Green Buildings: An Innovative Path to NetZero through Building Safety, Diversity and Digital Construction

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# What is digital construction?

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**Digital construction is an integrated approach to the design, delivery and operation of the built environment.** In digital construction, digital services are used to make better decisions about the new assets we build, and how we can make the best use of the existing assets to improve the built environment.

**It includes the application of methodologies, standards, and processes through digital technologies.** It is underpinned by good practice in information management during the planning, design, build and operational phases of the asset lifecycle.

Digital construction is not delivered by one product or service; rather, **it is the combination of people, process, and technology, which allows for better decision-making** about the assets that we build and use in everyday life.



# What do you get when you buy UK?

**Better Economic Outcomes.** Digital construction methodologies, such as BIM, has resulted in:

- Up to an 80% reduction in the time taken to generate a cost estimate.
- A reduction in unbudgeted change by up to 40%.
- Contract value savings of up to 10% through improved construction coordination; and
- A 7% reduction in overall project delivery time.

In addition, information management could secure between £6.90 and £7.40 in direct cost savings for every £1 invested.

**Better Environmental Outcomes.** Digital construction is a key enabler to reaching net-zero targets, with the UK championing methods to calculate embodied carbon, the energy efficiency of assets, and whole-life carbon footprints.

**Better Social Outcomes.** An important social outcome of digital construction is its power to build digital skills and knowledge, creating jobs and reskilling workers to participate in the digital economy.



# UK digital construction value proposition

## OUTCOMES FOCUSED

- Outcome driven BIM benefits
- Outcome driven Digital Twins
- Outcome data visualisation – mapping to SDGs

## NET ZERO

- Model embodied Carbon
- Whole life Carbon Modelling
- Materials measurement using BIM
- Sustainability Optioneering

## PRODUCTIVITY

- Efficiencies via BIM
- Digital Transformation to harness new technology
- Digitise / Automate processes

## COLLABORATION

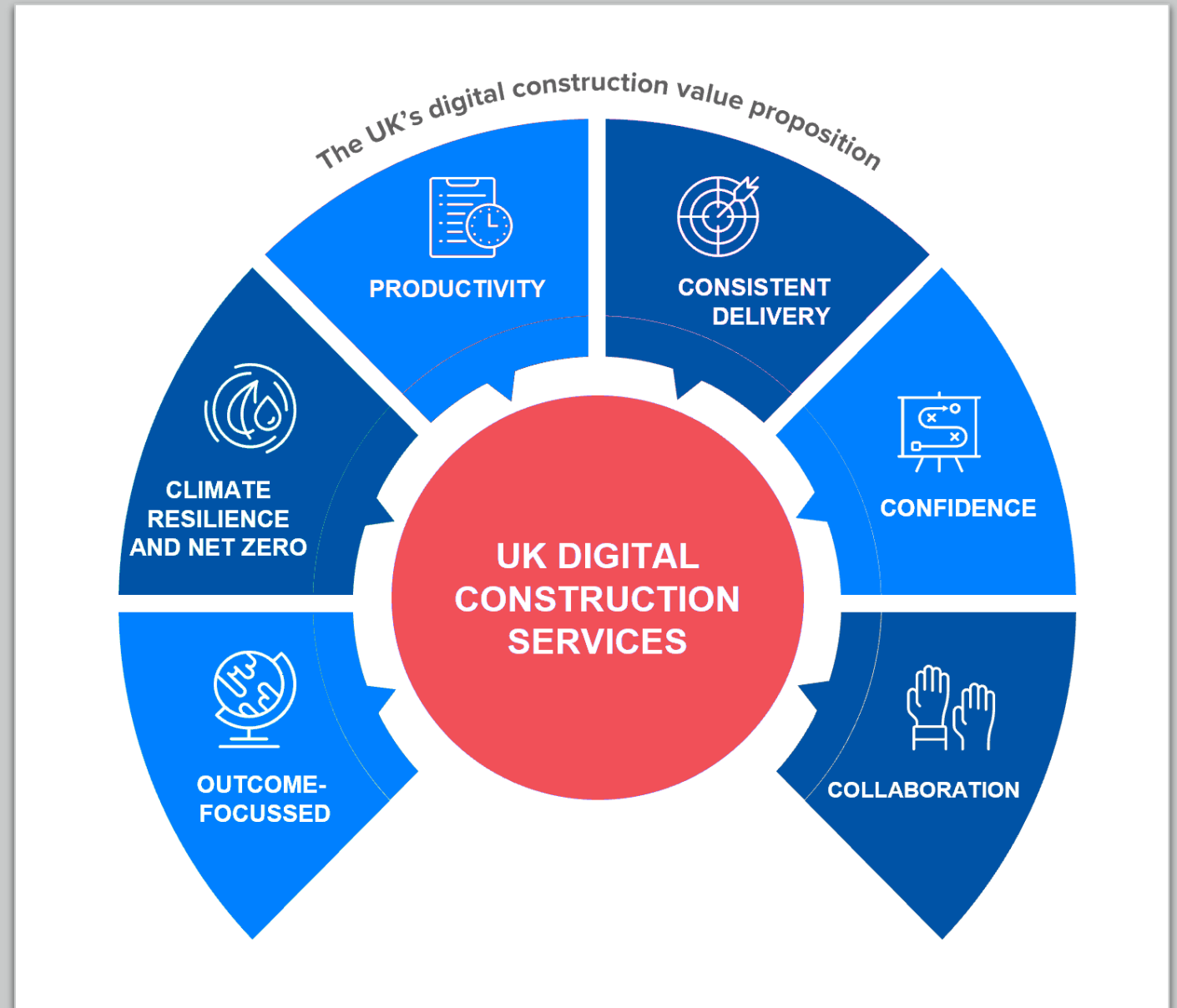
- Common Data Environment
- Collaboration with Communities
- AR / VR for collaboration
- Use of common language for trade – ISO

## CONSISTENT DELIVERY

- Client specific BIM requirements
- Use of ISO BIM standards
- Use of common processes

## CONFIDENCE

- Information Management
- Golden thread
- Use of data during projects
- Cost and Programme confidence using BIM





# Why buy UK digital construction?

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**Consistent delivery.** The use of the UK's standard-based approach to digital construction enables reliable and well-informed decisions to be made about what assets are built, used and maintained.

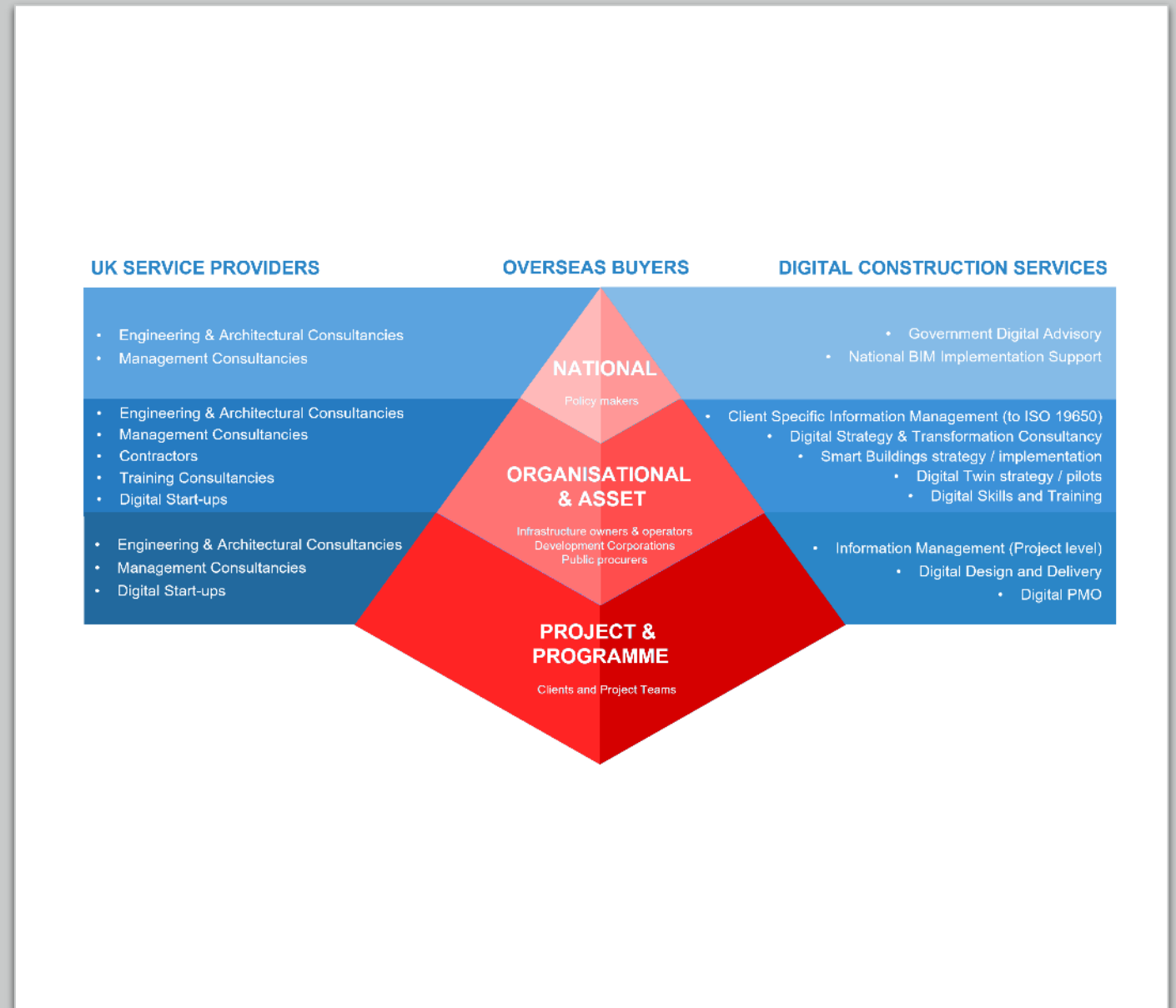
**Productivity.** Digital construction offers vast potential to enhance the productivity of organisations, programmes and project teams.

**Confidence.** The UK's client-centric approach gives clients the confidence that the information they need to make decisions will be supplied. This allows for transparent interrogation of information to understand the progress, risks and costs related to project delivery.

# Oversees buyers of UK digital construction expertise

The UK's digital construction services are offered across three distinct client levels.

Clients are grouped at the national, organisational & asset, and project & programme levels.







# What can UK digital construction do for you?

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**Application of technology** In digital construction, technology is used to collect and exchange data about the built environment. British expertise in the innovative use of Building Information Modelling (BIM) and advanced technologies such as cloud computing, digital platforms, georeferencing, data visualisation software and digital twins enables better ways of working.

**Digitalised processes** Functionally, digital construction enables better ways of working through the application of digital technology and standardisation of process. When implemented through BIM, digital construction improves procurement, information management, programme and project management, health and safety, sustainability, digital security and cybersecurity across assets and estates.

**People** Digital construction is a service-based offering, provided by skilled professionals who apply digital technologies to improve existing service delivery and offer new services across the infrastructure asset life cycle. Professionals working in digital construction include architects and engineers who design inclusive infrastructure, contractors and project managers who build assets, and facilities and estate managers who make sure that assets are well maintained for use by everyday citizens.

# National Level

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Digital Construction use cases for policy makers at the national and subnational levels





# Government digital advisory

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**Service:** Advice to governments regarding national-level, public-sector-driven implementation of digital construction, using lessons learnt from the UK's national digital construction adoption programme. Typically, this relates to the adoption of BIM in policy and public procurement, but it could cover wider digital transformation.

**Why is the service required:** The creation of policy and national digital strategies have been proven to provide a key lever for modernising the sector and improving its performance and the quality of the built environment.

**Typical buyer:** Policy-makers.

**Example of service delivered:** Case study: **Gleeds** - Peru government to government.

**Typical service providers:** Engineering consultancies, architectural consultancies, management consultancies.





# National BIM implementation support

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**The service:** Tried and tested support in the creation of national level BIM implementation plans, covering the establishing of leadership, setting the vision, the use of strategic levers, the creation of collaborative frameworks, the formation of communities and the promotion of capacity-building.

**Why is the service required:** National-scale transformation requires a change management approach that builds momentum, while putting in place the foundations for scaling up the use of BIM across public procurement and supply chains.

**Typical buyer:** Policy-makers, public procurers.

**Example of service delivered:** Case study: Peru Reconstruction Authority.

**Typical service providers:** Engineering consultancies, architectural consultancies, management consultancies.



# Organisation Level

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Digital construction use cases for infrastructure owners & operators, development corporations, public procurers and infrastructure investors



# Client-specific information management (to BIM – ISO 19650)

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**The service:** Supporting the development of client-specific documentation that clearly defines what information is needed, aligned with the ISO 19650 suite of documents. Carried out in various ways, including stakeholder engagement meetings and workshops to establish the key information needed to review and approve stages of projects.

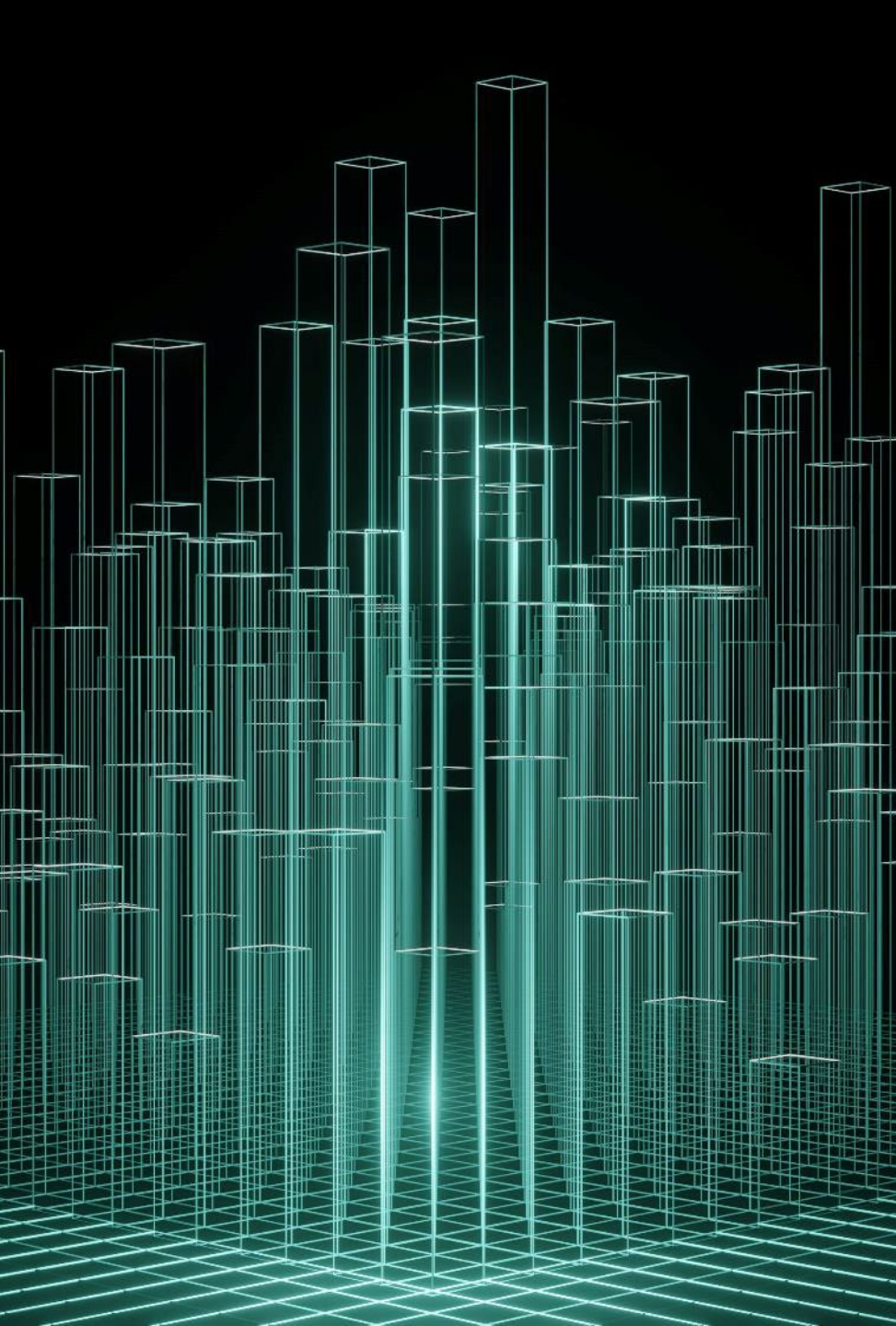
**Why is the service required:** It enables clients to specify what digital information they require at each stage of a project and to streamline reviews, approvals and to provide correct data for use during operation.

**Typical buyer:** Public procurers, infrastructure owners and operators.

**Example of service delivered:** Case study: **Mott MacDonald** - Middle Eastern Transport Authority.

**Typical service providers:** Engineering consultancies, architectural consultancies, management consultancies.





# Digital strategy and transformation

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**The service:** Digital strategies that provide direction, priorities, and practical steps to harness digital initiatives that support business transformation.

**Why is the service required:** Strategies form intent and are a vital communication tool for colleagues, customers and supply chains. Digital strategies must address the people and change side of digital advancements, in addition to process and technology enhancements.

**Typical buyer:** Public procurers, infrastructure owners and operators, development corporations.

**Example of service delivered:** Case studies: **MACE** - digital strategy for a global financial client and **Operam** - Aurecon digital transformation.

**Typical service providers:** Engineering consultancies, architectural consultancies, management consultancies.



# Digital twin strategy and implementation

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**The service:** Helping clients to make sense of the term “digital twin” and to understand the purpose and value of this emerging technology within their businesses. Once this is clear, digital twin pilots can be created that use real data to trigger decisions or maintenance or support the management of assets; some have a public-facing outcome that widens their reach and amplifies the benefits.

**Why is the service required:** Digital twins are relatively new to the construction sector, and the technology is promoting much discussion and communication, which can be overwhelming or contradictory. UK service providers can help to cut through the noise to help asset-owning and maintaining organisations understand the value they create. The first step is to support the formation of strategies that help articulate the vision and set requirements for digital twin use. Following this, pilot digital twin use cases are being created to test the concept and establish the business case for investing in outcome driven digital twins, that can positively impact operations and society.

**Typical buyer:** Infrastructure owners and operators.

**Example of service delivered:** Case study: **Mott MacDonald** - Bangkok flood decision support tool.

**Typical service providers:** Engineering consultancies, management consultancies technology companies/start-ups.





# Smart buildings strategy and implementation

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**The service:** Smart buildings services support asset managers with the digital tools and knowledge required to overcome the challenges faced through the operation and maintenance of complex facilities. Smart buildings harness building management and usage information to improve and/or deliver operational performance, sustainability objectives, building user experience and wellbeing.

**Why is the service required:** Benefits include better decision making through provision of consistent, accurate data across building and FM systems including ventilation, heating and occupancy. Greater oversight of building performance, allowing for continuous monitoring and increased efficiency of resource usage in line with environmental targets. Integration of asset performance data to inform a move from schedule-based to performance-based maintenance, oversight of life cycle costs, maintenance, warranties and existing service agreements.

**Typical buyer:** Infrastructure owners and operators, prime contractors, development corporations.

**Example of service delivered:** Case study: **Turner & Townsend** - Smart buildings strategy for global finance client

**Typical service providers:** Architectural consultancies, engineering consultancies.



# Digital skills and training

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**The service:** Training on an array of digital skills is required at all levels of organisations, ranging from senior leadership teams' understanding of concepts, to delivery teams that require detailed knowledge of information exchange processes and data analytics. Training on the implementation of ISO 19650 BIM standards for organisations is a strong UK offering, as a result of the ISO standards being based on the British Standard 1192 and suite of Publicly Available Standards, PAS 1192.

**Why is the service required:** People are at the heart of digital construction and change cannot be embedded without people coming on the journey; therefore, the upskilling of the workforce is crucial to successful adoption and embedment.

**Typical buyer:** Policy-makers, public procurers, infrastructure owners and operators, prime contractors, development corporations, project teams.

**Example of service delivered:** Case study: **White Frog** - digital training, **Digital Twins Skills Academy (DTSA)** – City of London Corporation Task Force

**Typical service providers:** Training consultancies, engineering consultancies.



# Project Level

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Use cases for infrastructure clients  
and construction project teams



# Information management (project level)

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**The service:** As part of the ISO 19650 standard roles, projects should have appointed information managers that set up and manage the common data environments, which are used to store and share information and deliverables in a controlled and collaborative way. On larger projects there may be a requirement for a team to provide information management. Such roles have been executed on large and complex UK projects and the learning and experience in successful information management can be applied.

**Why is the service required:** The set-up and implementation of information sharing across the project is crucial to the successful use of BIM and therefore to achieving the potential benefits and efficiencies.

**Typical buyer:** Prime contractors, project teams.

**Example of service delivered:** Case study: **Mott MacDonald** - BART Silicon Valley Phase II.

**Typical service providers:** Engineering consultancies, architectural consultancies, management consultancies.





# Project and cost management including PMO

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**The service:** Building upon information management, digital programme management offerings help clients to leverage project data to drive actionable insights and support data-driven decision-making often referred to as digital project management office (PMO).

**Why is the service required:** Digital programme management can harness data analytics to better understand programme progress, risks and costs. Insights from programme data can improve decision-making throughout an asset's life cycle.

**Typical buyer:** Public procurers, infrastructure owners and operators, prime contractors, development corporations.

**Example of service delivered:** Case study: **Turner & Townsend** - 30 Hudson Yard, New York

**Typical service providers:** Engineering consultancies, architectural consultancies, management consultancies.





# Design service

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**The service:** World-class design of infrastructure and buildings that utilises the latest digital processes, skills and technology. Digital construction is used by UK architectural and engineering design teams to optimise their design processes, to collaborate across regions to utilise the best knowledge and to drive ground-breaking solutions. Digital construction is used to understand embodied and whole-life carbon emissions, to optimise sustainability of solutions and to include communities in the review and improvement of designs.

**Why is the service required:** To improve coordination, deliver better-quality designs and reduce waste/rework. It increases efficiency by introducing processes that get the best out of machines and elevate the value of human activity, as a result of smarter ways of working that are enabled by technology.

**Typical buyer:** Policy-makers, public procurers, infrastructure owners and operators, prime contractors, development corporations.

**Example of service delivered:** Case study: **Mott MacDonald - Metrolinx** and **Turner & Townsend** - Abu Dhabi airport

**Typical service providers:** Engineering consultancies, architectural consultancies, management consultancies.





# Find out more about UK digital construction

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for more information.