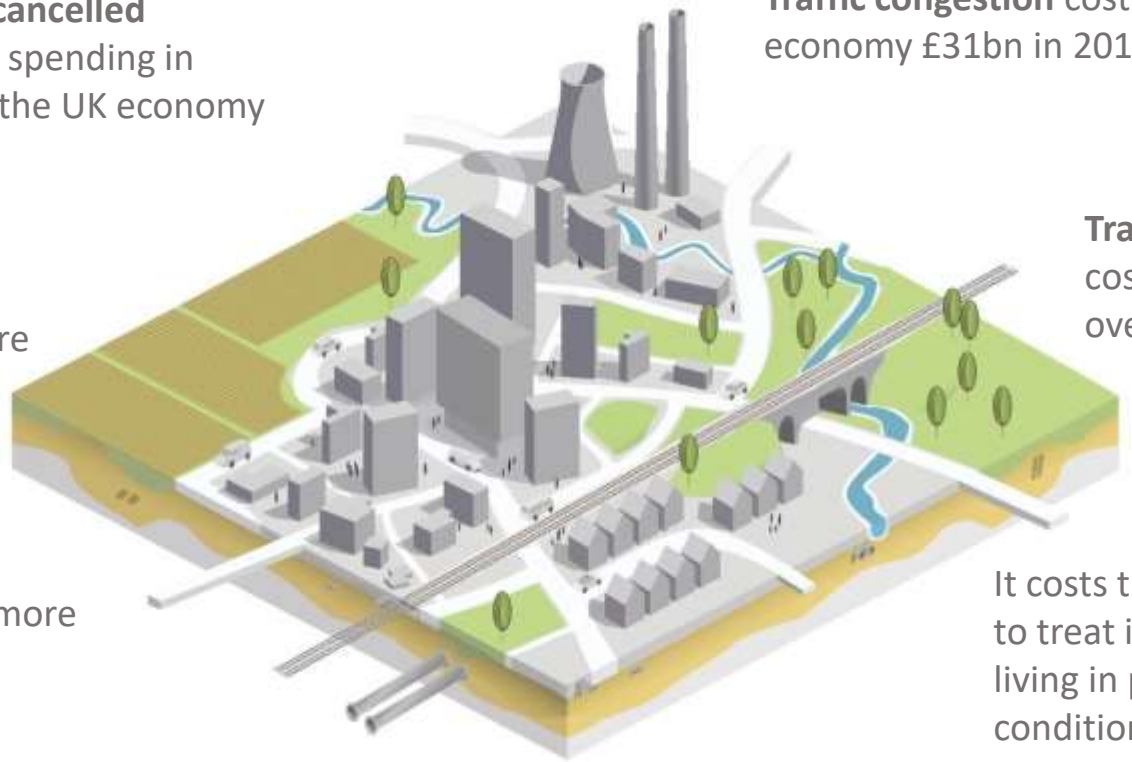
Government Viewpoint: UK construction and the importance of digitalisation

A Presentation to the EDA Digitalisation Forum 2022

UK Built Environment: The Case for Digitisation

Delayed and cancelled infrastructure spending in 2015/16 cost the UK economy £6bn

Traffic congestion cost the UK economy £31bn in 2016



Up to 20% of total construction costs are for **re-work**

Train delays in the UK cost the economy over £1bn annually

Homes and offices consume up to 4x more **energy usage** than designed

It costs the NHS **£600m pa** to treat illnesses caused by living in poor housing conditions in England

The built environment contributes c40% of the UK's total greenhouse gas emissions

Disruption from **flooding** costs the UK economy £1bn pa

Information management (using BIM) and digitisation are central to Government's approach – driving improvements across construction supply chain

Productivity

- **Design**: BIM, Rapid Engineering Modelling, object libraries and configurators
- **Industrialisation**: manufacturing built assets, automation, robotisation
- **Skills**: building digital capability

Improved Operations

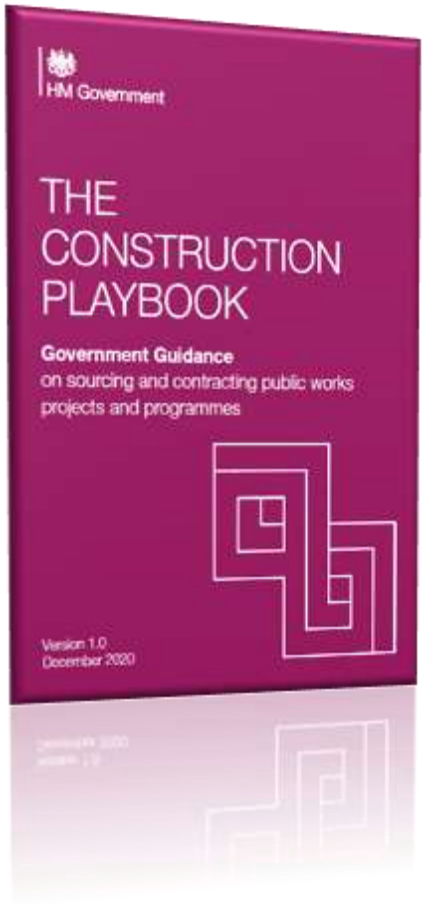
- **Supply chain integration**: better logistics, payment and contractual management
- **Asset optimisation**: interconnected systems, data sharing

Culture Change

- **Collaboration**: improved transparency and information flows within supply chains
- **Quality**: management systems and defect prevention
- **Safety**: Golden Thread of building safety information, site environments, occupational and mental health

Interoperability turns data into information

The ability to exchange and use information securely, ensuring that information is independent of the technologies used to deliver it.

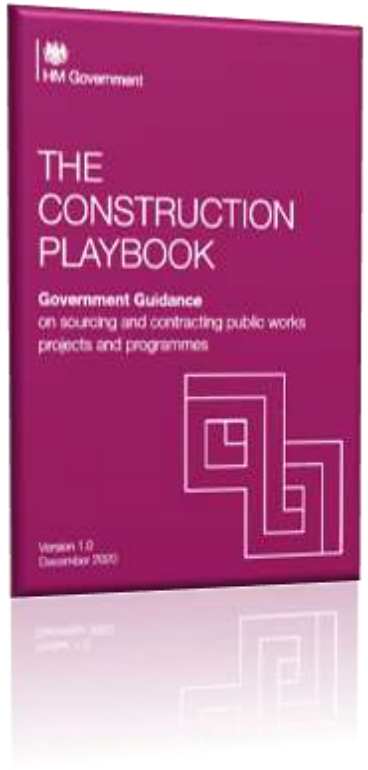


Since 2011, UK Government has aspired to be able to easily exchange **open, shareable asset information**.

- Information to help design and manage the asset, and record changes to it
- Structured information exchanged across the contract line to facilitate a smooth handover
- Information to support operations during the whole asset lifecycle
- Information held in audit trails – ensuring regulatory compliance
- Information that can be exchanged with other assets

As of 2021, **interoperability** is now explicitly highlighted as a key requirement in UK Government construction strategy (expressed in the *Construction Playbook* and the *TIP Roadmap 2030*).

Information management (using BIM), data and digital are central to the Construction Playbook



- Clients need "**a standard interoperable approach for the secure exchange and use of data and information throughout the procurement and project lifecycle.**" (p.23)
- aims to improve safety, cost, speed and quality of delivery, upskill the workforce and **promote "greater sharing of better data"** (Introduction, p.3).
- Endorses the UK BIM Framework:

  *"Contracting authorities should use the UK BIM Framework to **standardise the approach to generating and classifying data, data security and data exchange …**"* (p.3)

Information management is also central to the Transforming Infrastructure Procurement Roadmap to 2030

8. The client (shall)…

"e) have a digital mechanism for defining its information requirements and then procuring, receiving, assuring, and immutably storing, via a system of record, the information that it procures;"

Better information management is now required for buildings within the scope of the Building Safety Act 2022

Key safety information must be gathered, retained, updated and accessible over the lifecycle of a building.

“A robust golden thread of key information (should be) passed across to future building owners to underpin more effective safety management throughout the building life cycle”.

Use digital tools and systems to enable key information **“to be stored and used effectively to ensure safer buildings”.**

“make information easily available to the right people at the right time”.

Information management and interoperability are part of Government's approach to technology procurement

Digital, data and technology considerations (pp.56-62):

- Legacy IT and up-to-date products
- Intellectual property (IP)
- Cyber security risk
- **Open and interoperable data and software**
- API technical and data standards
- Contractual terms and conditions for cloud computing

"data … should be able to be easily exchanged across platforms to make efficient use of the data we own…ensure that all contracts … enable data extraction in a common format … to ensure accessibility and transparency". (p.61)

DDaT Playbook stresses open, interoperable data and code

Open and interoperable data and code

The ability to exchange and share information and data between contracting authorities and suppliers and across government is key for long-term success. Software should be open-source and designed to allow access in a platform-agnostic way. Data should be shared using consistent methods, and primarily with APIs which conform to Central Digital and Data Office API technical and data standards, satisfy the requirements of the Technology Code of Practice (TCoP), and are well documented. Operating in this consistent way will allow the interoperablity between systems which fuels innovation.

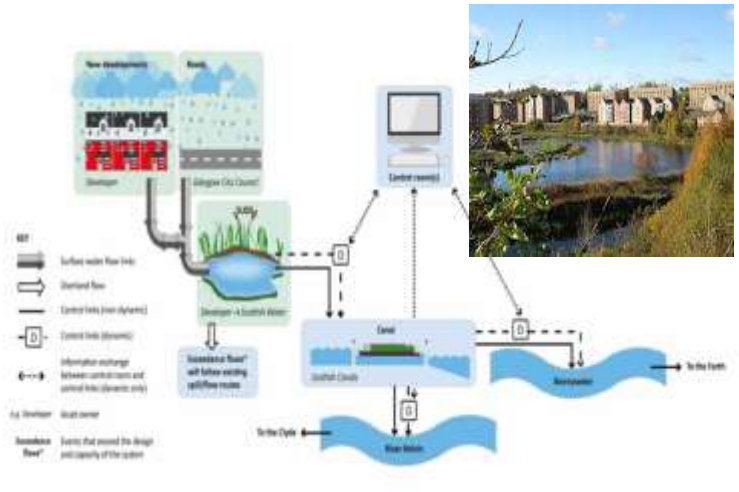
Digitisation and information management are already part of project delivery

A Platform-based approach to schools and hospitals

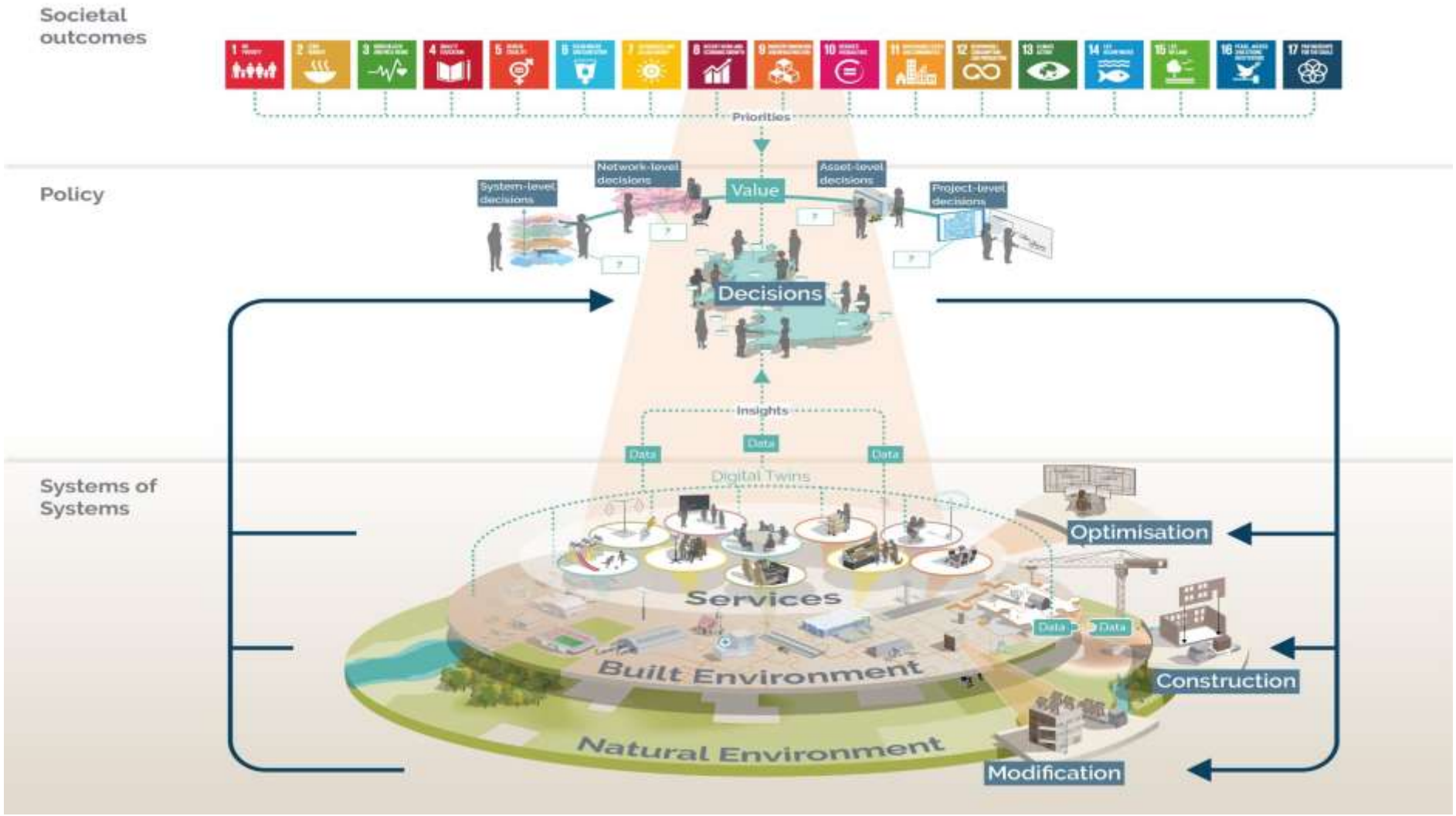
- Uses a **product platform of standardised components**, which are precision engineered and manufactured. Every component is tagged and traceable.
- **75% quicker to deliver** than traditional onsite construction.
- A **70% saving in whole life carbon emissions**, through reduced waste, and improved heat and energy performance.
- **90% of the building can be reused or recycled**.
- Will be used on a £27m school project in 2023.

Glasgow Smart Canal – Climate Resilience

- Repurposes 18th Century canals using modern data analytics and autonomous systems, co-ordinated by a single control system
- Uses weather forecasts to project levels of runoff into the canal, and has full historic data to inform the hydrological model
- 22 outstations monitor water levels and flow, and automatically adjust the water level in the canal, through feeders and sluices
- Cost £17m (est saving £75m), saved 35K tonnes CO_2,
- Enabled regeneration of 110 hectares now safe from flood risk



The Vision for the Built Environment



Fiona Moore
1 December 2022

Government & Industry Interoperability Group

Electrical Distributors Association

Interoperability definition

‘The ability to exchange and use information securely, ensuring that information is independent of the technologies used to deliver it.’

The whole-life information journey and the importance of interoperability

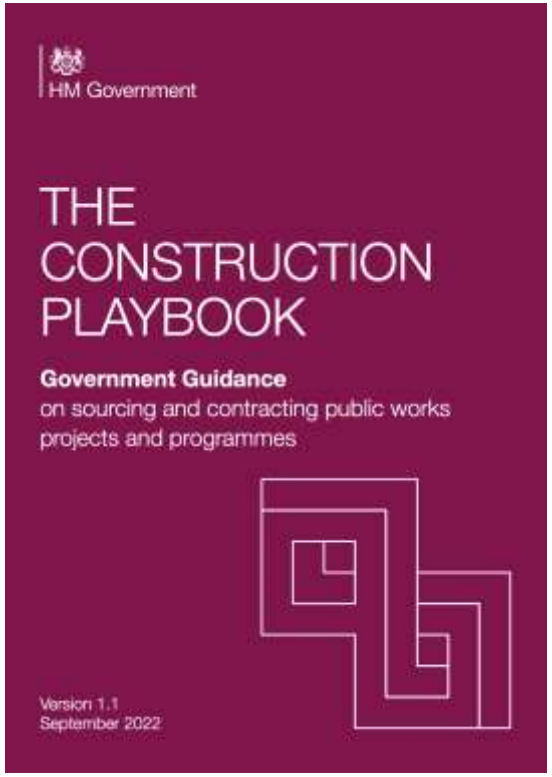
Interoperability definition - context

‘The ability to exchange and use information securely, ensuring that information is independent of the technologies used to deliver it.’

Some of the context:

- Information for a defined purpose
- An audit trail of information
- Information quality / reliability
- Information longevity – for use during the whole asset lifecycle
- Information exchanged digitally across many contract lines

In response to Government Policy



Information activities:

- Specify
- Procure
- Deliver
- Assure
- Store
- Present
- Exploit

GIIG Workstreams

A. Classification
(Sarah Delany / Chris Vickers)

B. Industry Foundation Classes (IFC) & COBie
(Emma Hooper / Nick Nisbet)

C. Information Management Platform (IMP)
(Graeme Tappenden / John Hall)

D. Technologies & Openness
(Paul Wilkinson)

E. Procurement for Interoperability
(Simon Lewis)

F. Standard Information Approach
(Anne Kemp / Julian Schwarzenbach / Shahida Rajabdeen)

With input from industry, working collaboratively.

Our Ethos - Debate and Consensus

We thrive on debate with the aim of reaching consensus, and if consensus is not achievable, then we will at least help move the discussion forward, with the aim of achieving real long-term progress and value.

1. Have a clear understanding of the objectives
2. Always share your opinion and your reasoning
3. Listen and learn – this is the strength of the team
4. Respect one another, with the aim of understanding different viewpoints
5. Be prepared to adapt your opinion
6. Accept that no individual can provide all the answers
7. Lead by example
8. Help to grow consensus across **all stakeholders**


Classification
Sarah Delany
Technologies
Paul Wilkinson
Administration & Oversight
Louise Dobson
Classification
Chris Vickers
IMP
John Hall
IMP
Graeme Tappenden
IFC & COBie
Emma Hooper
Standard Information Approach
Julian Schwarzenbach
Standard Information Approach
Anne Kemp
Standard Information Approach
Shahida Rajabdeen
Procurement
Simon Lewis
Engagement
Nicola Pearson
Technical Lead
Fiona Moore
Nick Nisbet
IFC & COBie

Technologies
(Environment Agency)

Karen
Alford

Classification
(IAM)

Julian
Schwarzenbach

Procurement
(CCS)

Andrea
Fitzgerald

GIIG

CHAMPIONS

IFC & COBie
(buildingSMART - BSUKI)

Casey
Rutland

Anne
Kemp

IMP
(nima)

Fiona
Moore

Standard Information Approach

Published Resources

Published to date:

- Glossary
- IMP Guidance Document
- IMP Case Study
- JCT & NEC4 Contract Clauses
- IMP Functional Requirements Tool

https://www.cpni.gov.uk/information-interoperability