A short introduction to Built Asset Information Management

FOR PROCURERS

Introduction

This guide is for those procuring construction contracts within government and more widely who may be unfamiliar with the principles and practice behind information management (IM)[1]. This guide provides an overview of these principles and links to where further information can be found. It is not intended to act as legal advice on the use of IM; specific legal advice should always be sought in relation to particular projects or issues.

Throughout this guide, 'IM' specifically refers to the IM required to support the planning, design, construction, handover, operation, repurposing and decommissioning of built assets, be they buildings or infrastructure.

[1] The GIIG Glossary 7 on page 5. defines IM as 'The process by which an organisation, with appropriate security controls, specifies (including provisions for data quality and provenance), procures, assures, stores, presents, and exploits its data to perform its core business.'

BIM to IM

Building Information Modelling (BIM) is often thought to be a 3D or virtual model of a physical asset which is employed during the delivery phase. While this visual aspect of BIM can be part of the process, it is not the only part and in fact it is not strictly necessary to have a 3D model at all to have a viable IM process. The term 'BIM' has become rather vague and capable of being misunderstood as a result of this early emphasis on the 3D model (some also suggest the term 'better information management' to highlight its progressive nature, and also to be more inclusive of assets other than buildings).

A more accurate and helpful way to think about BIM is to concentrate on the information elements rather than the visual. The change of terminology from BIM to IM helps this shift in emphasis. This also reflects the change in the underlying standards framework from the BS 1192 series to the ISO19650 series, discussed on page and 4.

Another misconception is that BIM is solely or mainly about technology. As procurers of physical assets, you should also procure information about those assets, which adds value to them throughout their life. That information will need to exist independently of the technologies used to produce or consume it – hence the focus on IM[2].

It should also be remembered that IM continues throughout the lifecycle of the physical asset and is equally applicable during the operational pha

se. In the same way that a car with a full service history is more valuable than a car without, an asset supported by a comprehensive information record will be more valuable than one with no information support.

Good IM provides a commonly-understood, clear and standardised process for managing information digitally during the life cycle of a physical asset. Establishing and maintaining an audit trail of information also enables cost savings to be made in the design, build and operate processes, avoids disputes and misunderstandings and allows information to be accessible, verified, and capable of being relied upon over the lifetime of the asset.

[2] This information-centric (as opposed to technology-centric) approach is an important aspect of interoperability. See the definition of "interoperability" on page 5.

Standards framework underpinning

The use of IM is increasingly underpinned by a global standards framework. This framework details the processes which encompass the concept phase, the design and build phase, the commissioning and handover phase and the maintenance/in-use phase. The framework covers how data can be exchanged in a security-minded way over the life cycle of the physical asset. Originally this regulatory framework could be found in the BS 1192 series. This series is gradually being replaced by an international standard: ISO 19650, and at the time of this note, this replacement process is nearly complete: a replacement for PAS 1192-6, which relates to collaborative sharing of health and safety information throughout BIM, is currently being developed.

The current UK versions of the ISO standards[3] are:

(a) BS EN ISO 19650-1: Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) – Information management using building information modelling: Concepts and principles;

(b) BS EN ISO 19650-2: Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) – Information management using building information modelling: Delivery phase of the assets;

(c) BS EN ISO 19650-3: Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) – Information management using building information modelling: Operational phase of the assets;

(d) BS EN ISO 19650-4: Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) – Information management using building information modelling: Information exchange;

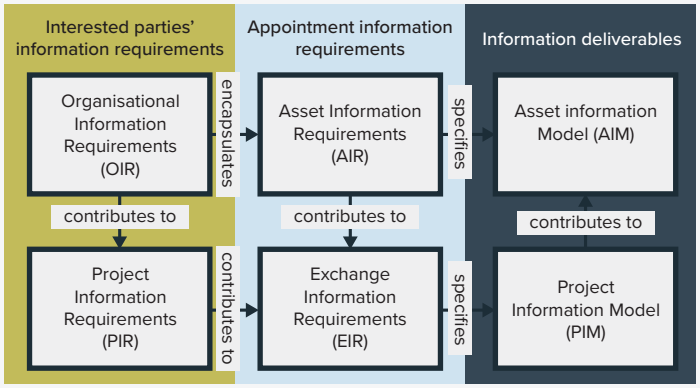
(e) BS EN ISO 19650-5: Organization and digitization of information about buildings and civil engineering works, including building information modelling (BIM) – Information management using building information modelling: Security-minded approach to information management

[3] All available from the BSI website

Standards framework underpinning (cont.)

Linked to, and complementing, the ISO 19650 series in the UK is a National Annex providing a UK-specific context, together with a comprehensive resource of information, guidance and standards: the UK BIM Framework[4].

The first part of the ISO 19650 series, which deals with concepts, emphasises how the various aspects of the process interact with each other in an iterative loop during the lifetime of the asset. This can best be summarised in the diagram below from ISO19650-1[5]:



NOTE: In this figure, 'encapsulates' means 'provides the input to', 'contributes to' means 'provides an input to', 'specifies' means 'determines the content, structure and methodology'.

As this diagram indicates, the information you need to consider includes the client's organisational and asset information requirements (OIR and AIR) as well as the information relevant to the specific project (PIR and EIR) leading to the information deliverables (AIM and PIM)[6].

[4] UK BIM Framework
[5] Figure 2, page 9
[6] Note that the EIR is used during the operational phase of the asset lifecycle as well as the design and delivery phase.

Interoperability

Interoperability underpins and facilitates the entire IM process. It is therefore a prerequisite for the effective operation of the ISO 19650 series. It is defined as the ability to exchange and use information securely, ensuring that information is independent of the technologies used to deliver it[7].

Without interoperability, IM cannot work efficiently. Exchange and use of information requires the security-minded specification, procurement, delivery, assurance, storage, presentation and exploitation of information to enable the long-term operation, maintenance and safe, secure, resilient and sustainable use of the physical asset. Growing emphasis is being placed upon the audit trail of information relating to physical assets that fall within the scope of the Building Safety Act 2022 (the 'Golden Thread'), and requirements for verifiable and traceable information are likely to become ever more widespread in the future. For this reason, interoperability is increasingly important. Together with the ISO 19650 series and the UK BIM Framework, interoperability is referenced in two key documents: the *Construction Playbook*[8] and the *TIP Roadmap*[9] (see the Information Management Mandate in Annex B)[10]. It is also the driver behind the formation of the Government & Industry Interoperability Group (GIIG) whose purpose is to address how practically to deliver interoperability.

[7] GIIG Glossary, available at www.cpni.gov.uk/information-interoperability

[8] The Construction Playbook - GOV.UK (www.gov.uk)

[9] Transforming Infrastructure Performance: Roadmap to 2030 - GOV.UK (www.gov.uk)

[10] Improving interoperability is also a recurring theme in the Government's digital, data and geospatial strategies and (among other policy guidance) in its Technology Code of Practice.

IMP

The GIIG has been developing the concept of an Information Management Platform (IMP) which enables the secure transfer of structured information between a physical asset owner and its supply chain. An IMP is not a proprietary software product: it is a client-operated and maintained process and technology suite. Combined, the process and technology enable security-minded specification, procurement, delivery, assurance, storage, presentation and exploitation of information, derived internally or from third parties, over the lifecycle of an organisation's physical assets. The IMP offers the client a repeatable, structured process which allows it to optimise its digital information.

While the structures, processes and components of the IMP are on the client's side of the contract line, it will be necessary to specify what is required from tenderers contracting with clients using an IMP as part of the procurement process. The GIIG is currently preparing this guidance and related template contract provisions.

The GIIG has published an IMP guidance document and an Environment Agency IMP case study. These are available on the information interoperability webpage.

Contracts and procurement

It is not sufficient when preparing a contractual procurement process simply to state that the project must 'use BIM' or 'use the UK BIM Framework', or words to that effect. The client itself must also follow the UK BIM Framework and, as procurer, specify precisely what it needs and how the information generated by the asset is to be managed, including its requirements for handling sensitive information. A guide to the documentation which is expected to be generated by the client, the contractor and others involved in information management aspects of the asset can be found on the UK BIM Framework website[11].

The principles and procedures which underlie the ISO 19650 series, the interoperability agenda and best IM practice should be reflected in the procurement process. The two forms of contract most commonly used by government procurement teams (the NEC4 and the JCT D&B 2016) have both published guidance about the incorporation of BIM into the contracts. The NEC4 already has an optional clause (Option X10) that deals with BIM, but has also published Practice Note 6 (PN6) which deals with the incorporation of an IM protocol (explained further on page 8.) into the contract. In 2019, the JCT published a guide to incorporating BIM into JCT contracts, also including the addition of an IM protocol.

[11] Guidance – UK BIM Framework – see in particular Guidance Part E

Contracts and procurement (cont.)

There are two such protocols – one covering the delivery phase and linked to BS EN ISO 19650-2 and the other dealing with the maintenance/in-use phase and linked to BS EN ISO 19650-3. These protocols gather the relevant legal requirements that need to be incorporated into contracts to deal with the legal aspects of IM (see the resources section of the UK BIM Framework website).[12]

The GIIG has published further suggested amendments to the NEC4 and JCT D&B 2016 contracts which can be found, together with guidance notes on the information interoperability webpage. These amendments incorporate the most recent versions of the IM protocols together with clauses aimed at embedding interoperability, Construction Playbook principles and a security-minded approach into the contracts[13].

A glossary of terms setting out the definitions of words which the GIIG uses regularly as a step towards establishing an industry-wide understanding of certain commonly-used words and phrases in this area is also available on the information interoperability webpage. The GIIG glossary will be updated on a regular basis and the GIIG will continue to publish further information in this area as it becomes available.

Further enquiries

If you have any questions in relation to this note, please contact the GIIG at: enquiries@giig.digital

[12] Resources – UK BIM Framework A guidance note accompanying each protocol is also available on the website.
[13] The GIIG will also shortly publish on its website a guide to structuring information through information delivery specifications and use cases.