The Value of BIM and Information Management through the Project Lifecycle

Turner & Townsend

SCSI Chartered property, land and construction surveyors

Turner & Townsend

Agenda

- Introductions
- Overview
- BIM & Information Management Process
- Summary
- Q&A

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1 | Introduction

Gary Bell

Principal Consultant

- Technology Consultant
- Regional Lead for the North East
- BIM and Information Management Service Line Lead
- Support clients in the creation, implementation and management of digital strategies
- Support clients' BIM goals, asset management objectives and maximise value for all stakeholders.

2 | T&T Technology

Our Philosophy

Forward-thinking – how we will work tomorrow, consider the future of data

Careful planning – meticulously plan to define outputs and outcomes early

Shared understanding – create a collaborative culture, aligning understanding and purpose

Transparent – help you access and own better information to make better decisions

Independent – advocate and use open source information; we are software agnostic.

100+

Team members

Diverse skills

Design
Engineering
Construction
Asset Managers
Cost and commercial
Data science
Advanced Mathematics
Developer
Robotic application
Military security

8

Global regions

>300

Projects delivered

Our Services

Digital Maturity and Transformation

Technology Business Change Management

BIM and Information Management

Connected Assets and IoT

Management Information and Reporting

Asset Security

Reality Capture

3 | Our Industry Influence

Organisation	bsi.	ISO®	UKBIM ALLIANCE Enabling Digital Transformation	CONSTRUCTING EXCELLENCE	ICG INFRASTRUCTURE CLIENT GROUP	Defence Infrastructure Organisation
Contribution	PAS185:2017 PAS186:2020	ISO19650-1:2018 ISO19650-2:2018 ISO19650-4 WIP	UK Vice Chair: BIM4Security H&S4BIM BIM4Housing NI BIM Task Group	Vice Chair Digital Construction	Digital Transformation Task Group	BIM Special Interest Group (Security)
Organisation	Ministry of Justice	britishaviationgroup	HSE Health & Safety Executive	The Institute of Asset Management / cdbb Centre for Digital Built Britain	The Institute of Asset Management	yic
Contribution	BIM Special Interest Group	Security Working Group	Post Implementation Review Working Group	Project managing working group and guidance on Digital Adoption in Asset Intensive Organisations	Leading and project managing subject guidance on Asset Information Systems (including CAFM)	Authored guidance on Strategic Asset Management Plans

buildingSMART Professional Certification · RICS · The Institute of Asset Management · THE SECURITY INSTITUTE · Chartered Institute of Information Security

IM/BIM

Overview

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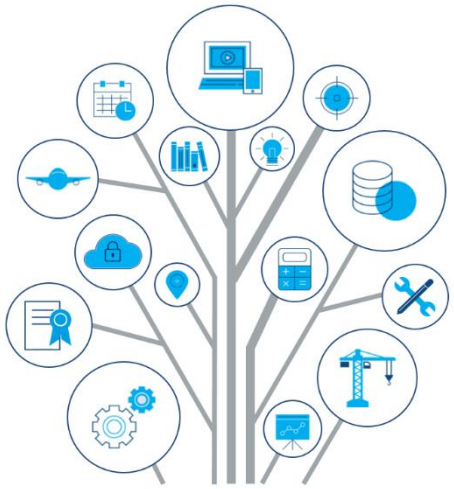
4 | BIM and Information Management

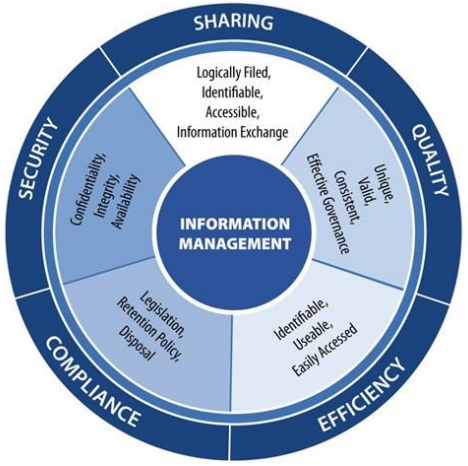


Building Information Modelling

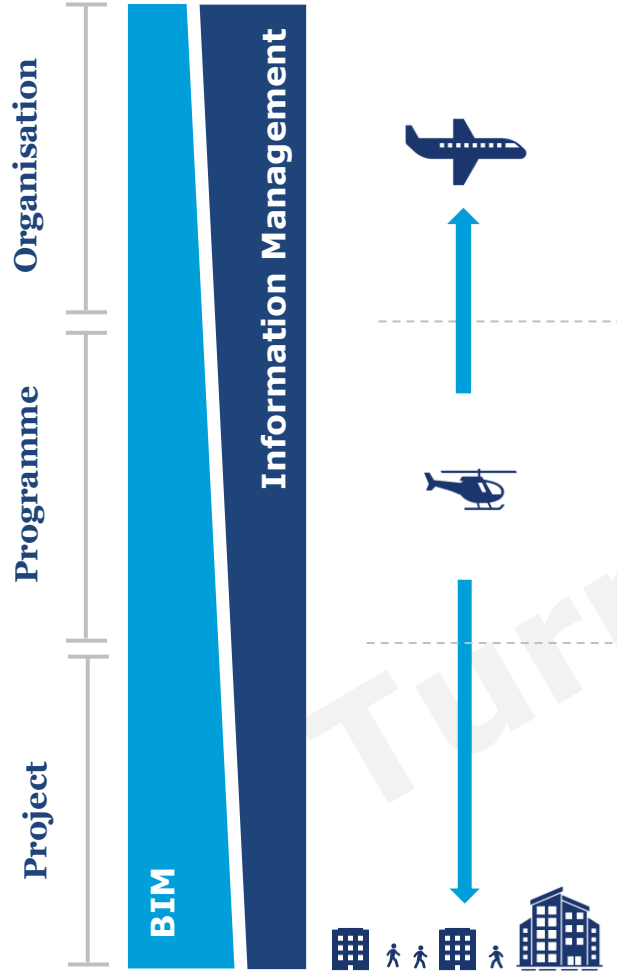
BIM is the process of creating and managing information, digitally, across a construction projects life-cycle. It is the digital representation of a built asset and used to facilitate design, construction and operations processes. It enables a collaborative environment, and fundamentally seeks to ensure that appropriate information is created in a suitable format and exchanged at the right time, to enable more informed decision making.

Information Management

Information management establishes the protocols for collection, storage, curation, dissemination, archiving and destruction of information in all its forms throughout the whole life cycle of the asset. Organisations can rely on the exchange of accurate and timely information to make informed, cost-effective decisions. Effective information management enables project teams to use their time, resource and expertise efficiently to improve decision making and fulfil their roles.



5 | BIM and Information Management

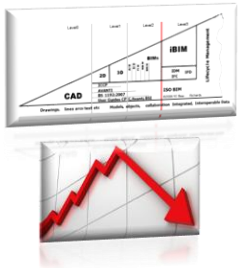


	Overview	Outcome
Organisation	Understanding client enterprises - developing meaningful strategies and operating models that are grounded in extensive experience of implementing complex solutions at tactical and practical levels.	Vision, strategy, route map, operating models, business cases
Programme	Setting up and transforming organisations – implementing target operating models, delivering and managing change across organisational functions to improve effectiveness. Building capability, optimising processes, and developing technology solutions that enable your teams to maximise value from data and information.	Functional strategies and set up, change and transition management, lighthouse project delivery, framework set-up
Project	Delivering efficient and effective solutions – experienced and expert teams supported by modern technology solutions and unparalleled industry information.	Project delivery and management, continuous improvement

6 | History

Avanti Programme published

2004

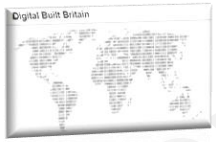


Global Financial Crisis, The 'Wedge' first issued

2008

BIM Task Group formed, Government Construction Strategy is published

2011



DBB strategy published

2015

Grenfell disaster, CDBB, BSI ISO

2017

UK BIM Framework established

2019

Fire Safety Act 2021

2021

2007

BS 1192:2007 is published

2010

Sustainability becomes priority

2013

PAS 1192-2:2013 is published, RIBA PoW updated, PAS91

2016

UK BIM Alliance established and DBB re-launch

2018

Hackitt Review issued, Gemini Principles

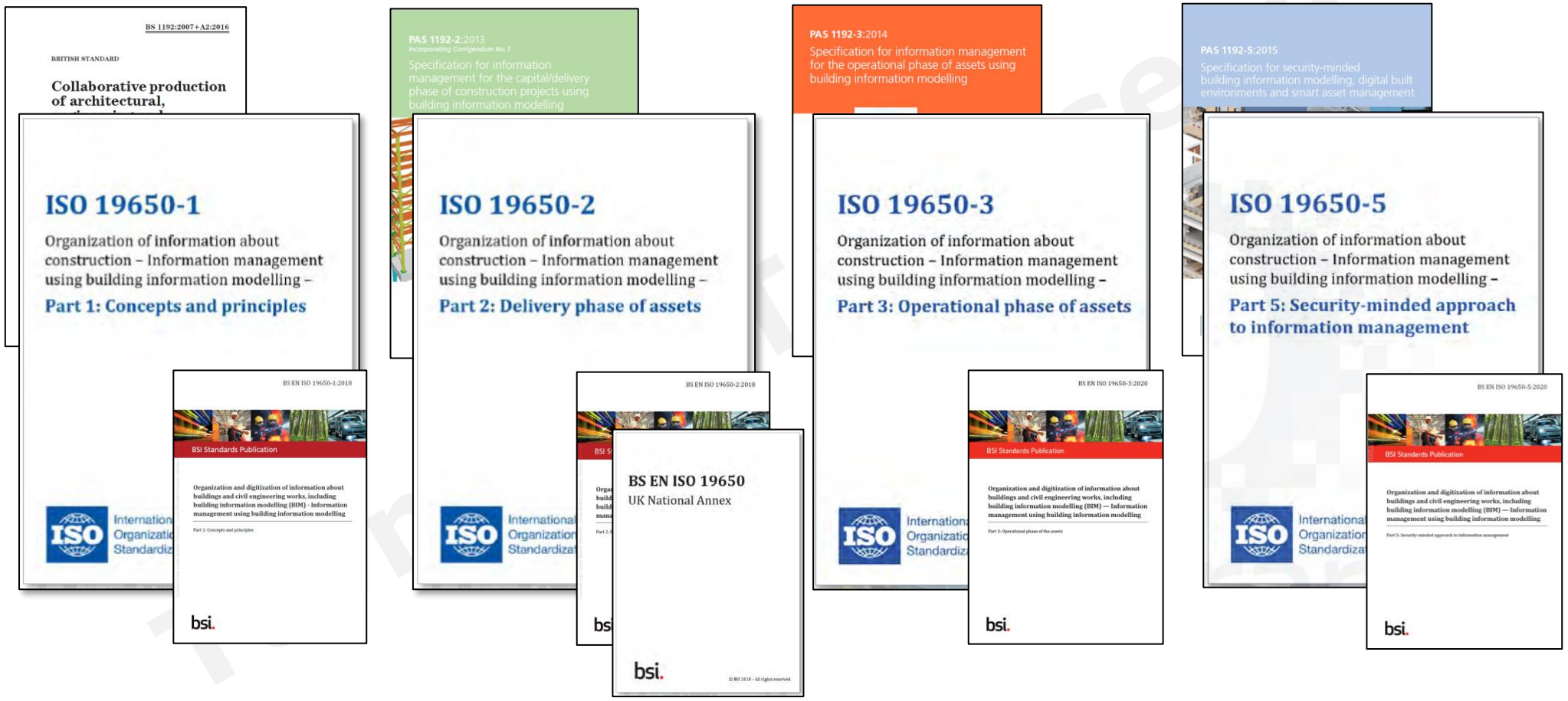
2020

The Construction Playbook

202?

CDM Regs 202?

7 | International Standards



ISO 19650-1

Concepts and principles

ISO 19650-2

Delivery phase of assets

ISO 19650-3

Operational phase of assets

ISO 19650-5

Security-minded approach to information management

8 | Standards Application

Suppliers and Manufacturers	Consultants and Contractors	Owners and Operators	Asset/Facility Managers
BS EN ISO 19650-1:2018 Concepts and Principles			
	BS EN ISO 19650-2:2018 Delivery Phase of Assets		
		BS EN ISO 19650-3:2020 Operational Phase of Assets	
	BS 1192-4:2014 Fulfilling employer's information exchange requirements using COBie Code of practice		
		BS EN ISO 19650-5:2020 Security minded approach to Information Management	
	PAS 1192-6:2018 Specification for collaborative sharing and use of structured Health and Safety information using BIM		
	BS 8536:2015 (1-2) Briefing for design and construction		
BS 8541:2012 (1-6) Library objects for architecture, engineering and construction			**BS 8541:2012 (1-6)** *(In-house projects)*

IM/BIM

Process

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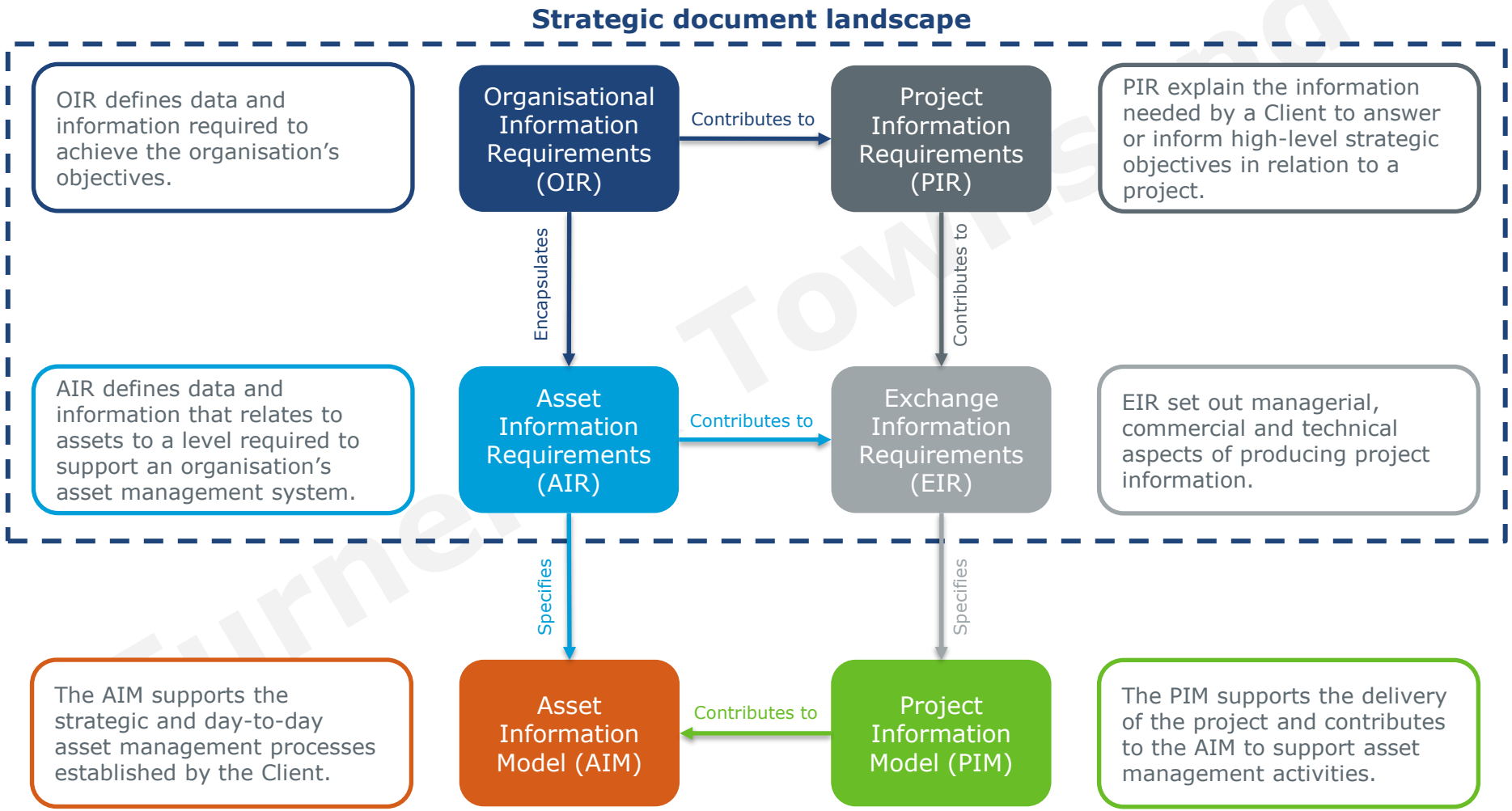
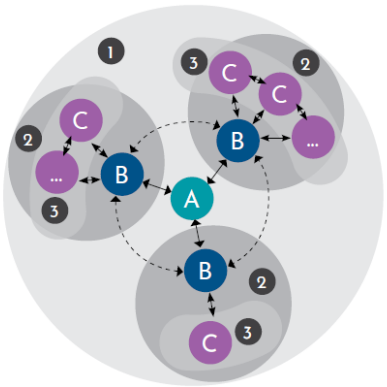
9 | Strategic Documents



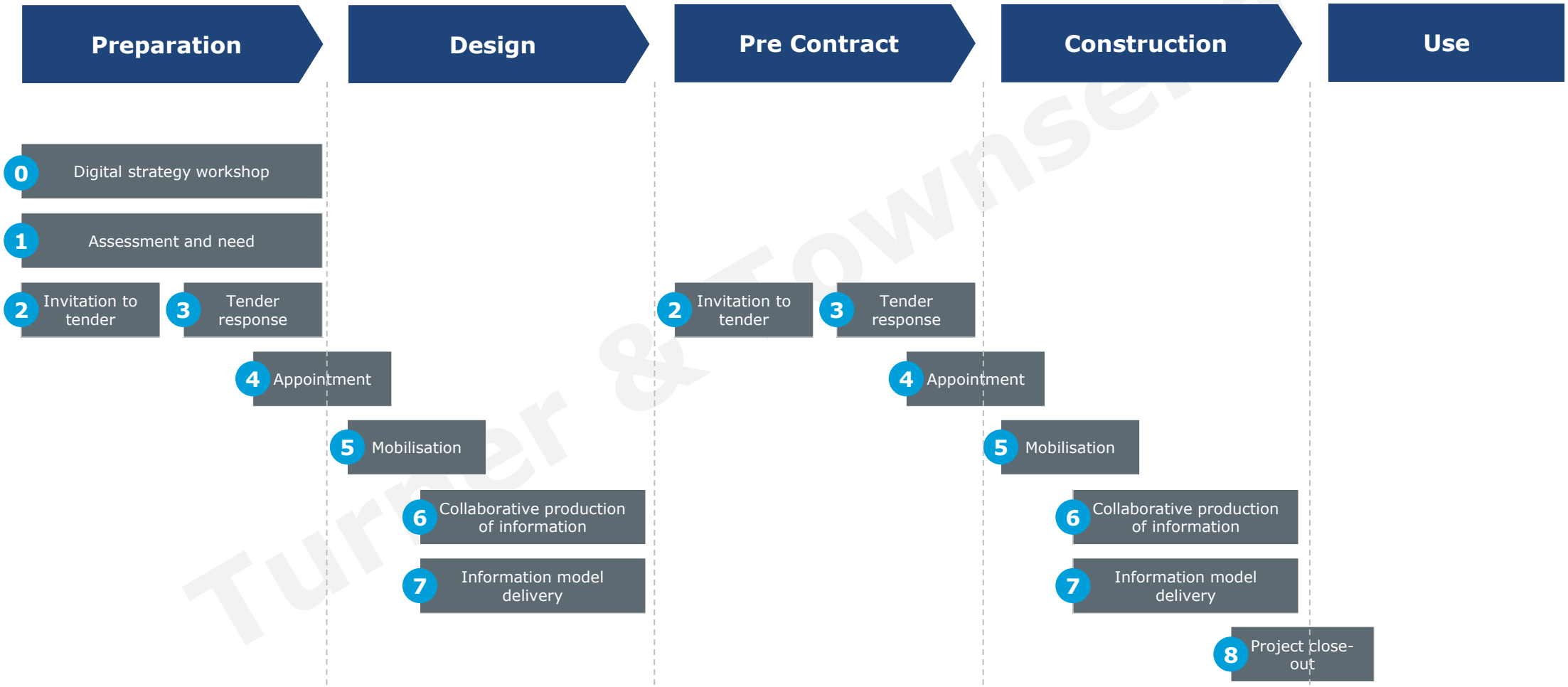
10 | Project Responsibility Mapping (ISO 19650)

Assessment and Need	Invitation to Tender	Tender Response	Appointment	Mobilization	Collaborative Production of Information	Information Model Delivery	Project Close-out
Appoint individuals to undertake the information management function	Establish the appointing party's exchange information requirements	Nominate individuals to undertake the information management function	Confirm the delivery team's BIM execution plan	Mobilize resources	Check availability of reference information and shared resources	Submit information model for lead appointed party authorization	Archive the project information model
Establish the project's information requirements	Assemble reference information and shared resources	Establish the delivery team's (pre-appointment) BIM execution plan	Establish the delivery team's detailed responsibility matrix	Mobilize information technology	Generate information	Review and authorize the information model	Compile lessons learned for future projects
Establish the project's information delivery milestones	Establish tender response requirements and evaluation criteria	Assess task team capability and capacity	Establish the lead appointed party's exchange information requirements	Test the project's information production methods and procedures	Complete quality assurance check	Submit information model for appointing party acceptance	
Establish the project's information standard	Compile invitation to tender information	Establish the delivery team's capability and capacity	Establish the task information delivery plan(s)		Review information and approve for sharing	Review and accept the information model	
Establish the project's information production methods and procedures		Establish the proposed delivery team's mobilization plan	Establish the master information delivery plan		Information model review		
Establish the project's reference information and shared resources		Establish the delivery team's risk register	Complete lead appointed party's appointment documents				
Establish the project's common data environment		Compile the delivery team's tender response	Complete appointed party's appointment documents				
Establish the project's information protocol							

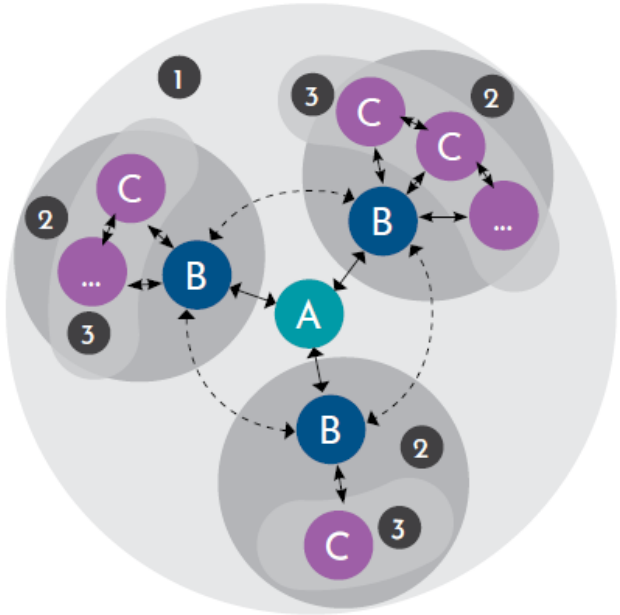


Referenced from UK BIM Framework

11 | Project Activity Mapping (ISO 19650)



12 | Information Management Functions



ISO 19650
A - Appointing Party
B – Lead Appointed Party
C – Appointed Party
1 – Project Team
2 – Delivery Team
3 – Task Team

Figure 2 - BS EN ISO 19650:2-2018, interfaces between parties and teams for the purpose of information management

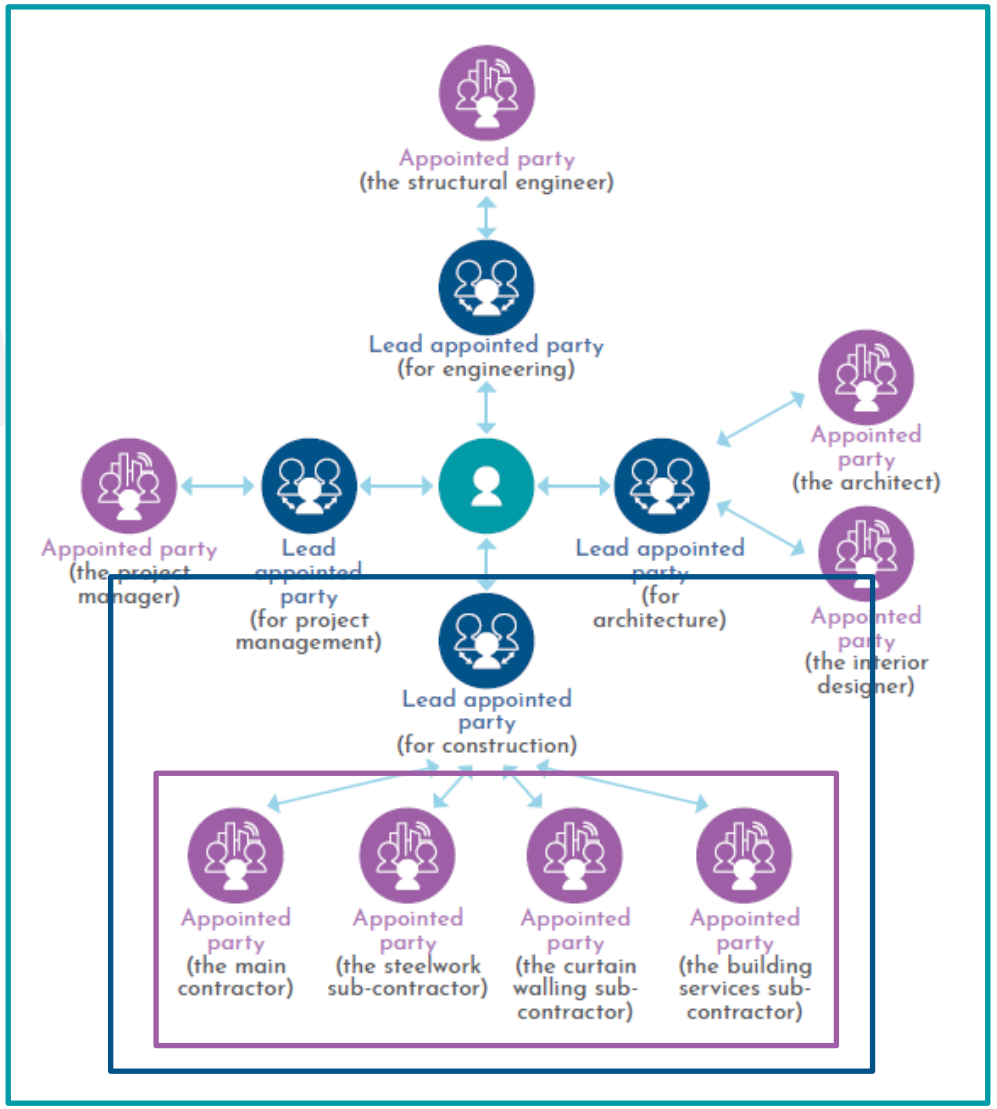
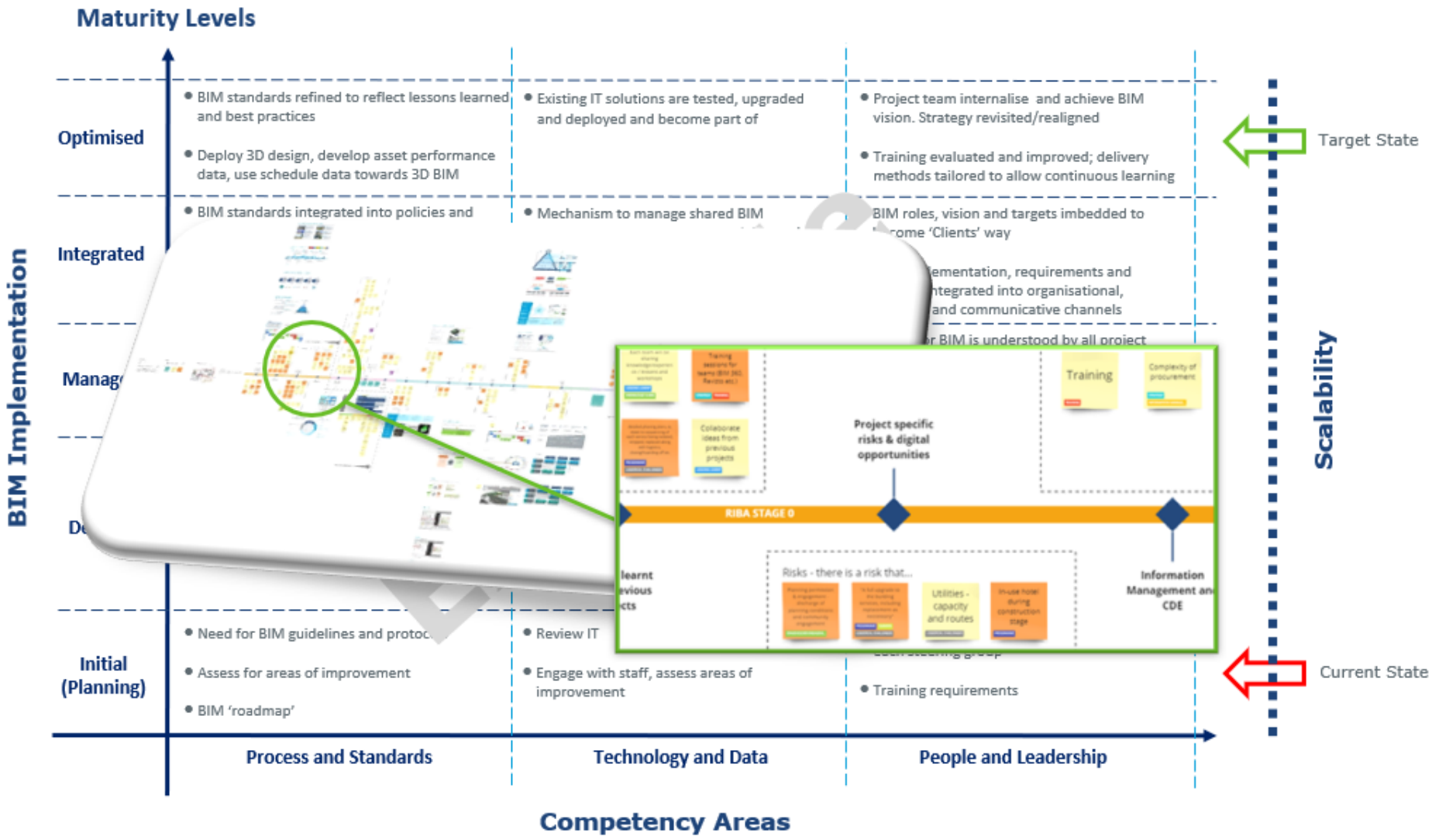
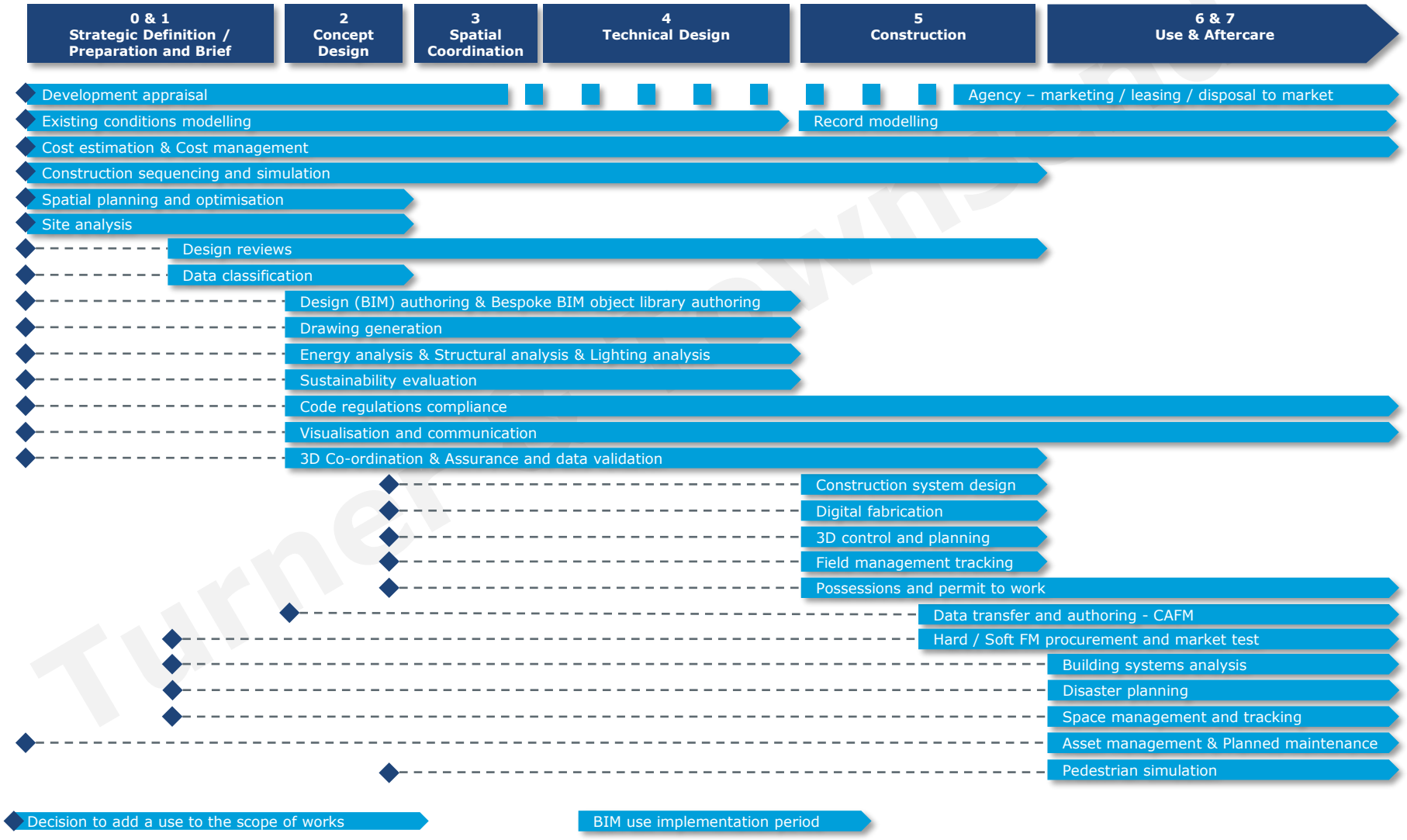


Figure 4 - Information management according to BS EN ISO 19650 Guidance Part 2 Parties, teams and processes for the delivery phase of the assets

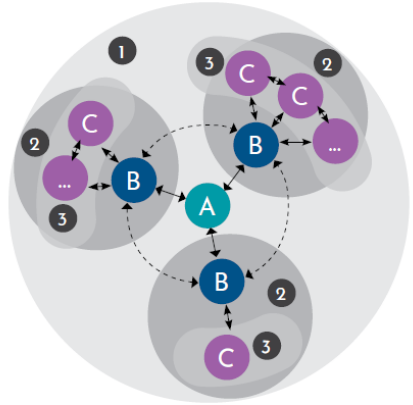
13 | Digital Strategy Workshop (0)



13 | Digital Strategy Workshop (0)



14 | Assessment and Need (1)



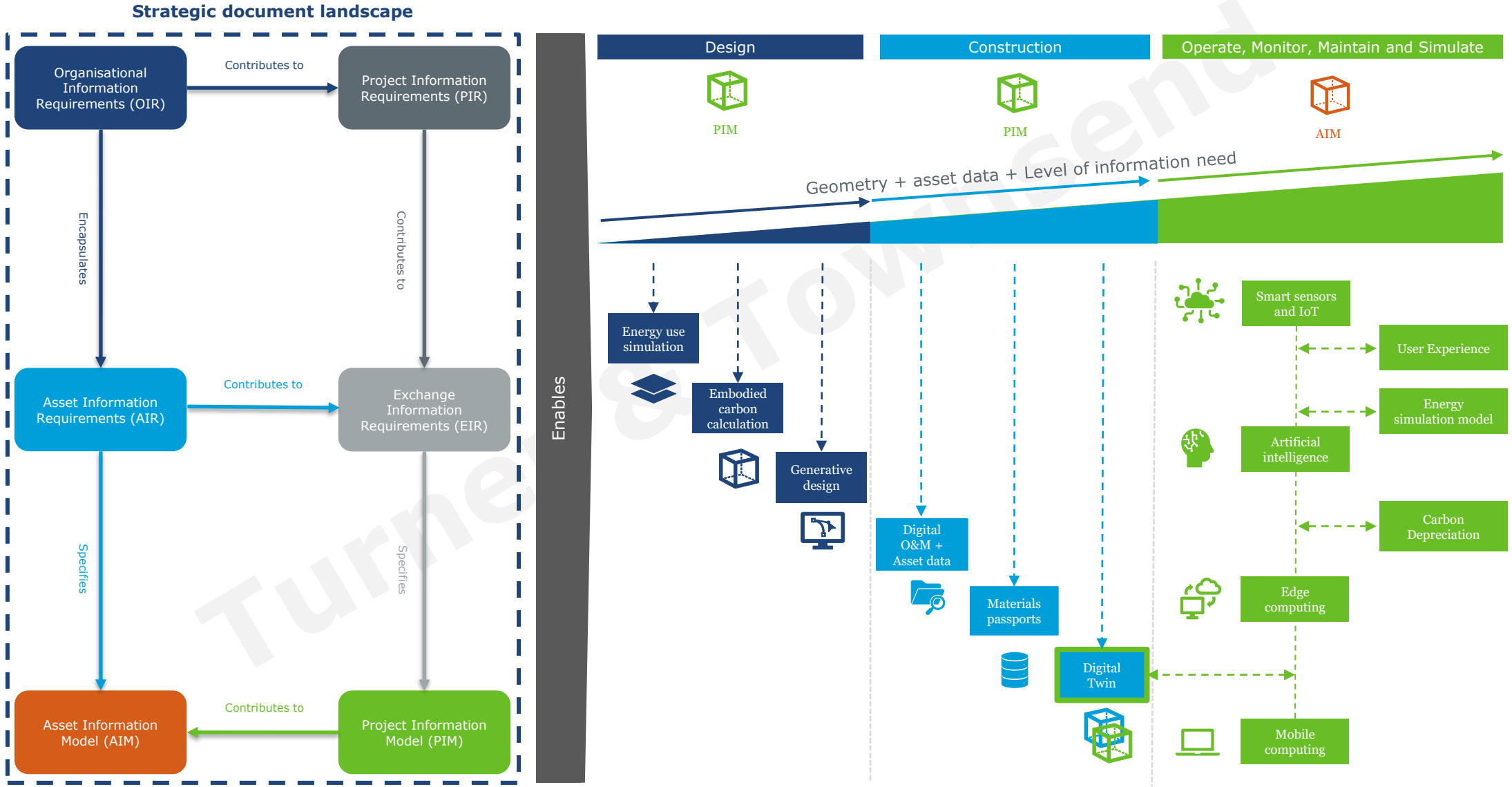
1 Assessment and need

Appoint individuals to undertake the information management function	Third Party SME
Establish the project's information requirements	Information needed by a Client to answer or inform high-level strategic objectives
Establish the project's information delivery milestones	Point at which information requires exchanging
Establish the project's information standard	Defining what information the client requires
Establish the project's information production methods and procedures	Consistency around the creation of specific information
Establish the project's reference information and shared resources	Collate any information that can be utilised by the delivery team
Establish the project's common data environment	Solution and Workflow for exchange of project information
Establish the project's information protocol	Contractual document for tender inclusion

- ✓ Thorough consideration of all operational activities
- ✓ Implementation tailored to the organisation/project
- ✓ De-risk investment in the IM/BIM process
- ✓ Outline a benchmark to work from
- ✓ Collaborative, secure environment for the exchange of project information.

- × Business change not considered
- × A strategy misaligned to client objectives
- × Duplication of resource and effort
- × Undetermined constraints around people, process and technologies
- × Uncontrolled exchange of project information between project stakeholders.

14 | Assessment and Need (1)

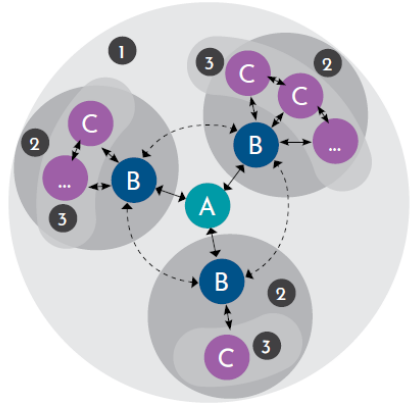


14 | Assessment and Need (1)

CDE Solution – a system or system of systems which supports the Common Data Environment Workflow processes and facilitates the exchange of information containers for varying purposes i.e. coordination, stage approvals etc.

CDE Workflow – the varying states at which information can be generated, stored and relied upon through project delivery i.e. WIP, Shared, Published and Archived

15 | Invitation to Tender (2)



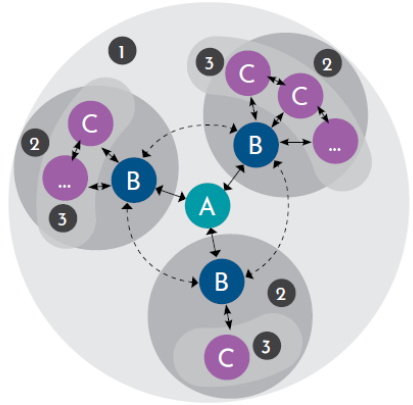
2 Invitation to Tender

Establish the appointing party's exchange information requirements	Outlines managerial, commercial and technical aspects of producing project information.
Assemble reference information and shared resources	Collation of pre-existing information for use by the delivery team
Establish tender response requirements and evaluation criteria	Define metrics for tender response requirements and evaluation criteria
Compile invitation to tender information	Collation of tender information

- ✓ Weighted criteria for assessing IM/BIM Capability
- ✓ Identify potential risk items
- ✓ Provide a clear specification for outputs
- ✓ Add value and control to projects
- ✓ Leverage benefit from IM/BIM.

- × BIM/IM requirements not articulated within the ITT
- × Functions and Responsibilities not clearly articulated
- × Incorrectly procured delivery team
- × Unconfirmed / unmeasurable progress.
- × Lack of defined direction without robust strategy.

16 | Tender Response (3)



3 Tender Response

Nominate individuals to undertake the information management function	Identify those undertaking the information management activities
Establish the delivery team's (pre-appointment) BIM execution plan	Define the pre-contract delivery playbook
Assess task team capability and capacity	Task team to compile their own responses to the assessment
Establish the delivery team's capability and capacity	Lead Appointed Party to Review prospective Task Team capability
Establish the proposed delivery team's mobilization plan	Establish the proposed delivery team's mobilization plan
Establish the delivery team's risk register	Creation of a risk register related to the timely delivery of information
Compile the delivery team's tender response	Compile the delivery team's tender response

- ✓ Clear understanding of responsibilities
- ✓ Pre-empt potential risks / capability support required to the appointed delivery team
- ✓ Identify risks to the timely delivery of information from prospective delivery teams
- ✓ Pre-defined processes for which to benchmark.

- × Supply chain are not effectively procured
- × Undefined processes leading to misinformation and varying outputs
- × Outputs not supporting key activities
- × Uncontrolled release of project information.

16 | Tender Response (3)

Extracted directly from Section 4.2, **Table 8** *(Table 8 – Optional Question Module O4: Building information modelling (BIM), policy and capability) of* ***PAS 91:2013+A1:2017***

Q1 –

Provide evidence of your organisation's capability of working with a project using a "Common Data Environment" as described in ISO 19650-2:2018?

Q2 –

Provide evidence of your organisation's documented policy, systems and procedures to achieve "BIM according to ISO 19650 series" (formerly BIM Level 2) maturity as defined in the government's BIM Strategy?

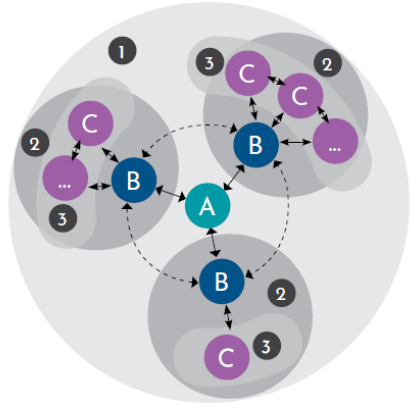
Q3 –

Provide evidence of your organisation in developing and delivering or working to (depending upon the role(s) that this PQQ covers) a BIM Execution Plan (BEP) as described in ISO19650-2:2018? Describe how this is achieved by your organisation and where available, provide a pre-contract execution plan for this purpose.

Q4 –

Do you have arrangements for training employees in BIM related skills and do you assess their capabilities? Provide an indicative organisation chart detailing the employees and relevant qualifications of those who will deliver the BIM requirements of this project.

17 | Appointment (4)



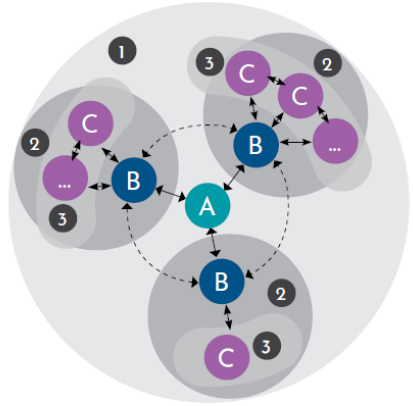
4 Appointment

Confirm the delivery team's BIM execution plan	Collate comments from wider delivery team and complete BEP
Establish the delivery team's detailed responsibility matrix	Identify the responsible party for constituent parts of the design
Establish the lead appointed party's exchange information requirements	Cascade necessary requirements to appointed parties
Establish the task information delivery plan(s)	Outline information release schedule
Establish the master information delivery plan	Establish the master information delivery plan
Complete lead appointed party's appointment documents	Complete appointment documents
Complete appointed party's appointment documents	Complete appointment documents

- ✓ Collaborative response to client requirements
- ✓ Formally administered strategy and clear accountability for design development
- ✓ Detailed delivery programme
- ✓ Confidence all appointed parties have been procured in line with the client requirements.

- × Uncontrolled release project of information
- × Potential inefficiencies in production of information (design responsibility)
- × Sufficient processes not deployed to enable successful outcomes
- × Information not produced and exchanged consistently.

18 | Mobilization (5)



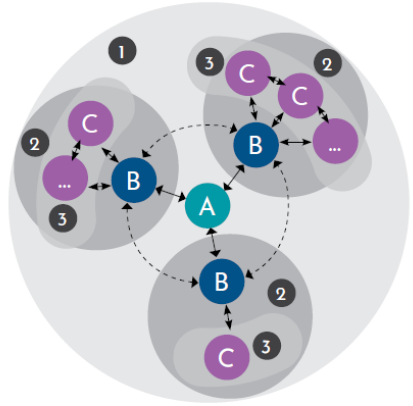
5 Mobilization

Mobilize resources	Delivery team suitably trained with technology and processes
Mobilize information technology	Hardware and software installed and tested
Test the project's information production methods and procedures	Delivery team verify the suitability of the processes for producing information

- ✓ Delivery team mobilised effectively
- ✓ IT Infrastructure to support the project
- ✓ Mitigate risk in information production through earlier identification of process constraints.

- × Incompatible software solutions
- × Unusable information models for downstream stakeholders
- × Constrained processes that do not enable effective collaboration between all stakeholders.

19 | Collaborative Production of Information (6)



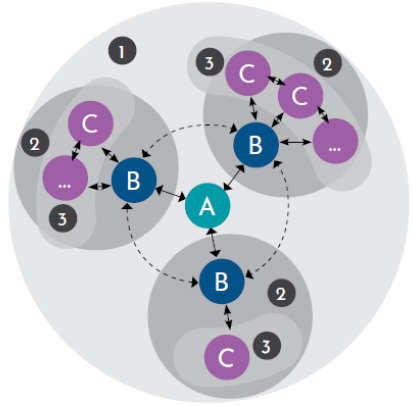
6 Collaborative Production of Information

Check availability of reference information and shared resources	Review supplementary information available to be used in production of information
Generate information	Create information model
Complete quality assurance check	Verify own information against requirements prior to release
Review information and approve for sharing	Review information and approve for sharing
Information model review	Collective review by Delivery Team

- ✓ Formally administered strategy
- ✓ Detailed delivery programme
- ✓ Unified project plan to track and monitor progress
- ✓ Greater cost certainty
- ✓ Increased programme performance
- ✓ Identify, manage and overcome challenges
- ✓ Maintain focus on client outcomes.

- × Siloed working resulting in productivity inefficiencies
- × Lack of project collaboration between the delivery team
- × Incomplete information released to Client – programme implications
- × Lack of quality in outputs
- × Supply chain do not make effective use of IM/BIM i.e. design co ordination, asset requirements, stakeholder engagement etc.

20 | Information Model Delivery (7)



7 Information Model Delivery

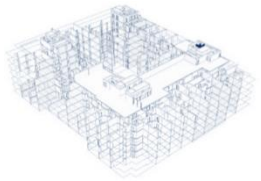
Submit information model for lead appointed party authorization	Submit information model for lead appointed party authorization
Review and authorize the information model	Review appointed parties information prior to release to the Client
Submit information model for appointing party acceptance	Issue information models to the Client
Review and accept the information model	Client review completeness of the information model against the requirements

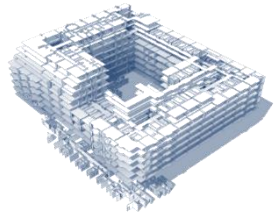
- ✓ Maximising the performance of the asset
- ✓ Focus on the transfer of information
- ✓ Operational ready information
- ✓ Management and control of milestone acceptance.

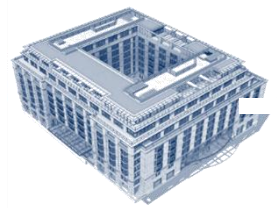
- × The Information Models produced during the delivery phase are not suitable for use by the facilities management team
- × Unsuitable/unusable data population
- × Data outputs can not be migrated to the CAFM system
- × Handover delay.

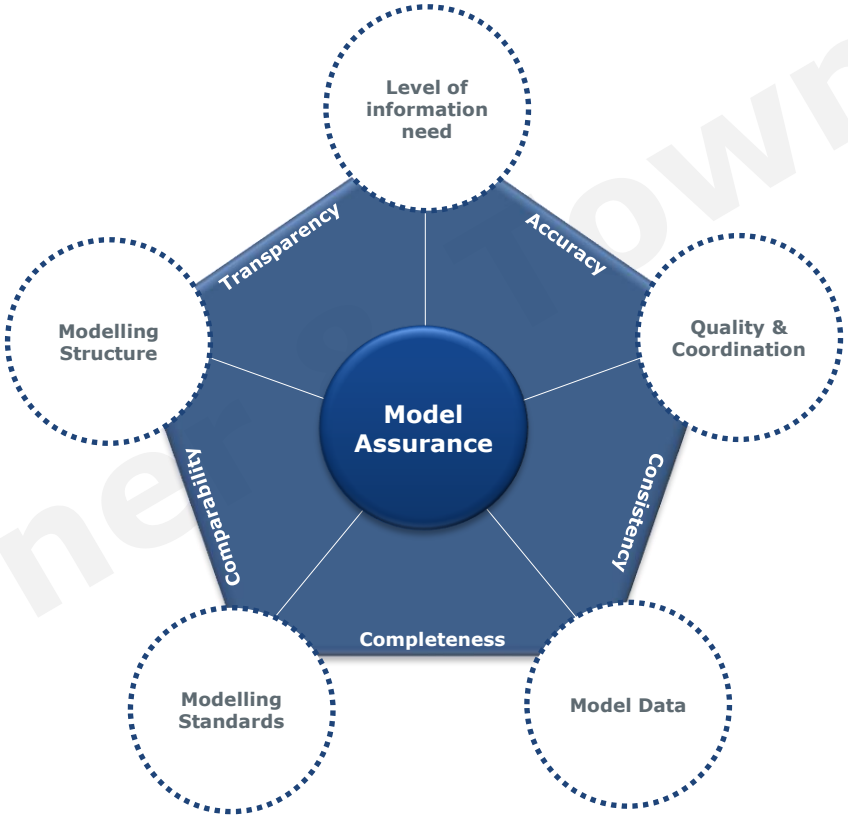
20 | Information Model Delivery (7)

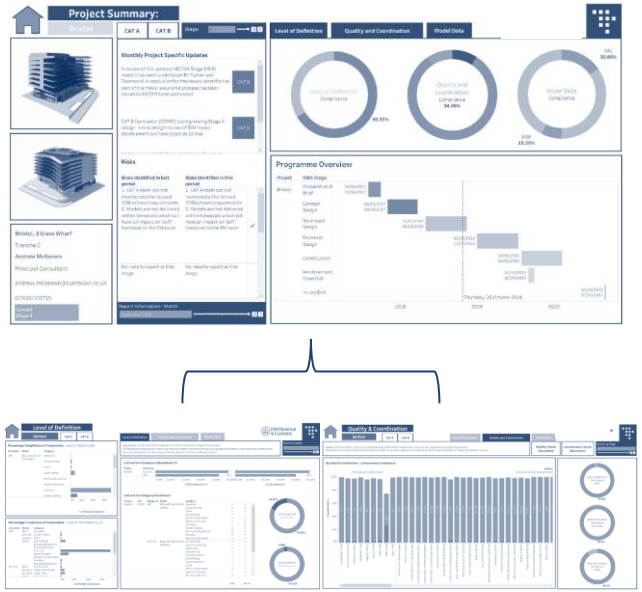
Review and accept the information model



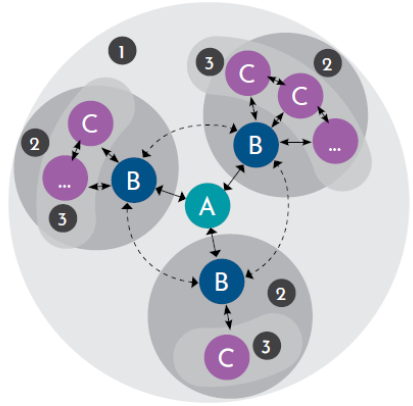








21 | Project Close-out (8)



8 Project Close-out

- Archive the project information model
- Compile lessons learned for future projects

- Archive the project information model
- Consider lessons learnt throughout project delivery, cascade down from Organisation

- ✓ Continuous improvement
- ✓ Historical information available for future works
- ✓ Refined process
- ✓ Understand successes of the project and targeted outcomes moving foward.

- × Carrying risks/challenges into future projects
- × Losing value in the process
- × Project / Programme / Organisational impacts through loss of efficiency.

IM/BIM

Summary

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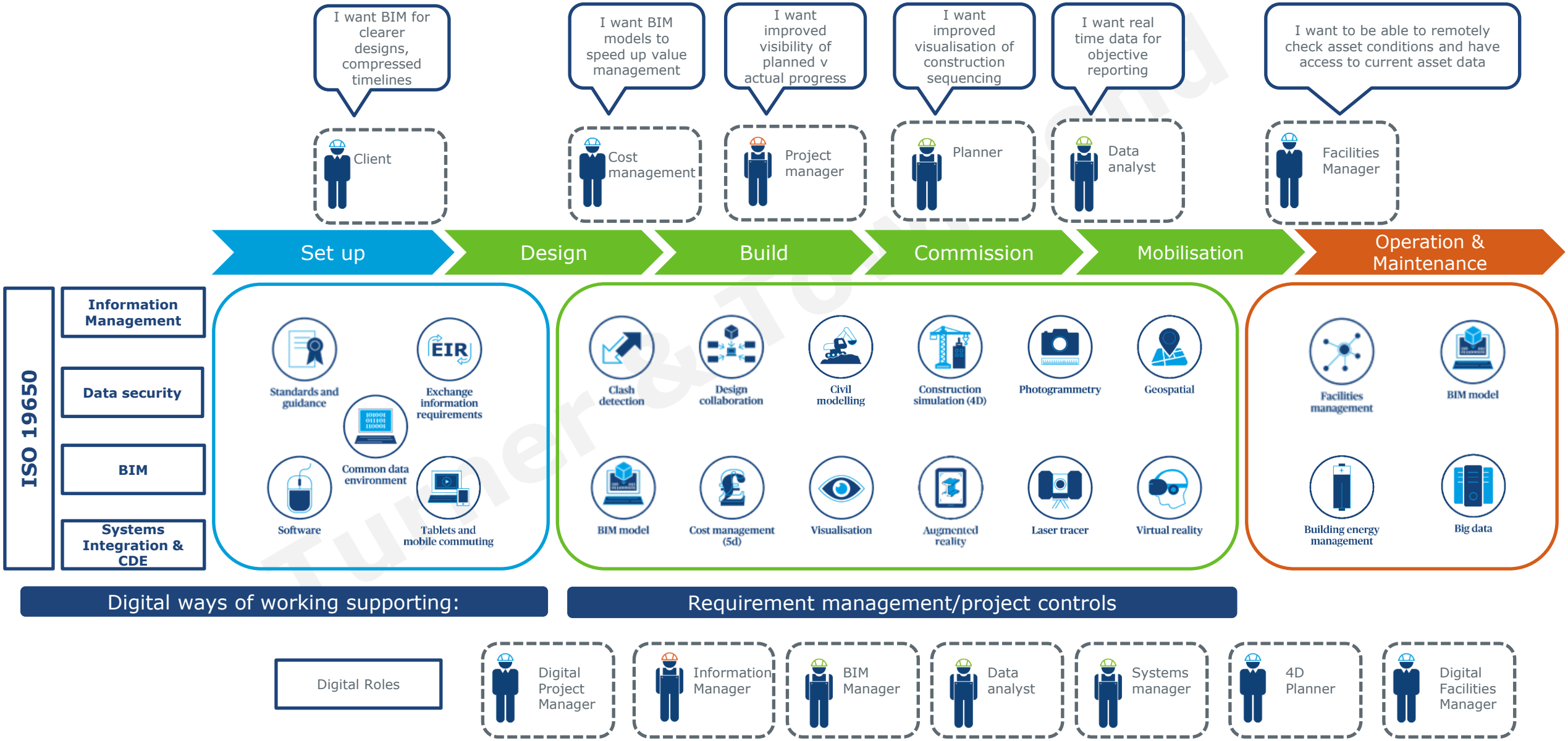
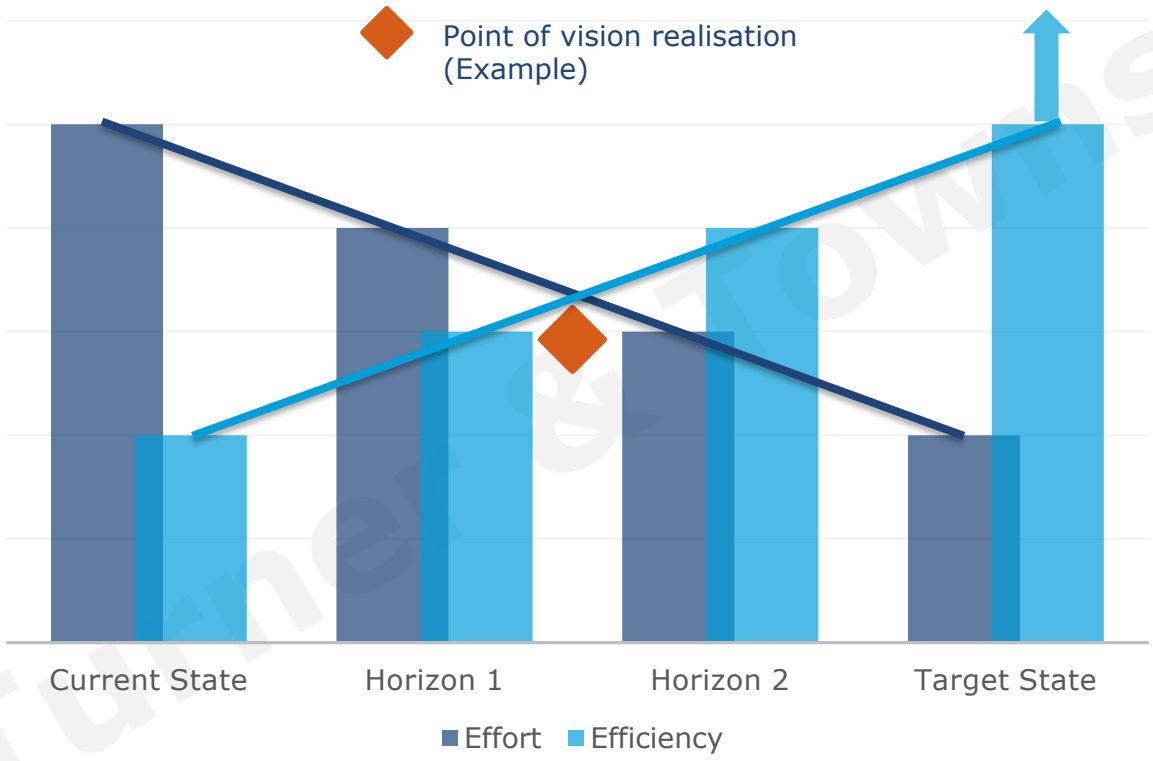
22 | Setting the Digital Focus



23 | Vision Realisation



Minimum effort, maximum gain

Current State

- 'Retrospective' appointment
- Understand the programme
- Limited visibility
- Limited control

Horizon 1

- Develop strategy
- More efficient
- Implemented strategy
- Controlled project
- Identify blockers

Horizon 2

- Lean
- Predicting outcomes
- Integrated reporting
- Overhead reduction

Target State

- Continuous improvement
- Predicting outcomes
- Integrated reporting

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