A Route Map to help public bodies improve their specification maturity

Version 0.7

Platform Digital Working Group

Prepared for the Construction Innovation Hub by Mace

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About the Construction Innovation Hub

The Construction Innovation Hub brings together world-class expertise from the Manufacturing Technology Centre (MTC), BRE and the Centre for Digital Built Britain (CDBB) to transform the UK construction industry.

With £72 million from UK Research and Innovation's Industrial Strategy Challenge Fund, and working around the four core themes of Value, Manufacturing, Assurance and Digital, we are changing the way buildings and infrastructure are designed, manufactured, integrated and connected within our built environment.

We are a catalyst for change. We are driving collaboration to develop, commercialise and promote digital and manufacturing technologies for the construction sector. We are helping build smarter, greener and more efficient buildings much faster and cheaper than we currently do.

Research is helping us understand how the industry needs to change in terms of skills, product standards, capacity and innovation. This is combined with an academic programme to create the security-minded frameworks and rules that will underpin the future digital built environment and grow exports for UK know-how.

We are working closely with other initiatives as part of the Government's Transforming Construction challenge programme. Through collaboration across the sector, we can provide a better-built environment for future generations.

Further information

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Executive summary

With £650bn of investment in infrastructure planned for the next decade[1], high quality, sustainable, and resilient infrastructure is high on the UK Government's agenda. Two recent government reports – *The Construction Playbook*[2] and *Transforming Infrastructure Performance: Roadmap to 2030*[3] – have laid out how a step change in productivity and efficiency is needed in the way we plan, design, manufacture, construct and operate infrastructure.

To help achieve these goals, they recommend harmonising, digitalising, and rationalising[4] technical requirements and processes across the board. This way, a more accessible, joined up and simple approach can be created that delivers greater efficiency and value across social infrastructure.

In this report, the Construction Innovation Hub helps address this opportunity by creating and road-testing a Framework for departments to benchmark where their technical specifications are now, then laying out an achievable and clear Route Map to improvement.

Each government department has a unique approach for managing their estate, understandably due to their respective specialisms. However, many of these processes and methodologies have been developed in isolation from other departments, resulting in a diversity of approaches unique to each department's needs. With so much potential commonality between public sector bodies, the Hub's Defining the Need report identified a huge opportunity to create consistency across departments and generate better quality, greater efficiency, and better value for the taxpayer through improved client specifications. It is currently difficult to compare the specifications of different departments.

Therefore, the Hub has developed a robust set of 'what good looks like' criteria, then set about creating a standardised, consistent Framework to help baseline, benchmark and evaluate the maturity of each department's construction specifications. This Framework will help government bodies to:

- effectively assess the maturity of their specifications against best practice;
- easily identify how to reach the next level of maturity; and
- create a practical action plan for improvement.

This report also lays out a clear, step-by-step Route Map to help departments improve, with tips and recommendations across several areas. By following this guidance, departments (and private sector clients) can get a head start on meeting government mandates and deliver a service that is better quality, higher efficiency, has appropriate security built in and offers enhanced value for money.

1 Infrastructure and Projects Authority (2021) National Infrastructure and Construction Pipeline 2021
2 Cabinet Office (2020) The Construction Playbook
3 Infrastructure and Projects Authority (2021) Transforming Infrastructure Performance: Roadmap to 2030
4 The Construction Playbook uses the terms 'harmonise, digitise and rationalise' in reference to standardising and aggregating demand through the development and adoption of shared requirements and common standards across government. While creating the specification maturity framework, the Hub recognised the value in making the distinction between "digitisation" (the digital transformation of an object) and "digitalisation" (the digital transformation of a process, often using digitised data) (See footnote 13). This report therefore prefers 'harmonise, digitalise, rationalise', which is reflected in Transforming Infrastructure Performance: Roadmap to 2030.

1. Background

Across Government, departments each have their own specialist procurement approaches, teams, terminology and culture when it comes to infrastructure. With so much commonality between public sector departments, there's a huge (and currently missed) opportunity to create consistency across departments and generate better quality, greater efficiency, and better value for the taxpayer through improved client specifications.

High quality, sustainable, and resilient infrastructure is high on the UK Government's agenda. With £650bn of investment in infrastructure planned for the next decade[5], government bodies must think robustly about how they're translating intended outcomes into delivery. They must rewire their decision making and appropriate processes to embed respect for nature, better data sharing, greater safety and security for our society and a more effective long-term partnership with the private and voluntary sectors. Industry partners also need to bring innovative solutions that accelerate progress, improve performance and invest in the future. It's a huge challenge.

Two recent government reports – the Government's 2020 *The Construction Playbook*[6] and *Transforming Infrastructure Performance: Roadmap to 2030*[7] have set the direction. They lay out how a step change in productivity and efficiency is needed in the way we plan, design, manufacture, construct and operate infrastructure. A holistic approach is required, with data from all parts of the system informing decision making – from improved information management to the creation of digital twins for asset maintenance and optimisation.

To help achieve these goals, *The Construction Playbook* recommends *'the development and use of consistent structure, rules and language in standards and specifications to facilitate shared understanding and the use of digital and automated solutions'*. By standardising requirements, specifications and standards, government can improve assets, spaces and components across departments – thereby creating a more accessible and joined up approach that delivers greater efficiency and value across social infrastructure.

There's currently a long way to go. For example, the 2020 *Defining the Need report*[8] found that most departmental specifications are open to interpretation and naming conventions are not standardised, e.g. there are 104 different ways for naming toilet spaces across five departments! Bearing in mind that 50% of government spaces are not department-specific, it means there's a huge opportunity for improvement.

However, at the moment it is difficult to set benchmarks and compare the specifications of different departments. Therefore, the first step to achieving government-mandated standards is to have a **standardised, consistent Framework to help us baseline, benchmark and evaluate the maturity** of each department's construction specifications.

5 Infrastructure and Projects Authority (2021) National Infrastructure and Construction Pipeline 2021
6 Cabinet Office (2020) The Construction Playbook
7 Infrastructure and Projects Authority (2021) Transforming Infrastructure Performance: Roadmap to 2030
8 Construction Innovation Hub (2020) Defining the Need

2. Creating the Framework

To help achieve the government's transformational targets of harmonising, digitalising and rationalising specifications and requirements, the Hub have created a tool for evaluating the status quo across departments and identifying steps to improvement.

Working with 14 organisations from across the industry, including the British Standards Institution (BSI), the Hub created a set of criteria which **defined best practice** for specification content, processes, and management. This provided a tangible vision of what good looks like across key skills, processes, and technology.

An initial assessment of government department specifications against the 'what good looks like' criteria was then carried out. This identified strengths, opportunities, gaps, and similarities across departments – which was useful but limited, and it was determined that a **more robust and granular Framework** would be needed for more in-depth assessments. This would need to be a **Framework which had clear definitions for levels of maturity, and which decoupled digitalisation and standardisation of specifications**. Research indicated it is best to keep the two separate, as it is important to establish a good level of standardisation before embarking on digitalisation to avoid embedding incorrect content, processes, and behaviours. However, as digitalisation helps with standardising and improving maturity, some elements will need to run in parallel. For example, digitally-enabled referencing will be supported by mapping requirements to a common classification system within a content management system (CMS).

The assessment Framework below was created to help government bodies to: effectively assess the maturity of their specifications against best practice; easily identify how to reach the next level of maturity; and create a practical action plan for improvement. Using the first assessment as a baseline, departments can then use the model at regular intervals to check progress. The model is summarised in the diagram below. It:

- applies learnings from both industry-recognised maturity models and the 'what good looks like' criteria
- has been rigorously tested with industry and refined through multiple iterations; and
- measures twenty standardisation areas and six digitalisation areas against five maturity levels.

	Level 1	Level 2	Level 3	Level 4	Level 5
Standardisation	Initial	Organised	Functional	Managed by Department	Optimised across Government
Digitalisation	Analogue (paper-based)	Digitised (file-based)	Data-based	Model-based	Knowledge-based

Each maturity level has clearly defined characteristics to help departments assess their position against the five-level scale:

- standardisation levels are predominantly based on the maturity levels of the Capability Maturity Model Integration (CMMI)[9] used in systems engineering for aviation, manufacturing and software.
- digitalisation levels are derived from the BIMe Initiative BIM Maturity Index[10] and work on the digitalisation of UK BIM Framework Guidance shared by CDBB and Mott MacDonald[11].

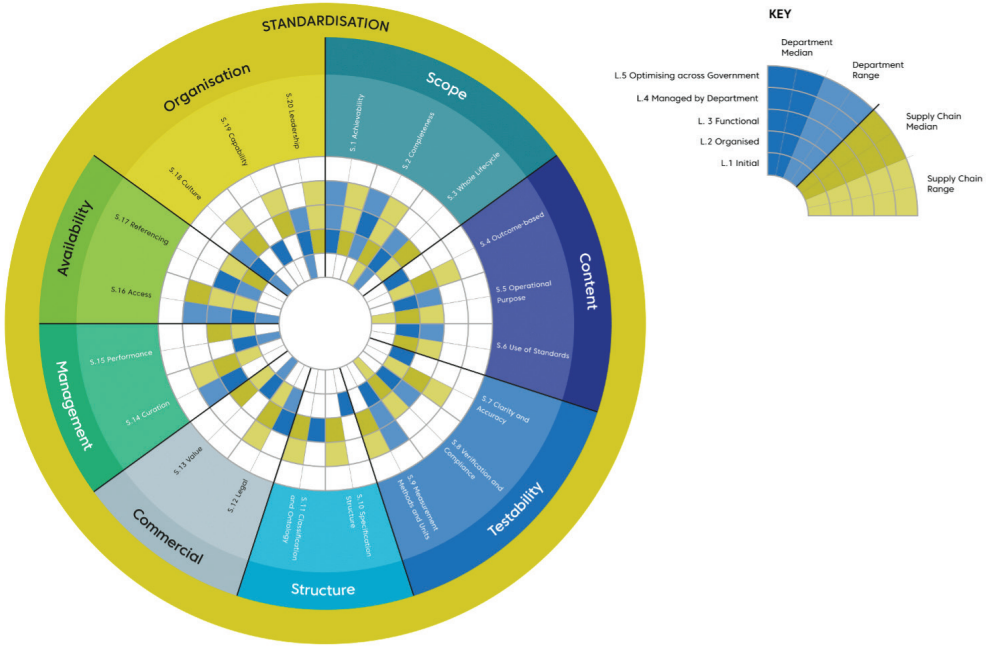
9 CMMI Institute (2018) CMMI Levels of Capability and Performance
10 BIM Excellence (2016) 301in BIM Maturity Matrix
11 Centre for Digital Built Britain (2021) An evaluation of the potential for digitalisation of the UK BIM Framework to increase industry adoption

3. Using the Framework

The next step was to use the Framework in the real world. The Hub supported client partner departments and industry partners to assess where they were against best practice using the evaluation tool.

Between May and November 2021, 58 experts from 19 organisations were invited to assess the maturity of government departments' technical specifications. The Hub facilitated workshops with departments and their supply chains to gain a full picture, including:

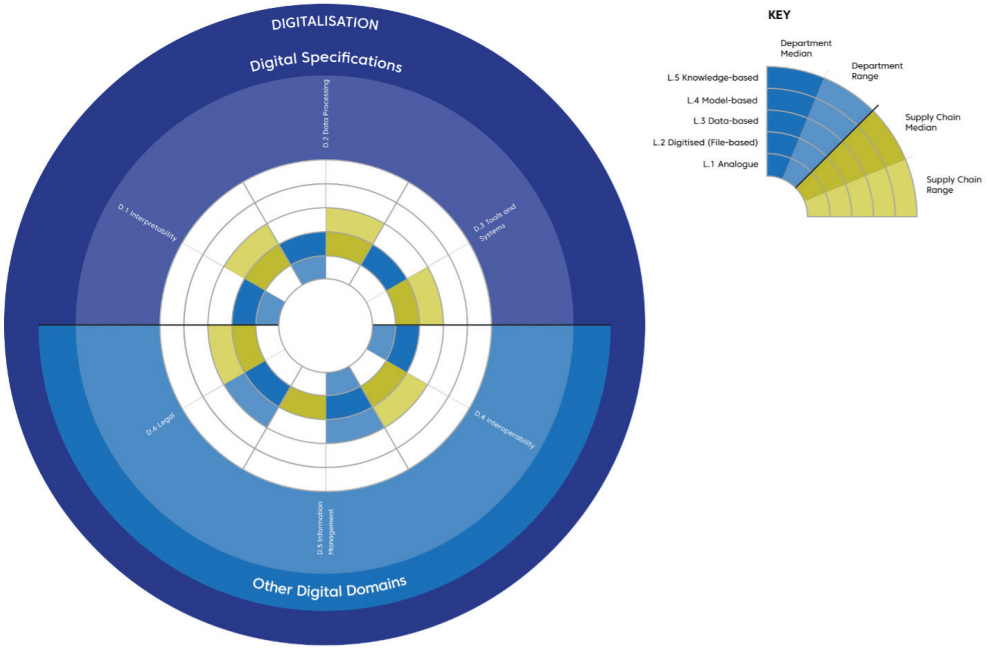
- self-assessment of the departments' current and desired levels of maturity, and any barriers/enablers.
- the supply chains' view of each departments' specifications, to gain the external perspective on their ease of use and the level of industry engagement.



The departments noted at the time that a lot could be learned from the exercise – see the roundels above for the range of assessed scores. Whilst there was a clear variance between departments in their levels of maturity, some themes emerged:

- Specifications currently can be difficult for users to understand, and time-consuming for departments to verify.
- Outcome-based specifications can be too subject to interpretation, but overly prescriptive specifications constrain innovation and can introduce conflicting requirements. A balance must be found.
- Lessons and data should be systematically captured throughout project/asset lifecycles to feed into specification updates and drive continuous improvement.
- Understanding what has worked well on previous projects is key to making changes to delivery.
- Digital solutions can be transformative but need investment and specialist skills to achieve the desired outcomes at the required speed.
- Departments also need to consider the evolving social, environmental and technological context and the impact on their estate.
- For units, measurement methods, ontology, classification system, structure of documents and the management of specifications, a common approach should be agreed across Government to create common standards and approaches, which will support the harmonisation and rationalisation of demand. This should build on the UK BIM Framework.
- the Hub through the Platform Programme, have the potential to improve the inconsistent quality of infrastructure and deliver outcomes beyond the constraints of individual projects and portfolios.

The insights gained during the workshops identified key interventions which would address learnings and barriers. These could be mapped to create a Route Map to help departments improve their specification maturity and be better placed to achieve the government mandates set out in *The Construction Playbook* and *Transforming Infrastructure Performance: Roadmap to 2030.*



4. A Route Map to improvement

The assessment identified the departments' current level of maturity against best practice across the 26 areas. Now there is a need to lay out a path to improvement. The Route Map was consequently created to support departments to structure the journey to greater specification maturity.

Making blanket recommendations for improvement is not easy, since each department is at a different stage of maturity and capability sets are interwoven and complex. A smaller number of focused interventions were identified which can improve maturity across the board.

As mentioned above, it is recommended to standardise before digitalising to prevent embedding any incorrect processes, behaviours or content. (Whilst acknowledging that in some areas, the two will need to happen in parallel.)

With this in mind, the Route Map is structured in three key improvement phases 6:

1. **Harmonise**: activities to help the adoption of standard content, processes and behaviours
2. **Digitalise**: activities to enable the adoption of digital tools and ways of working for specifications
3. **Rationalise**: activities to encourage continuous improvement through both standardisation and digitalisation

Across the three phases, there are four key areas to map the interventions:

- **Content** – improving the subject matter, wording and detail of specifications
- **Infrastructure** – improving the organisation and systems of specifications
- **Process** – improving specifications' use and application
- **Culture** – improving behaviours and ways of working

In reality, the phases are not so sharply defined. This Route Map, shown below, is intended to be guidance which gives departments structured recommendations for adoption. The departments are best placed to understand their business and operations, so can adapt these guidelines to best meet their organisational needs.

Specification Maturity Interactive Route Map[12]

Click on the milestones to read more. The logo resets the page.

Activity Title

Staff attitudes to specifications

Activity Headline

Departmental staff should recognise the importance of improving specifications in line with standardisation and digitalisation initiatives

Activity Description

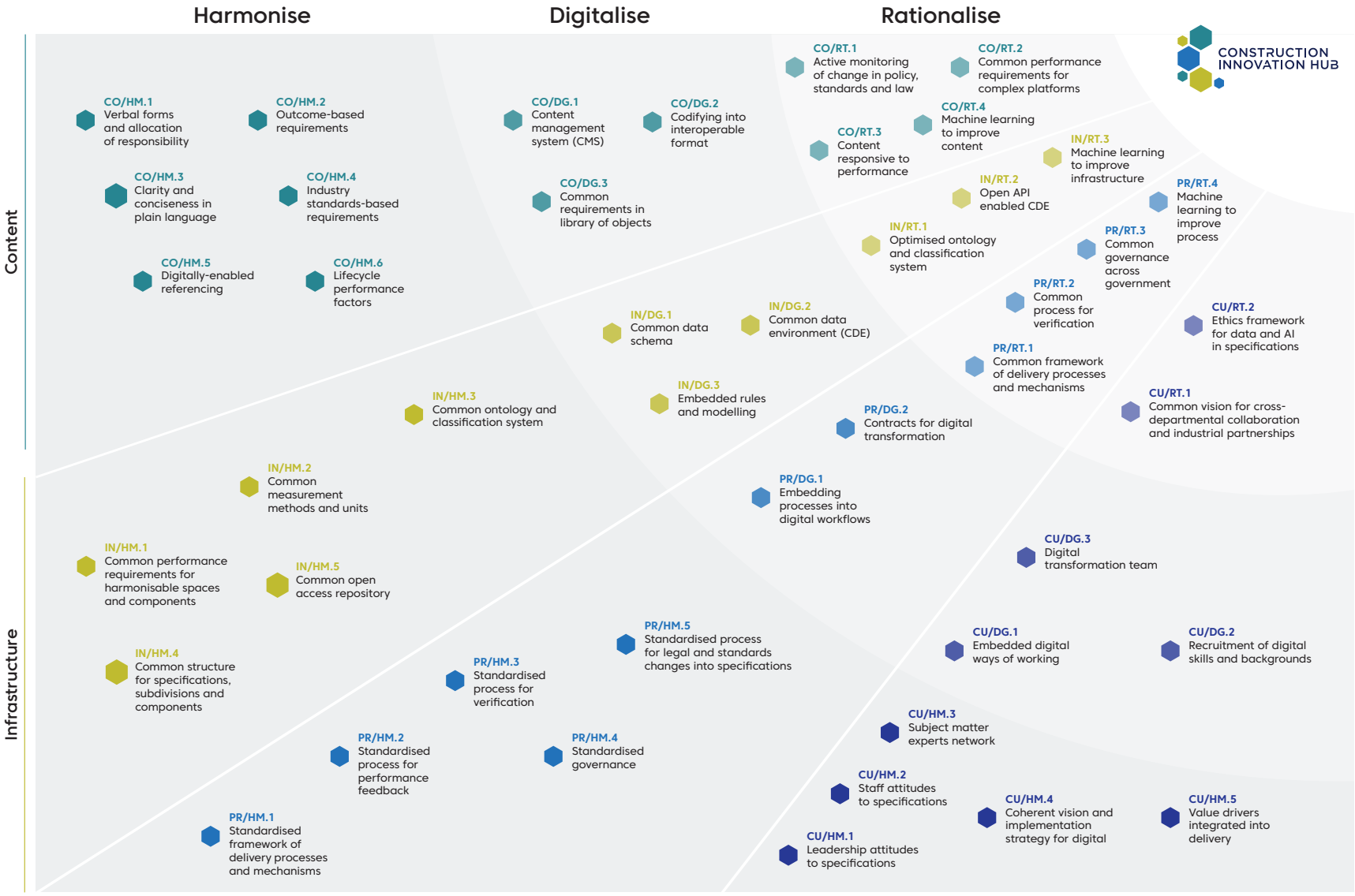
Departmental staff should be actively engaged with developing and testing processes for streamlining change management processes, that are enabled by digital technologies e.g. e-approvals. All relevant personnel across department understand the value and application of specifications with responsibilities diffused into each role.

Sub-activities

- Training and development on the process of continuous improvement and digitalisation, and the impact that this can have - valuable to include relevant case studies
- Inconsistencies and ambiguity across the specifications for a given department are actively identified and amended
- Specification structures are harmonised to ease access of information

Enablers

- Cabinet Office/IPA support for engagement and training of staff
- Government Functional Standards
- Government Functional Standard GovS 002: Project Delivery
- IPA Project Routemap
- Defining the Need



Content Infrastructure Process Culture

12 Construction Innovation Hub (2022) Specification Maturity Route Map

4.1 Action plan

In creating and developing the Framework and Route Map, the Hub has developed a tool which enables clients to evaluate and improve the maturity of their specifications. The recommendations below outline some clear practical steps to reach the next level of maturity, divided into short- and long-term with some other initiatives which could support the journey to better specifications.

Short-term/immediate recommendations:

- Use the Framework to benchmark current maturity against best practice
- Plot the path to a more advanced level of specification maturity using the Route Map, aligning with other departments for consistent structure, rules and language across government. (Note: this step should not contradict interventions in play, rather provide guidance on ways to complement in-flight activities).
- Periodically review progress against the Route Map every six months - recognising completed interventions and identifying next actions.

Longer-term perspective

- Focus on sharing knowledge and fostering a sense of community between departments to forge closer integration.
- Engage the wider community (e.g. BSI, IPA, HMT, CLC and those in the supply-chain ecosystem) so they are bought into the changes and will proactively support improvements.
- Harness advances in technology as and when they become available to improve optimisation.

Other helpful initiatives

A Platform Approach – harmonised and rationalised requirements enable effective platform solutions, as described in the Hub's Product Platform Development Framework[13]. They do this by providing the market with clearer requirements for products and components, helping suppliers more easily consume and translate government requirements into better, greener, faster solutions across social infrastructure.

Digital Library and Configurators[14] – a way to create and store the frameworks, definitions and (eventually) a content management system/database of requirements, specifications, and information suitable for many use cases. This digital library will help clients express their needs when commissioning consultants and transmitting their requirements for contractors. It will also provide a set of rules that help the market offer repeatable products in a machine-readable catalogue. Configuration tools can compare these rules with component data in the digital library to automate design and verify the design's compliance against client specifications/ requirements. Configurators can also provide other outputs, such as full cost breakdowns, lists of approved suppliers and whole-life calculations for carbon.

The work of the CDBB on Information Management and Digital Twins[15] – sets out clear client expectations for the supply chain to meet, but too often through lost opportunities and human error, non-compliances are not picked up during design and installation. Digital technologies will enable effective retention and management of the golden thread of building and infrastructure information, from client requirements to brief to design to contract to facility operator. This drives continuous improvement, with lessons learned and performance data providing feedback that improves requirements and increases specification maturity. By using the tools created by CDBB as part of the Construction Innovation Hub16 and supporting the development of digital twins, departments can create data-driven insights that improve decision making and highlight non-compliances so they can be rectified in the real world.

13 Construction Innovation Hub (2021) Platform Programme: The Road to the Rulebook
14 See Focus Area 3 (p.24-27) of Transforming Infrastructure Performance: Roadmap to 2030 for more information.
15 Centre for Digital Built Britain (2018) National Digital Twin Programme
16 Centre for Digital Built Britain (2018) Information Management Framework

Appendices

Appendix A. Specification maturity assessment guidance

The Construction Playbook recommends demand across projects and programmes should be harmonised, digitalised and rationalised to accelerate development and use of platform approaches, standard products and components. Contracting authorities are advised to support 'the development and use of consistent structure, rules and language in standards and specifications to facilitate shared understanding and the use of digital and automated solutions'.

The Construction Innovation Hub has worked with government departments and industry to develop a Specification Maturity Framework (Appendix B) which enables contracting authorities to measure and benchmark the client's estate technical specifications against best practice and support the creation of a practical action plan for improvement (see the Specification Maturity Route Map).

- The Framework has five levels of maturity from Level 1 (least mature) to Level 5 (most mature).
- There are 26 Capability Sets split across two domains of Standardisation and Digitalisation – decoupled to enable maturity improvement plan to run activities for each in parallel.
- Standardisation has 20 Capability Sets which assess the maturity of the specification material, organisation and use.
- Digitalisation has six Capability Sets which assess the maturity of the use of data, technology and digital ways of working for specifications.

The Assessment Tool is intended for low-detail self-assessment, providing a benchmark for repeated assessment and enabling the identification of an action plan for improvement. It is recommended the assessment is repeated every six months.

Preparation

- Assessments should be completed by the contracting authority and their supply chain to enable the client to gain new perspectives on the implementation of specifications through differences in scoring and insights from discussion.
- Conduct the assessment as a workshop with participants from across the department and across the supply chain (e.g. consultants, contractors, FM providers).
- Workshops are expected to take 60 to 90 minutes to complete.

Assessment

- For each Capability Set, read the Question to frame the selection of the level of maturity.
- Read the full row of definitions across all levels of maturity before selecting the level which best describes the maturity of the specifications in response to the Question and enter the score for current maturity under Current Level.
- Re-read the definitions and select the level which best describes the desired level of maturity which the department would want to achieve in future and enter under Target Level.
- Capture any comments for justification of the selections in Commentary.
- Contracting authorities often have a suite of specifications across different typologies and disciplines - participants should agree the level of maturity with the definition which best describes the prevailing maturity across the suite of specifications in use. (A more in-depth evaluation using the Assessment Tool may evaluate each specification individually, though some Capability Sets may be not applicable.)

Analysis

- Do not calculate total or average scores for columns as these are misleading.
- Departments and the supply chain are likely to have different perspectives for some Capability Sets. Follow up workshops should be arranged to discuss any differences and the reasons for any variance in perspective. Comments should be captured and evaluated with the commentary from both Assessment sheets
- Discuss the results to identify areas and actions for improvement. The Specification Maturity Route Map can provide some guidance and structure for development of an action plan.

Appendix B. Specification maturity framework assessment

SPECIFICATION MATURITY FRAMEWORK ASSESSMENT **[Department Name]**

Date	[Date]	**Participants**	[Participant Name, Role]

STANDARDISATION										
Code	Capability Set	Question	Level 1 Initial	Level 2 Organised	Level 3 Functional	Level 4 Managed by Department	Level 5 Optimising across Government	Current Level	Target Level	Commentary
Scope										
S.1	Achievability	How achievable and realistic are your requirements?	Requirements often not realistic (e.g. demands on the supply chain, conflicts between requirements across specifications)	Clarification often needed through derogation process to resolve conflicts between requirements	Governance in place to capture derogations and improve achievability of requirements	Department regularly monitors and reviews social, environmental and market context alongside established derogation processes to update requirements for achievability	Common requirements across government are continuously reviewed and updated to proactively adapt to changing context, with input from ecosystem of supply chain partners			
S.2	Completeness	Are your specifications complete within their stated purpose and scope?	Purpose and scope often unclear, may omit or overly generalise requirements and lack completeness.	Stated purpose and defined scope but clarification often needed to confirm detail	Stated purpose and a clearly defined scope, but some lack of detail can result in inefficiencies	Department has clearly defined the purpose and scope for each specification, complete in covering the requirements to a high level of detail	Consistent review of specifications for agreed purpose and defined scope across government for shared specifications, complete to a high level of granularity			
S.3	Whole Lifecycle	How do your requirements consider the whole asset lifecycle?	Requirements only consider the immediate function and operation of a built asset	The function of a built asset is considered by requirements across its lifespan in use to allow for flexibility of activity	Requirements consider performance factors (e.g. function, cost, carbon, health & safety) across the asset lifespan, process for collection and analysis not clearly set out and applied to every project	Department collects and analyses data on application of requirements which take into account performance factors across the asset lifespan	Whole lifecycle of the asset is considered by requirements for performance factors agreed across government, continuous reviews to maintain focus on optimal use of resources and circular economy			
Content			**Level 1 - Initial**	**Level 2 - Organised**	**Level 3 - Functional**	**Level 4 - Managed by Department**	**Level 5 - Optimising across Government**			
S.4	Outcome Based	How are your requirements expressed?	Highly descriptive and prescriptive in specifying the scope of assets, limiting opportunities for innovation.	Flexibility for innovation is integrated into specifications, often requires derogation to overcome restrictive requirements	Performance-based requirements, some descriptive requirements are retained to maintain control of solutions. Outcome-based requirements are too open to interpretation.	Performance-based requirements focus on department-specified outcomes with a framework of processes and mechanisms to maintain control of supply chain outputs. Innovations are captured and requirements are updated regularly	Common requirements cross-government are expressed in performance and outcomes, with innovations and best practice continuously integrated into improved specifications through the data captured on the application of requirements			
S.5	Operational Purpose	How do you capture operational purpose within your requirements?	Operational relevance of requirements is unclear or ambiguous	Operational justification is given within the requirement.	Requirements have a clear operational purpose with reference to departmental operational documents	References to departmental operational documents within specification to provide requirements with purpose, with processes in place to maintain referencing links	Government and departmental policies and documents are digitally referenced for requirements to capture purpose, with processes agreed and reviewed to keep references up-to-date and relevant			
S.6	Use of Standards	How do you use national and international standards to develop your requirements?	National or international standards directly cited as requirements without reference to relevant parts or sections	Specific reference to parts, sections and clauses of standards frequently cited directly as requirements	Standards used to establish requirements with relevant referencing, sections of standards are sometimes cited directly for some technical requirements	Departmental requirements are developed using standards, with references to the relevant standards and processes in place to review requirements when standards are reviewed	Departments agree relevant standards to establish shared requirements with processes to continuously consider relevance of standards and update digitally-enabled references			
Testability			**Level 1 - Initial**	**Level 2 - Organised**	**Level 3 - Functional**	**Level 4 - Managed by Department**	**Level 5 - Optimising across Government**			
S.7	Clarity and Accuracy	Are your requirements clear, concise, unambiguous and accurate using plain language?	Requirements lack accuracy and clarity, with highly technical language used throughout without definitions for terminology and acronyms	Clarity and accuracy in definition of requirements, but often not concise. Definitions are provided, but technical language used throughout	Clear and accurate with supplementary information occasionally given which introduces some ambiguity, verbal forms (shall, should, may, etc.) and technical language clearly defined where used	Clear, concise and accurate in plain language with exception of technical detail where terminology is defined and appropriate to the department-specific audience	Cross-government agreement on rules for clarity, accuracy and conciseness expressed in plain language with exception of technical language appropriate to a cross-government audience, which is continuously reviewed and improved			
S.8	Verification and Compliance	How do you verify requirements and enable users to claim compliance and conformity with specifications?	Verification is subjective, with no process defined for verification or compliance and no allocation of responsibility	Verification process in place but responsibilities and timings unclear, so compliance and conformity are difficult to claim	Objectively verifiable through defined process with allocated responsibilities and identified relevant lifecycle stage, enabling users to claim conformance and compliance against most requirements	Clear process in place for objective verification with responsibilities clearly identified for named roles at the relevant time and acceptance criteria with data shared across department	Processes for objective verification and compliance/conformance agreed across government with identified responsibilities and acceptance criteria at the relevant lifecycle stage, continuously reviewed and improved using data from each department			
S.9	Measurement Methods and Units	How do you specify your measurement methods and units?	Measurement methods and units specific to specification without clear definition	Consistent measurement methods and units are defined for each specification, but are not consistent across all specifications	Defined measurement methods and units for consistent use across department, though there are some discrepancies for complex disciplines (such as acoustics or lighting)	Agreed consistent units and measurement methods across the department specifications which are regularly reviewed when required	Measurement methods and units are agreed across government with shared responsibility for monitoring and updating in accordance with best practice, which is disseminated directly to each shared specification and the measurement methods and units specified by the scope			
Structure			**Level 1 - Initial**	**Level 2 - Organised**	**Level 3 - Functional**	**Level 4 - Managed by Department**	**Level 5 - Optimising across Government**			
S.10	Specification Structure	How do you structure the content, subdivisions and components of your specifications?	Author of each specification defines their own structure for the order of requirements, document subdivision and component formats.	Basic structure is identified for the content and subdivision of specifications, with limited consistency across the department.	Content is arranged according to a defined structure (e.g. typology, lifecycle stage) with an order and format for specifications' subdivisions and components with some limited flexibility for expansion.	Department has clear guidance on the structure and format of specifications which enable flexibility for expansion and modification within a defined and controlled framework.	An agreed framework for the structure and format of specification content, subdivision and components is implemented across government, with constant evaluation to reflect best practice and lessons from use.			

S.11	Classification and Ontology	How do you define and classify your assets, processes, actors and knowledge?	Specifications do not use a classification system or standard ontology.	Classification system and ontology is department-specific and is inconsistently applied across the estate typologies.	Classification system and ontology is standardised across the estate with some use of industry-recognised terminology, but may be some variances across assets that are not aligned.	Department uses an industry-recognised classification system (e.g. Uniclass 2015) across the estate and a common ontology for all typologies. Department-specific classifications are integrated into standardised systems where needed.	A standardised classification system and common ontology is agreed across government departments and applied for all specifications. Continuous dialogue ensures the system and ontology are optimised for use with decisions based on data and lessons learned.			
Commercial			**Level 1 - Initial**	**Level 2 - Organised**	**Level 3 - Functional**	**Level 4 - Managed by Department**	**Level 5 - Optimising across Government**			
S.12	Legal	How do you align your specifications with legal and contractual arrangements?	Contractual relationship and responsibilities defined and clearly specified in specifications, limiting commercial and contractual models available for use (e.g. allocation of design responsibility to contractor). Relevant legislation for requirements not communicated (e.g. Buildings Regulations).	Responsibilities allocated to client and supply chain in requirements, limiting commercial strategies available for use. Legal obligations outlined for specifications but not clearly mapped to specific requirements.	Responsibilities allocated between client and supply chain for some requirements. Relevant legislation to requirement stated within specification.	No allocation of responsibilities for client and supply chain within specifications to enable use of different delivery models and contracting strategies. Relevant legislation to requirement clearly stated with reference to specific clauses and sections.	Requirements are continuously evaluated and improved across government for application in diversity of different delivery models and contracting strategies. Impact of change to legislation is continually reviewed to update and improve affected requirements.			
S.13	Value	How do you create and recognise value through your specifications?	Focus on maximum performance for defined outputs at minimum capital cost, but little consideration for operating activities and costs	Capital and operating activities/costs considered for defined outputs, focus on minimising costs	Specifications consider long-term value through both capital and operating activities and costs, with links to organisational outcomes	Clear links to organisational outcomes with consideration for maximising social value and performance at value for money across the asset lifecycle	Clear links to societal outcomes across government and wider society, with value creation and measurement identified and captured across the asset lifecycle for continuous improvement			
Management			**Level 1 - Initial**	**Level 2 - Organised**	**Level 3 - Functional**	**Level 4 - Managed by Department**	**Level 5 - Optimising across Government**			
S.14	Curation	How do you allocate responsibility and agree procedures for the development, publication and management of your specifications?	Ownership not clearly identified with no agreed procedures for publication and management	Governance and ownership defined, specifications reviewed and updated when planned or major issues identified, but take time to reissue with basic version history	Clear ownership and consistent procedures to review and update specifications with changes from derogations and industry bodies, but time taken to action and approve	Ownership and procedures agreed and regularly reviewed by department, with data from application captured to inform updates	Ownership and procedures across government agreed and continually reviewed for improvements, with specifications continuously reviewed and proactively refined by cross-government experts informed by ecosystem of supply chain partners			
S.15	Performance	How do you capture and evaluate data to improve your specifications?	Data not collected	Lessons learned collected inconsistently to inform improvements to specifications	Project personnel collect lessons learned and performance data consistently, though analysis to inform improvements is inconsistent	Personnel, end users and supply chain are required to capture lessons learned and performance data used to regularly improve specification content, application and management	Lessons learned and perfomance data collected across government with cross-government group analysing data to continuously improve specification content, application and management			
Availability			**Level 1 - Initial**	**Level 2 - Organised**	**Level 3 - Functional**	**Level 4 - Managed by Department**	**Level 5 - Optimising across Government**			
S.16	Access	How do users access specifications?	Specifications held by department, only released to individuals in supply chain when necessary for delivery	Specifications held in central repository by department with access process defined for authorisation of individuals	Specifications are typically open access, sensitive requirements accessed through authorisation process but often over-classified	Specifications are open access, sensitive requirements are repeatedly assessed and only accessed through authorisation process if high security risk	Specifications are open access from a government-controlled central repository, sensitive requirements assessed by departments to standard process with access continuously reviewed			
S.17	Referencing	How are references specified and accessed?	References are poorly defined or omitted	References provided in text with sources identified to documents, not specific parts	References clearly presented in text form with sources precisely identified to clauses or sections of referenced file, occasionally digitally-enabled	References clearly presented and digitally-enabled through digital object identifiers (DOIs) or URLs with precisely identified source	References up-to-date and precisely identified through digital links, continuously reviewed and improved across government			
Organisation			**Level 1 - Initial**	**Level 2 - Organised**	**Level 3 - Functional**	**Level 4 - Managed by Department**	**Level 5 - Optimising across Government**			
S.18	Culture	How are standardised specifications valued, shared and integrated into behaviours across your organisation?	Personnel not widely aware of specifications and knowledge is reactively shared between people informally	Directly affected personnel recognise value of specifications, share and use as needed specific to their role	Personnel are aware of value and application of specifications relative to their role	All relevant personnel across department understand value and application of specifications with responsibilities diffused into each role	Specifications are core part of client capability and all personnel across government understand their value and application, knowledge shared freely and proactively between departments for continuous improvement through established cross-government structures			
S.19	Capability	How well are specifications integrated into the skills and knowledge of your organisation?	Knowledge of specifications not recognised as an asset, held by a select few individuals within the organisation and shared informally	Knowledge of specifications is recognised as an asset, but only integrated into the skills and knowledge of select group of specialists with high dependency on the supply chain to digest and deliver requirements	Project personnel have working knowledge of specifications, but often dependent on the supply chain to apply	Departmental specifications are integrated into the skills and knowledge of personnel relative to their role with a clear network of subject matter experts for detailed application	Knowledge of cross-government specifications contribute directly to estate performance with an established network of subject matter and department experts who continuously evaluate and improve the application of specifications across the government estate			
S.20	Leadership	How well do your leaders understand and contribute to standardised specifications?	Basic strategy is established, but with varied vision and buy-in across senior leaders	Senior leaders share common vision for standardisation within the department but lack common action and resource commitment	Department has a clear shared vision and action plan for standardisation, supported by appropriate resource commitment	Vision is shared by all department staff and partners with clear organisational objectives and performance goals for standardisation	Common vision for standardisation shared across government and departments have a clear implementation strategy to achieve and continuously improve			

DIGITALISATION								Current Level	Target Level	Commentary
Code	Capability Set	Question	Level 1 Analogue	Level 2 Digitised (File-based)	Level 3 Data-based	Level 4 Model-based	Level 5 Knowledge-based			
Digital Specifications										
D.1	Interpretability	How is information of requirements accessed and interpreted?	Human interpretation of paper-based data, no machine interpretability	Human interpretation of digitised data, machine can read information with limited processing (e.g. find function in PDF)	Machine can read and provide relevant data on user demand through querying but no machine interpretation, decisions made from human interpretation of the data provided by machine	Machine can read data to extract relevant information, manipulate data based on encoded rules and interpret information through modelling, decisions made from human interpretation of findings provided by machine-interpreted models	Machine can read and understand characteristics of data to manipulate and interpret information from Human decision-making based on recommendations proposed by machine-interpreted knowledge-based models			
D.2	Data processing	How do you extract data from requirements to provide information necessary for delivery?	Data is extracted and processed by human user from analogue format	Data is extracted and processed by human user from digitised format with minor support from machine	Information is encoded through data schema, enabling data to be processed by digital querying of dataset	Information is encoded through data schema and rules are encoded for modelling, enabling data to be extracted and processed by models	Knowledge is encoded through pre-defined rules and machine learning, building upon established data schema and rule-based models for machines to extract and process data independently of human input			
D.3	Tools and Systems	How is data from requirements interpreted into products and asset delivery?	Requirements held in paper-based, printed specifications for human location and interpretation for product development	Requirements held in specifications available in digital file with limited machine processing (e.g. PDF) for human location and interpretation into product development	Requirements stored as structured and unstructured data held in specifications repository (digital library) with defined data schema and classification system allows requirements to be located on demand by user for interpretation and verification, enabling the digital traceability of the "golden thread" of building information	Defined data schema, classification system and rules/formulas/algorithms generate models to assess and verify performance against requirements, maintaining the "golden thread" of building information with some level of automation	Machine learning is able to apply logical rules to access and infer new information and knowledge based on established data schema, rules and models to inform product and asset recommendations against requirements, enabling continuous improvement through traceability of the "golden thread"			
Other Digital Domains										
D.4	Interoperability	How do you share and reuse information from your requirements?	No interoperability with digital platforms	Low interoperability with limited data exchange across restricted range of software	Requirements are encoded in an open data schema (e.g. IFC) and/or in a vendor native file (e.g RVT) allowing a direct link between digital repository of requirements (e.g. Common Data Environment) and selected software applications for delivery	Data exchange of requirement information from and to the Common Data Environment using encoded open data schema and workflows, with integration between software applications from multiple vendors	Full interoperability into digital ecosystems with data exchange of requirements across external networks (e.g. open or public APIs)			
D.5	Information Management	How do you manage information from your requirements?	Specifications are stored as paper copies in physical locations	Specifications are stored as digital files in a digital repository with basic metadata (e.g. Common Data Environment with basic agreed workflows)	Requirements stored within CDE as unstructured data (e.g. paragraphs of text) managed through content management systems and structured data (e.g. tables of data) managed through databases, with established IM workflows and queryable data extraction	Requirements stored within CDE as unstructured data and structured data, with established IM workflows and integrated tools (e.g. models, configurators) for the extraction and modelling of data	Common Data Environment as repository able to interact and exchange information with other repositories from other software using open/public APIs			
D.6	Legal	How do you define commercial models for digital requirements?	Paper-based information requirements only	Commercial models account for exchange and use of static digital files by contracting parties	Commercial models define structured and unstructured information and the responsibilities for the creation and exchange of data by contracting parties	Commercial models support information management and data exchange with automated machine interpretation of requirements, covering respective responsibilities of contracting parties	Commercial models support information management and data exchange of requirements with respect to machine learning and the respective responsibilities of contracting parties			

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