Digital Enablement for Queensland Infrastructure

Principles for BIM Implementation

November 2018

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Introduction

Digital enablement of infrastructure can be delivered by the application of Building Information Modelling (BIM), Digital Engineering, Asset Information Modelling or Virtual Design and Construction. The most broadly recognised terminology of 'BIM' is used in this document to assist the understanding and adoption of these principles.

BIM is the digital representation of physical and functional characteristics of a building, piece of physical infrastructure or environment. BIM serves as a shared knowledge resource for information about an asset throughout its lifecycle—supporting decision making—from strategic appraisal and planning, design and construction to operation, maintenance and renewal.

BIM enables a collaborative way of working using digital processes to enable more productive methods of planning, designing, constructing, operating and maintaining assets through their lifecycle.

Governments in Australia recognise the importance of BIM in the delivery and management of infrastructure assets as it offers many benefits throughout the asset lifecycle and has the potential to drive efficiency, value for money, productivity, innovation and safety.

The Queensland Government recognised the opportunities and benefits that BIM could provide when it launched the State Infrastructure Plan in March 2016. To maximise the benefits from applying BIM to all major infrastructure projects within its annual capital program, these principles will support the effective use of BIM across Queensland Government infrastructure delivery agencies. A focus of these principles includes BIM capability development across government and industry.

Audience and application

The *Digital Enablement for Queensland infrastructure – Principles for BIM Implementation* (the principles) have been produced for use by officers within the Queensland Government including departments, agencies and statutory authorities. The principles apply to those who are involved in any part of the lifecycle of new major construction assets, including the planning, procurement, design, contract management, construction, operation or maintenance of the assets.

The principles are also intended to provide industry with a level of confidence that the Queensland Government is committed to the staged adoption of BIM over the next five years.

Scope

These principles apply to:

- all Queensland Government departments, agencies and statutory authorities
- the design, delivery and asset management of all new major construction projects including those with an estimated capital cost of $50 million or more which commence a detailed business case from 1 July 2019, and those involving significant alterations, extensions, renovations and repurposing of existing assets

- projects where government departments, agencies and statutory authorities see the value in BIM to manage existing assets or projects with an estimated capital value below $50 million.

Objectives

- To provide a framework that enables the use of BIM on the full lifecycle of infrastructure projects, delivering measurable benefits which include:
  - more efficient and on-time project delivery
  - reduced project risk
  - improved safety
  - improved built outcomes
  - improved asset management
  - better whole-of-life management of born digital information assets/public records
  - reduced costs.
- To increase capacity and capability within the public sector to maximise value from the use of BIM on state infrastructure assets.
- To identify ways for BIM to be incorporated into the regulatory and procurement environments.
- To promote consistency and data interoperability in the information requirements for state infrastructure projects to facilitate a harmonised approach for industry.

Principles

Open

The Queensland Government will use an Open BIM[1] approach (using open data standards that are interoperable and archivable) so that BIM information, systems, standards and processes, enable interoperability and interconnectivity.

BIM information will connect with other relevant information (e.g. geographic information systems and asset management systems) and offer easy and efficient accessibility and re-use.

Managed

BIM information will be managed securely at least for the life of the infrastructure asset (from conception to demolition or disposal) in a central repository by the asset

[1] buildingSMART Australasia has defined 'Open BIM' as a process where the digital BIM prototype is structured in a non-proprietary, open-standard format and the associated processes are supported by industry-standard tools for managing information exchange between proprietary software tools and open access to standardised object libraries that host manufacturer's product data. These open formats support collaboration and provide customers with the freedom to choose any BIM software solution, which meets their business needs, knowing that they can share their BIM data easily with others who use different software solutions.

owning/maintaining agency (or an agency such as Queensland State Archives or CITEC).

BIM information will be actively managed as an information asset/public record for as long as it is required to be kept for business, legal, access and other purposes. Active maintenance will include ensuring the records remain current, discoverable (avoiding duplication or recreation) and useable (avoiding data loss or obsolescence).

Effective

The Queensland Government will use BIM on infrastructure projects and on existing infrastructure, as appropriate.

Queensland will work collaboratively with all Australian jurisdictions and the private sector to drive best practice in the use of BIM on Queensland Government initiated public infrastructure.

The Queensland Government will utilise industry best practice and recognise asset class-specific standards for infrastructure projects in consultation with NATSPEC, Standards Australia and relevant international standards, such as ISO 19650.

The Queensland Government will develop specific approaches to advance the use of BIM in the regulatory areas of workplace health and safety, and heritage conservation to support a more pro-active and efficient approach to regulation in these areas.

Queensland Government agencies will continuously improve their BIM capacity and capability. This will include publishing agency endorsed information requirements and BIM management plans that outline the use of federated models which include scheduling, costing and the use of digital models for asset management.

Supported

Relevant capacity and capability will be developed and maintained by agencies (such as the Department of Transport and Main Roads, Queensland Health, the Department of Housing and Public Works and the Department of Education).

The Department of Housing and Public Works will assist and facilitate internal capacity and capability building and the development of Information Requirements in collaboration with other agencies. The Department of Housing and Public Works will continue to be the lead agency for administering the central repository for built asset information on behalf of Queensland Government.

The Queensland Government will work with industry, education, training and research providers to support the development and maintenance of a BIM-skilled workforce including state government officers.

These principles will be incorporated into and align with relevant infrastructure project planning, procurement and assessment frameworks across government.

Implementation and alignment of principles

- The Queensland Government will progressively implement these principles on major state infrastructure projects from 1 July 2019 accelerating the commitment made in the Queensland Government State Infrastructure Plan.
- Agencies are encouraged to progressively implement the principles on existing assets and projects with a value estimated to be less than $50 million.
- Beyond 2023 the application of these principles will be progressively expanded to all built assets.
- Relevant Queensland Government agencies will be required to develop a BIM implementation plan and report progress annually.
- To evaluate the outcomes of implementing BIM, the continuous improvement will be measured and reported by agencies to the Queensland Government, with an initial focus on performance metrics from projects.
- These principles align with the National Digital Engineering Policy Principles[2] and the National Archives of Australia Digital Continuity 2020 policy[3] to ensure consistent approaches for industry across jurisdictions. Other industry and government BIM initiatives, such as the ACIF BIM Knowledge and Skills Framework[4], will be incorporated where appropriate.
- The Queensland Government will ensure its contractual arrangements provide for the delivery of a project information model of the asset to the requirements of the asset owner/maintainer when the asset is handed over to the asset owner/maintainer.
- These principles will be reviewed by the Queensland Government on an annual basis to incorporate project learnings and developments in national and international standards.

[2] https://infrastructure.gov.au/infrastructure/ngpd/files/Principles-for-DE_Template_2.pdf
[3] http://www.naa.gov.au/information-management/digital-transition-and-digital-continuity/
[4] http://www.apcc.gov.au/SitePages/BIM%20Knowledge%20and%20Skills%20Framework.aspx

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