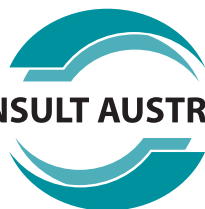


Partnership for Change

Digital technology



AUSTRALIAN
CONSTRUCTORS
ASSOCIATION



CONSULT AUSTRALIA

Partnership for Change

The Australian Constructors Association and Consult Australia have joined forces to bring forward sector-wide reform proposals through our Partnership for Change initiative. The initiative demonstrates a solutions-based approach to improve productivity and address challenges in the built environment.

The publication of a series of joint thought leadership papers will provide the basis for collaborative discussions between government, contractors and consultants to drive positive change.

Partnership for Change papers:

👉 Digital technology (this paper)

- 👉 Multiple design reviews
- 👉 Model client
- 👉 Reliance on information

Case for change

The adoption of technology is occurring rapidly on a global scale, bringing with it increased productivity and optimised customer and sustainability outcomes. As more industries transition to digitisation, the need to focus on smarter ways to create and interact with the built environment is quickly coming into focus. In addition, the smart infrastructure and smart cities movements aim to foster the adoption of digitisation and push the built environment into the future.

Uptake of technology within the construction and consultant sectors is lagging other major industries. In fact, the construction industry is the second least digitalised amongst all sectors¹ and the application of technology is uncoordinated which is limiting the ability to make sustainable data-driven decisions. Not surprisingly, productivity growth in the construction industry has trailed other major industries by 25 per cent over the past 30 years.

1. McKinsey and Company Reinventing Construction: A Route to Higher Productivity, February 2017.

With governments relying on contractors and consultants to lead the post Covid economic recovery through the design and construction of the rapidly expanding pipeline of major infrastructure work,² digital will be a key enabler to deliver the pipeline along with a sustainable and competitive industry. It is critical that a national led and coordinated approach is taken with prioritised investment to support digital adoption along with digital capability and capacity building to deliver a world class approach. Without this, the industry's ability to deliver the pipeline may be compromised, along with the ability to realise productivity gains and optimised customer and sustainability outcomes that a digital-first approach can provide.

Inconsistent adoption of technology

Key reasons for inconsistent adoption in our industry include:

Government policy and requirements

Government policy and maturity around digital transformation is disparate at all levels—organisational (government departments), state/territory (state governments/ councils) and national (federal government). Inconsistency and differing interpretation of digital policy is a significant contributor to unclear requirements and setting unachievable goals. Furthermore, the maturity level and capabilities of government organisations is limited and the capacity to leverage digital deliverables for broader application within the operations space is not realised.

Whilst digital frameworks such as the Transport for NSW Digital Engineering Framework and Office Projects Victoria – Victorian Digital Asset Strategy (VDAS) exist, their adoption and translation into project requirements is ad-hoc. The industry's capacity to implement technology at scale is impaired due these inconsistencies.

Procurement and contract model

Current procurement and contract models do not foster integrated project delivery. Integrated and collaborative approaches are key enablers in technology adoption and promote advancements in innovation through incentivisation schemes. Some collaborative contracts are adopted; however, many are delivered under traditional procurement methods.

Current procurement models focus predominately on traditional processes and analogue deliverables (e.g. paper-based drawings, operations and maintenance) and the legal and commercial frameworks that underpin these procurement models have limited provisions for the adoption or reliance on advanced digital data such as Building Information Modelling (BIM). This is a key barrier for the adoption of digital engineering & BIM technology within the Australian market.

2. BIS Oxford Economics estimates the value of 'mega' transport projects between 2020-2024 is to nearly double.

Capability and capacity

The Australian built environment industry is experiencing a national skills shortage across all sectors. An ageing workforce coupled with a lack of millennials joining the construction sector is further compounding the industry skills shortage.³

The capacity to introduce new digital technologies against this backdrop requires significant investment and resources to generate meaningful change and sustainable outcomes. Whilst industry frameworks do exist, along with incentives to upskill and build capability (e.g. Construction Skills Queensland), they often follow a traditional curriculum that doesn't extend to digital technologies. Further, the responsibilities for training and upskilling typically rest with the main contractor. Without appropriate investment or provisions towards a curriculum addressing the digital challenge, the disconnect between current practises and future developments will continue to inhibit technology adoption.

Actions

To derive the greatest benefits from digital technology we must adopt at-scale digital methods across the entire supply chain and the asset lifecycle. Outlined below are recommended solutions with examples to achieve this.

Establish a central government body

There is currently no formal government coordination of a national standard approach to support the digitisation of the industry. Furthermore, government clients require industry insight to minimise the cost of specifying processes which industry is not yet capable of delivering. Therefore, the adoption

of a centralised, federally funded governing body which draws together governments, government agencies, industry, industry bodies and academia is required to drive industry transformation and meaningful change. This will enable a harmonised Australia-wide approach to the use and application of information, technology and digital upskilling. Further, it will build on foundational frameworks such as those in NSW, VIC, ACT and QLD and bodies such as The Australian BIM Advisory Board (ABAB) to create a consolidated and unified approach. This central agency should also be tasked with defining a digital first, whole-of-life approach to asset procurement and demonstrate through real examples the return on investment from such an approach.

The Centre for Digital Built Britain is an example of a central body established to transform the UK construction industry's approach to the way it plans, builds, maintains, and uses social and economic infrastructure. The Centre for Digital Built Britain is a partnership between the Department of Business, Energy and Industrial Strategy and the University of Cambridge.

3. Australian Bureau of Statistics: 6291.0.55.003 Labour Force, Australia, Detailed, Quarterly, Data Cube EQ12 - Employed persons by Age and Industry division of main job (ANZSIC), November 1984 onwards - modelling shows workers (50+) now account for 23.6% of the workforce, were as they only accounted for 17.5% in 1997 and the percentage of the construction workforce under the age of 30 has only increased by 0.6% and the percentage of those aged 30-49 has decreased 6.7%.

Adopt a national government policy

To drive a consistent standard to digital technology, a national approach needs to be adopted leveraging international standards and industry best practice. The policy must:

- adjust traditional contract and legal frameworks to adopt those that facilitate the use of digital technologies
- adopt a minimum set of standards in government contracts which progressively mature over a specified timeframe to enable investment certainty and capability development. As a minimum this should extend to the adoption of ISO19650 for centrally procured projects to ensure standardised information management requirements.
- establish a governing body chartered to drive industry transformation focused on developing the national standard and driving the digital agenda
- build upon foundational frameworks such as those in NSW, VIC, ACT and QLD as well as leveraging international standards and best practice from international approaches such as UK, Scotland and Singapore and consolidating into single unified national approach.

Adopt procurement and contract models that promote investment in innovation

Contracting models such as ECI and Alliancing adopt weighted risk profiles across stakeholders and project lifecycles and encourage and promote investment in innovations such as digital technologies.

The Victorian Level Crossing Removal Project is an example of a project using an approach where continuous improvement is measured, and key result areas are assigned to support the adoption of innovative new ways of working.

The approach allows contractors to invest in the knowledge that they will be reimbursed and potentially share in any upside from these new processes.

Provide incentivisation schemes to build capability and capacity

Education, training and incentivisation schemes should be used to promote technology adoption and lift capability and capacity, as well as drive a digitality enabled supply chain. These schemes should be supported by:

- the development of a learning and education framework to address the skills shortage with a specific focus on digital technologies and supporting the re-skilling required amongst the existing workforce to adopt digital practices, along with encouraging millennials into the construction industry.
- government investing in globally recognised industry specific TAFE & Tertiary education courses to provide future graduates the required support for broad-scale adoption of digital technology.
- the establishment a central industry resource and capability body, to provide programs to educate and digitally upskill the supply chain. An example includes the Victorian Tunnelling Centre which offers specialist training to workers in the construction and operation of a variety of tunnels including rail, road, and utilities tunnels.

Partner with technology providers

Due to the pace of change and investment required in technology, it is critical that partnership is sought with the technology providers to ensure development is aligned to industry capability and demand, considering:

- technology vendors ensuring interoperability across platforms for information and data exchanges
- establishment of technical working groups to align industry operational and technology requirements
- the critical need for adoption of standardised information requirements, common data schemas, open data formats and technology agnostic approach
- clarity on solutions for the Common Data Environment, which is the collaborative heart of any project delivery/asset management activity
- adoption of open data approach to enable firms to leverage data in key decision-making.

Prioritise and further invest in industry and advanced technology programs

Once implemented, advanced technologies are resulting in a fundamental shift in the way firms in this sector have traditionally done business. To ensure the industry remains competitive it is critical to prioritise and invest in technology.

Examples of such programs and investment which are driving not just industry but wider economic benefits in a post COVID-19 digital world include:

- Building 4.0 CRC is an industry-led research initiative co-funded by the Australian Government. The CRC has three programs focused on Sectoral Transformation, Digital Transformation and Building Transformation which aim to develop an internationally competitive, dynamic and thriving Australian advanced manufacturing sector, delivering better buildings at lower cost and the human capacity to lead the future industry.
- Data61 is CSIRO's data and digital specialist data sciences arm. Data61 is taking a world leading approach through collaboration with industry to draw together Digital Twins on a precincts and cities scale.
- Victorian Construction Technologies Sector Strategy provides the framework to enable the sector to innovate, grow and capitalise on its capabilities, while leveraging Victoria's high-quality offerings in research, education, supply chain and project delivery.
- Western Sydney University Centre for Smart Modern Construction (c4SMC) is an industry collaboration initiative embracing smart technologies and processes in delivering a modern construction industry.

