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Policy Insights Paper

Policy opportunities to strengthen digitalisation of the New South Wales construction sector

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Acknowledgment of Country

The Australian Public Policy Institute acknowledges the Gadigal people of the Eora Nation and the Ngunnawal people upon whose ancestral lands our Institute stands.

We pay respect to Elders both past and present, acknowledging them as the traditional custodians of knowledge for these lands. We celebrate the diversity of Aboriginal peoples and their ongoing cultures and connections to the lands and waters of NSW.

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Authorship

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Executive summary

The Australian construction sector is undergoing a profound transformation with the onset of the fourth industrial revolution. Rising demand for housing and infrastructure, driven by population growth alongside economic and environmental pressures, has intensified the need for greater efficiency and innovation. Yet, the construction sector remains one of the least digitalised industries and continues to struggle with relatively low productivity compared to others.[1] Digitalisation is no longer a choice; it is a strategic imperative to enhance productivity, efficiency, safety, and sustainability.

In New South Wales, despite the sector's pivotal economic role, efforts to stimulate construction productivity have been constrained by several factors, including persistent skill shortages and coordination challenges. In an effort to expedite the adoption of technology in the sector, the recent launch of the Infrastructure NSW (INSW) Digitalisation and Data Policy establishes a coordinated policy framework to embed digital practices across infrastructure planning, delivery, and asset management.[2]

To operationalise the Digitalisation and Data Policy, agencies will need clear guidance and practical tools to translate its principles into actionable outcomes. Findings from this study highlight significant opportunities to advance digitalisation across the sector. These include enhancing coordination between federal and state initiatives, increasing investment and funding support, strengthening digital literacy and interoperability, improving cybersecurity resilience, and expanding the participation of small and regional enterprises.

This paper identifies six policy opportunities to support strengthening the digital transformation of the NSW construction sector, including: establishing a national coordinating body to align state and federal initiatives; mandating open standards and interoperability across software, platforms, and data environments to improve collaboration and efficiency; embedding digital deliverables in procurement and contracts to encourage and accelerate sector-wide adoption; creating certification and capability programs to help build digital competence across the workforce; extending digitalisation policies across the entire asset lifecycle, from planning and design to operations and maintenance; and stimulating innovation through targeted incentives and research and development (R&D) support.

To help facilitate action across these opportunities, this paper provides an overview of the digitalisation of construction (DigiCon) Policy Directions Framework. Developed through comprehensive research and engagement with government and industry stakeholders, the DigiCon Framework provides a structured approach for agencies to design, monitor, and evaluate their digitalisation initiatives in line with the INSW policy.

Through these coordinated actions and use of the DigiCon Framework, policymakers can establish a connected, data-driven, and future-ready construction ecosystem that boosts productivity, reduces inefficiencies, and positions NSW and Australia as global leaders in digital innovation and transformation.

Policy opportunities – at a glance

The DigiCon Policy Directions Framework outlined in this paper provides a practical, evidence-based roadmap to guide digital transformation across the NSW construction sector, complementing the recently launched NSW Infrastructure Digitalisation and Data Policy. The following six policy recommendations emerge from the objectives and directions identified by the Framework.

1 **Establish a national coordinating body for digital transformation in construction** to provide leadership, align state and federal-level initiatives, and drive a consistent digital transformation agenda for the construction sector.

2 **Promote open standards and interoperability** across software, platforms, and data environments to improve efficiency, collaboration, and project integration.

3 **Embed digital deliverables in procurement and contracts**, ensuring Building Information Modelling and other digital tools are standard requirements, not optional add-ons.

4 **Create certification programs to build workforce competence and support SMEs**, equipping workers and SMEs with the skills needed to adopt and manage emerging technologies.

5 **Extend digitalisation policies across the full asset lifecycle**, from planning and design through to operations and maintenance, including the use of digital twins and integrated delivery systems.

6 **Stimulate innovation through incentives and research and development support** to strengthen Australia's global competitiveness.

Digitalisation of construction

Digitalisation is increasingly recognised as a key driver of productivity and growth across economic sectors, including construction. Despite its vital role in national development, the construction sector continues to experience persistently low or uneven adoption of digitisation compared to other areas, both globally and in Australia, with knock-on effects for productivity.[3] Digitalisation presents a clear opportunity to reverse this trend by improving resource management, reducing waste, enhancing decision-making, and strengthening worker safety. It can also increase efficiency, collaboration, and risk management throughout the project lifecycle.

The state of digital maturity in the Australian construction sector

The Australian construction sector has historically lagged behind other sectors in digital transformation, a gap closely linked to its ongoing productivity challenges. Over the past decade, productivity growth in construction has remained significantly below that of other industries. Cost overruns, inefficiencies, and uneven adoption of technology persist across the sector.

While there have been positive signs of progress, uptake remains slow.[4] The Australian Broadband Advisory Council identified construction as one of the slowest industries to embrace digital innovation. Similarly, research identified that nearly 50 per cent of construction organisations remain at the early stages of digitalisation.[5] Nevertheless, market and regulatory pressures are beginning to drive change.

Digital capability also varies widely by organisation size. Tier-1 firms and large consultants have invested in digital systems and analytics, while small and medium-sized enterprises (SMEs), which make up the majority of the construction sector, continue to rely on manual or semi-digital processes.[6] This uneven progress highlights the need for targeted policy interventions and support mechanisms.

Despite emerging improvements in areas such as data connectivity, the sector overall continues to trail global peers in adopting advanced technologies such as artificial intelligence (AI), digital twins, and automation.[7] Numerous barriers, including cost, capability gaps, and fragmented governance, continue to constrain widespread adoption.[8]

Governments worldwide have introduced various strategies and frameworks to support the digital adoption of construction. While considerable progress has been made, there remain significant opportunities to further align policies and accelerate digital transformation across the sector. There have been calls for more coordinated approaches across regions and jurisdictions, clearer standards and mandates, and greater support for skills development to enable broader adoption, particularly among smaller construction enterprises.

The Digital Maturity Model

The Digital Maturity Model (Annex A), proposed by Perera et al. (2023)[9], defines four progressive levels of digitalisation within the construction sector.

Each level is characterised by distinct capabilities, processes, and technology adoption patterns. This model enables benchmarking of organisations, identification of capability gaps, and development of tailored support programs to lift digital maturity across all firm sizes.

1 **Basic Digitalisation**: Use basic technologies such as internet connectivity, having a website, and using email to improve business operations. Organisations at this stage typically use spreadsheets, computer-aided design (CAD) software, and telephones for communication and quotations. There is little or no formal digital training or research and development investment, and ICT spending is minimal—less than 1 per cent of turnover.

2 **Advanced Digitalisation**: Use technology in more advanced ways to improve operations, including social media data analytics, SaaS platforms, and multi-party collaboration tools such as MS Teams or Slack. Designers use BIM and advanced software for analytics and rendering, while builders utilise digital devices and IoT tools for data collection and management. There is growing use of big data and digital manufacturing techniques, with ICT investment typically between 1 per cent and 3 per cent of turnover.

3 **Smart Digitalisation:** Achieve integrated use of digital technologies such as online platforms, automated supply chain systems, and benchmarking tools. Organisations adopt LiDAR, drones, and AR/VR technologies for design, logistics, and performance monitoring. Builders use ERP systems integrated with IoT and robotics, while R&D investment rises to between 1 per cent and 3 per cent of turnover, and ICT investment increases to between 3 per cent and 5 per cent.

4 **Transformative Digitalisation:** Demonstrate digital and management capability that enables business transformation through digital assets and new business models. Organisations at this level use fully integrated, tailor-made ERP systems, advanced cyber-physical systems, and digital twins. They conduct high-level R&D for business transformation, manage enterprise-wide digital assets, and embed e-procurement and AI-driven automation in construction. ICT investment exceeds 5 per cent of turnover, reflecting a mature, innovation-driven digital ecosystem.

Consistent with previous research, the majority of interviewees in the study indicated that the NSW construction sector remains predominantly at the Basic Digitalisation level, reflecting limited integration and use of advanced digital technologies across the industry.[10]

Policy landscape and opportunities to drive digital transformation

There Australia has made progress in establishing industry frameworks and standards for digitalisation; however, implementation remains largely state-led. Federal, state, and local initiatives, such as the *Australian Infrastructure Plan, the Smart Cities and Suburbs Program*, and early state-level frameworks in Queensland (2017)[11] and Victoria[12], have laid the groundwork for digital transformation. National platforms like the Australian Building Information Modelling Advisory Board, the adoption of information and digitalisation standards, and advocacy by industry professional bodies such as buildingSMART Australia have further advanced discourse around digital practices. Broader federal policies, including the *ICT Cyber Security and Digital Government Strategy 2024*[13] and the *Whole-of-Government Digital Services Policy 2017*[14], support digital government operations but do not directly address the construction sector's unique needs.

The recent release of the NSW Infrastructure Digitalisation and Data Policy in September 2025 marks a pivotal shift in the policy landscape. It establishes a comprehensive, principle-based framework to embed digital practices across all stages of infrastructure planning, delivery, and asset management. The policy mandates government agencies to establish governance structures, develop digitalisation strategies and implementation plans, conduct maturity assessments, and invest in capability uplift to drive infrastructure digitalisation. It also introduces mandatory actions for managing data as an asset, adopting interoperable technologies, and integrating lifecycle-based information management.

While the NSW policy provides one of the most cohesive and actionable frameworks in Australia, there are opportunities to build on this momentum at a national level, including:

- **Establishing a coordinated national framework** to extend Building Information Modelling (BIM) and digitalisation efforts beyond state-led initiatives.
- **Promoting interoperable data ecosystems** to improve collaboration across jurisdictions.
- **Developing national policies and strategies** that explicitly advance the digitalisation of the construction sector.
- **Expanding training and certification programs** to address skills gaps in BIM and Virtual Design and Construction.
- **Enhancing integration across the asset lifecycle**, ensuring digitalisation extends from design and construction through to operation and maintenance.
- **Strengthening research, innovation, and incentive mechanisms** to align Australia's progress with global leaders such as the UK and the EU.

International best practice

In contrast to countries where strong policy interventions, compliance mechanisms, and funding incentives have accelerated digital adoption, Australia continues to rely heavily on voluntary and market-driven initiatives. This has led to uneven implementation and a widening digital divide between large enterprises and the micro, small, and medium-sized enterprises that dominate the construction sector.

The lack of harmonised standards and governance across states and territories further restricts interoperability and the creation of integrated digital ecosystems, such as those mandated under national BIM or digital twin programs in other global jurisdictions.

Table 1 | Comparative overview of global best practices

DIMENSIONS OF COMPARISON	GLOBAL BEST PRACTICES	AUSTRALIA – CURRENT STATE
National coordination	UK's Centre for Digital Built Britain, Singapore BCA	No central authority; state-led frameworks
Standards & interoperability	Mandated in UK, Denmark, Singapore	ISO 19650 adopted but voluntary
Procurement & contracts	UK's Construction Playbook, Finland's BIM-linked payments	Legacy 2D deliverables dominate
Skills & training	Singapore CPD, UK CITB programs	Patchy, no national program
Lifecycle integration	UK Digital Twin, Singapore IDD	Focus on design/construction
R&D support	EU Horizon, UK Innovation Hubs	Limited

Construction industry insights on digital technology

To better understand how Australia might respond to these opportunities and where additional supports might be offered, we undertook a multimethod research project.

It commenced with a comprehensive review of academic and industry literature to establish the theoretical foundation. This was complemented by extensive industry engagement activities involving more than 100 participants, providing practical insights from across the construction sector. In-depth interviews were undertaken with 38 key stakeholders and representatives from major professional bodies, including the Australian Institute of Building, the Australian Institute of Quantity Surveyors, the Australian Institute of Architects, the Chartered Institute of Building, the Urban Development Institute of Australia, the Master Builders Association, buildingSMART, and Engineers Australia, to ensure sectoral relevance and applicability.

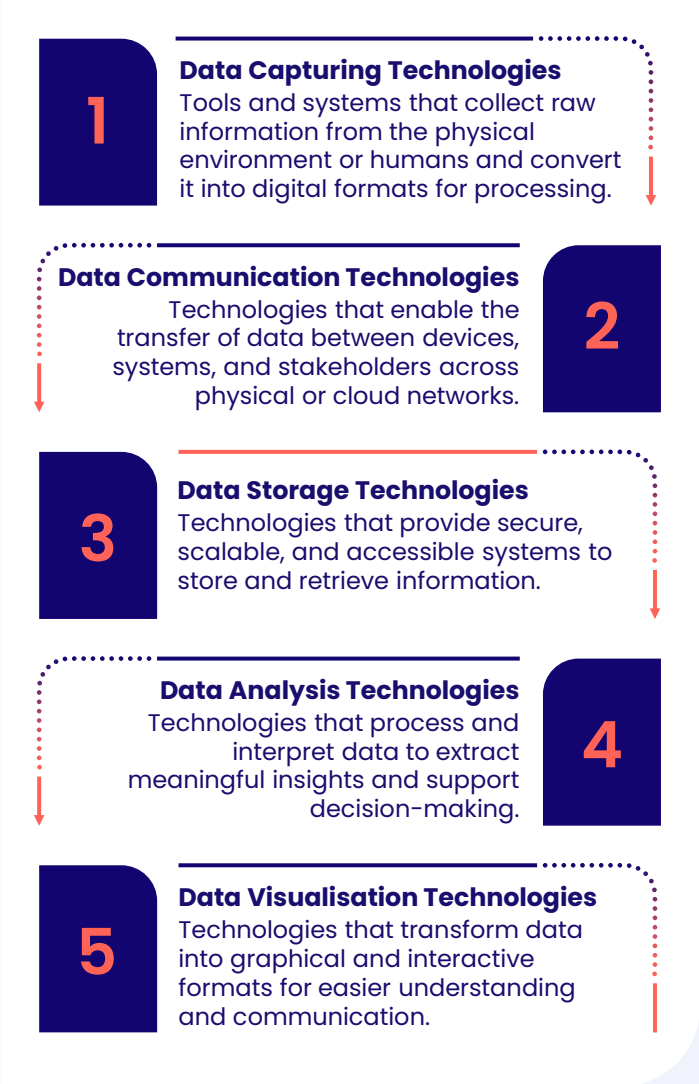
Typology of technologies

Identifying demand for existing technology in the construction sector is a crucial first step in mapping policy opportunities for government. This is important because of:

- The unique functions served by each technology
- The need for integration among technologies
- Considerations for resource allocation and prioritisation
- Assessing readiness and scalability
- Ensuring security and regulatory compliance

Through a comprehensive review, fourteen technologies currently available in the Australian construction sector were identified. These technologies were categorised into five groups based on their primary functionalities (see Annex B). Individual technologies rarely operate in isolation; they must function collaboratively to achieve optimal task performance. This categorisation helps identify complementary technologies that can be integrated to enhance overall system efficiency and effectiveness, and what policy levers may be necessary to ensure that their adoption supports wider productivity aims.

Figure 1 | Typology of Digital Construction Technologies



Prioritisation of construction tasks and industry demand for technologies

To understand where digitalisation can deliver the greatest impact, insights were gathered from a survey of industry experts and practitioners. Respondents assessed the importance of digitalising key construction tasks across the project lifecycle and identified the technologies most relevant to their work. The findings provide a clear picture of where digital investment and policy support should be directed.

Digitalisation was strongly supported across all project phases; from planning to handover. The most critical areas identified were those linked to cost, coordination, documentation, and performance monitoring.

- **Planning phase:** *Project estimating and budgeting* emerged as the top priority for digitalisation (97 per cent agreement), indicating a clear need for digital tools to improve early cost forecasting and resource planning.
- **Design phase:** *Developing detailed coordinated drawings* ranked highest (97 per cent), highlighting the central role of BIM and related software in design integration.
- **Procurement phase:** *Procurement of materials and tendering* were most valued for digitalisation, reflecting the potential of digital procurement systems to improve transparency and reduce costs.
- **Construction phase**: *Document management* (93 per cent) and managing construction operations (90 per cent) were seen as critical for improving on-site coordination and record-keeping.

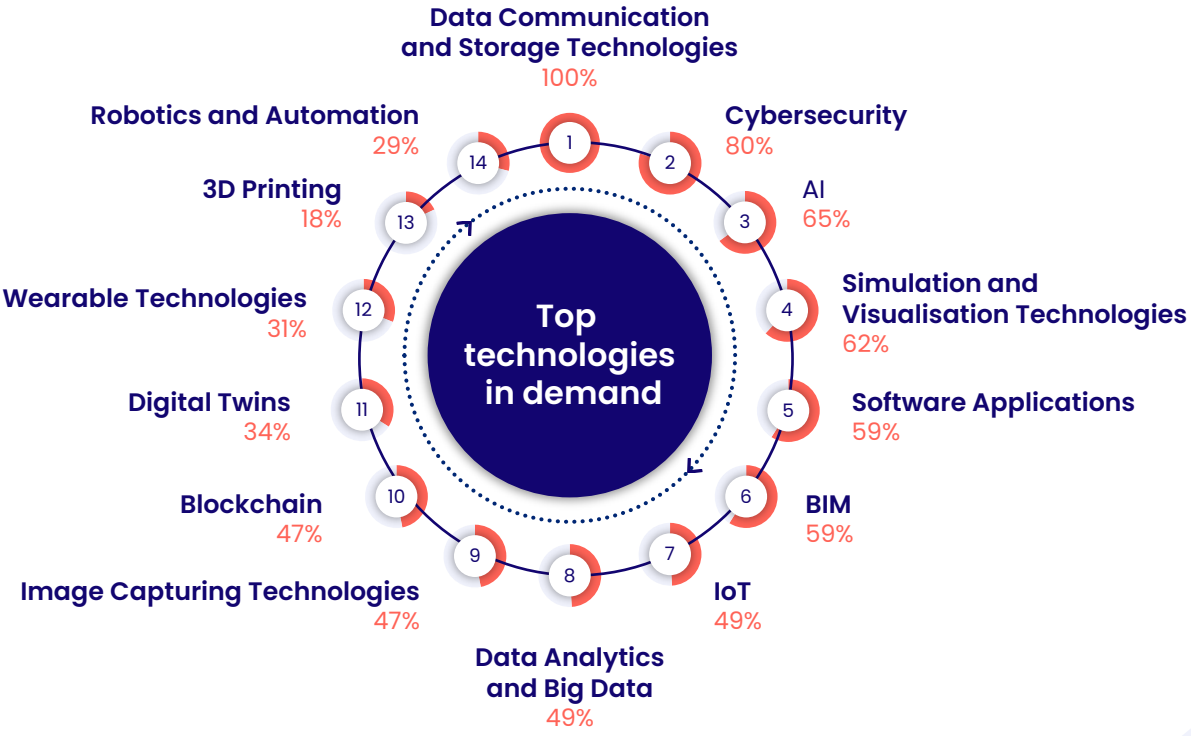
Commissioning and handover phase: Monitoring building performance (93 per cent) was identified as the highest priority, underscoring the value of digital twins and smart monitoring systems for operational efficiency.

Across all stages, respondents expressed strong support for digitalising project management, cost estimation, coordination, and data management processes. These represent the most immediate opportunities for government and industry to improve productivity through digital adoption.

When asked about technology needs, respondents showed the strongest demand for tools that support **data sharing, storage, and security**, signalling an industry-wide appetite for more connected and reliable digital systems (Figure 2).

- **Highest demand**: Data communication and storage technologies (100 per cent), cybersecurity (80 per cent), and artificial intelligence (65 per cent).
- **Moderate demand:** Simulation and visualisation tools, BIM applications, Internet of Things (IoT) and sensor technologies.
- **Lower demand:** Robotics, 3D printing, wearable technologies, and blockchain—indicating early-stage adoption or limited awareness.

Figure 2 | Industry demand analysis of technologies



The findings suggest that the construction sector is ready to adopt technologies that enhance data integration, interoperability, and secure information exchange, but further support is needed to encourage the uptake of more advanced digital tools.

These findings point to several opportunities for policymakers:

- Target digital investment toward high-impact areas such as cost estimation, design coordination, and performance monitoring.
- Strengthen support for data infrastructure and cybersecurity, which underpin broader digital transformation.
- Promote training and awareness programs to increase understanding of emerging technologies like AI, robotics, and digital twins.
- Incentivise SMEs to adopt digital procurement, document management, and monitoring tools to improve consistency and competitiveness across the industry.

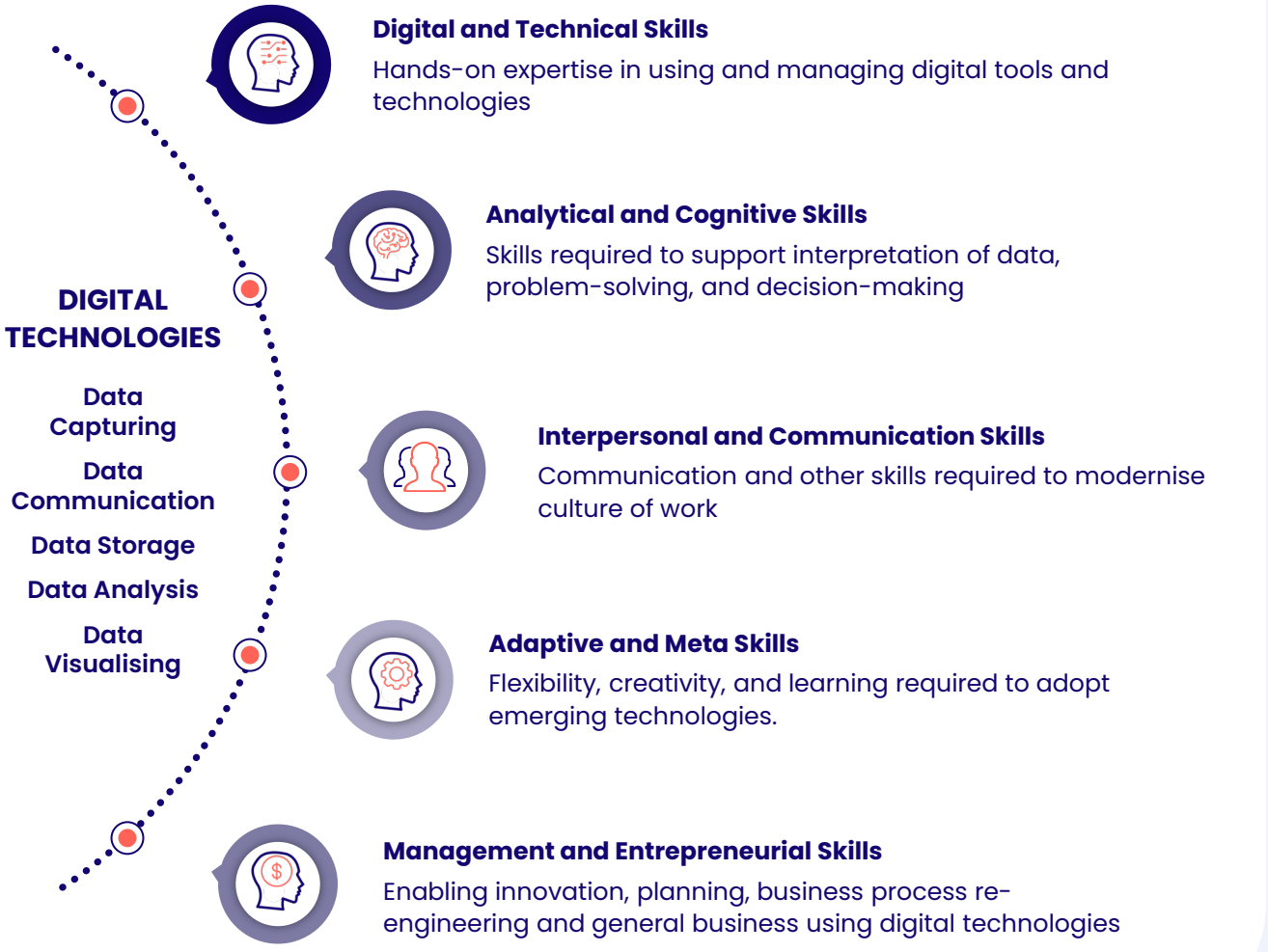
Together, these priorities provide a clear pathway for accelerating digitalisation in NSW's construction sector and for designing policies that enable broad-based adoption of effective and scalable technologies.

Digital skills required for digitalisation

Digital skills are a critical component, as technologies alone cannot drive transformation. People must be able to apply these tools effectively. Even the most advanced technologies will fail to deliver value without the right skills in place.

This study identifies five key categories of digital skills essential for enabling digitalisation in the construction sector (Figure 3).

Figure 3 | Industry demand analysis of technologies



Drivers and barriers to digitalisation

The factors influencing digital transformation in the construction sector were identified through industry consultations and expert discussions conducted during this study. Stakeholders were asked to evaluate a range of organisational and industry-level factors that either facilitate or hinder digital adoption. These factors were then categorised as drivers or barriers (Figure 4) based on participants' consensus and perceptions of their influence within their organisations.

Two drivers emerged as central to advancing digitalisation: 1) operational efficiency and cost effectiveness, and 2) strong organisational leadership and support. These reflect the industry's recognition that digital tools can deliver measurable gains when supported by clear commitment and strategic investment. Conversely, the most significant barriers were identified as inadequate cybersecurity and data protection frameworks and poor interoperability across software and digital platforms.

These challenges highlight the pressing need for coherent policy direction on data security standards, improved systems integration, and cross-industry collaboration to enable consistent and secure digital operations. While the construction sector is motivated by efficiency and leadership-driven change, progress will depend on addressing systemic barriers through stronger governance, standardisation, and investment in digital infrastructure.

Figure 4 | Drivers and barriers for the digitalisation of the construction sector

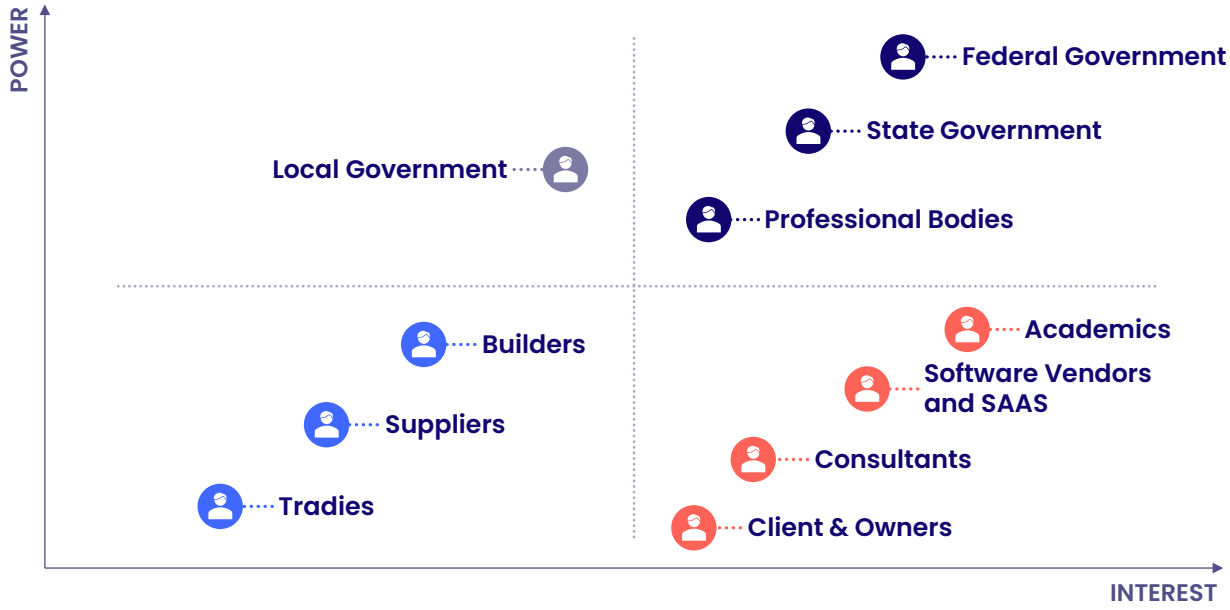
BARRIERS	DRIVERS
Inadequate cybersecurity measures and data protection framework.	Drive operational efficiency and cost effectiveness.
Poor interoperability across software and digital platforms.	Strong organisational leadership and support.
Shortage of skilled workforce for digital processes.	Innovation to boost competitiveness.
Weak data governance, including access control and confidentiality.	Flexible work models through remote accessibility.
Limited appeal to digitally savvy, next-generation workforce.	Efficient government digitalisation with cross-platform data sharing.
Integration challenges with legacy systems and traditional practices.	Agile responses to market and industry shifts.
Insufficient digital literacy across the construction workforce.	Alignment with national digital standards and regulations.
Fragmented stakeholder engagement and inefficient data sharing.	Growing demand for digital solutions from clients.
High initial costs associated with digital transformation.	Supportive government policies and incentives.
Complexity in managing and analysing numerous sources and large volumes of data.	
Delayed or uncertain return on investment in digital technologies.	
Unavailability of industry standards for CDE managing construction projects.	

Governance and stakeholders to spur digitalisation of construction

Effective digital transformation relies on coordinated governance and collaborative engagement across all levels, including state and federal governments, professional bodies, and local councils.

The study examined stakeholder involvement in both public policy and organisational policy development relating to digital transformation in the construction sector. Stakeholders were mapped according to their relative levels of power (influence on decision-making) and interest (commitment to advancing digitalisation). This analysis provides a clear basis for developing targeted engagement strategies that ensure balanced and inclusive policymaking.

Figure 5 | Power-Interest matrix for public policy development

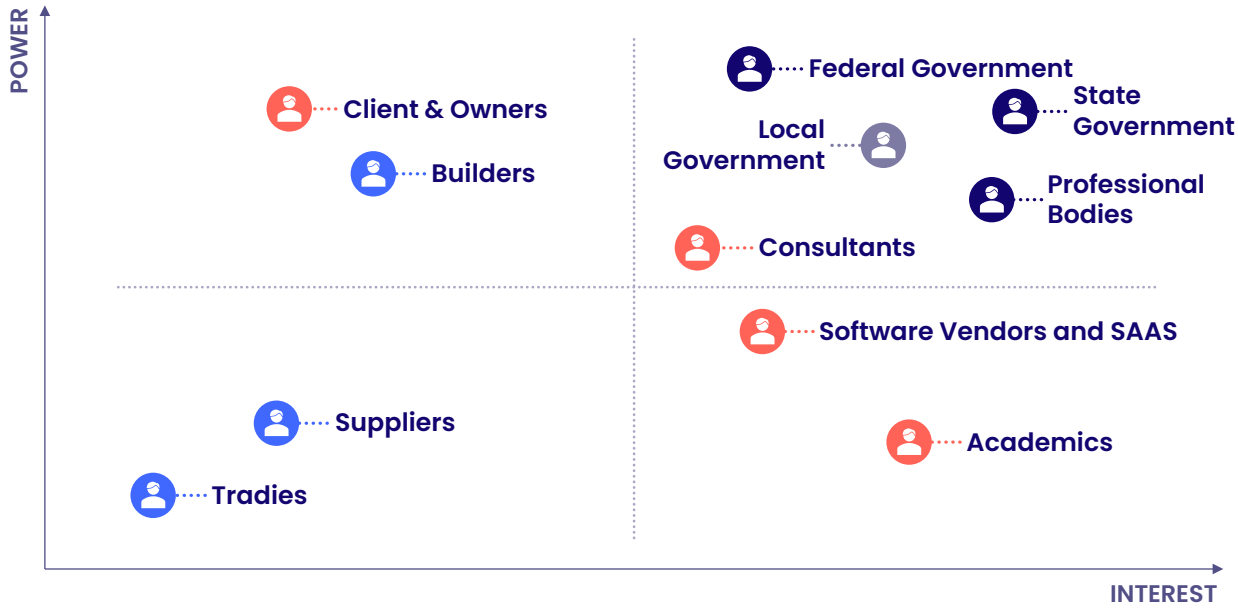


In the context of public policy, federal and state governments, together with professional bodies, occupy positions of high power and high interest, underscoring their central role in shaping regulatory frameworks and national direction. Local governments demonstrate strong institutional power but relatively lower interest, highlighting an opportunity to strengthen engagement and alignment with state and national initiatives.

Stakeholders such as academics, software vendors, and consultants exhibit high interest but limited power, positioning them as valuable sources of technical expertise and evidence to inform decision-making. Meanwhile, tradespeople, suppliers, and builders, though positioned in the low power–low interest quadrant, provide essential on-the-ground insights that support practical implementation and policy translation.

This distribution indicates that effective digital policy for the construction sector requires both top-down coordination and bottom-up participation to ensure policies are informed, implementable, and widely supported.

Figure 6 | Power-Interest matrix for organisational policy development



Within organisational and private-sector contexts, federal, state, and local governments, along with professional bodies, continue to exert influence through regulatory settings, compliance standards, and certification frameworks. Clients and owners, alongside builders, hold significant power to shape digital strategy, procurement standards, and investment decisions within projects.

Consultants and software vendors demonstrate moderate power and high interest, reflecting their active roles in providing digital solutions and strategic advice to industry. Researchers contribute innovation and research insights but have limited influence on direct implementation. Tradies and suppliers remain low in both power and interest; however, their role in operationalising digital practices at the project level remains vital for successful adoption.

Overall, the analysis underscores the importance of collaborative governance, where public and private stakeholders align on shared goals, reinforce compliance and capability-building, and drive digital transformation across the sector through coordinated policy action.

Framework to guide the development of policies towards digitisation of construction

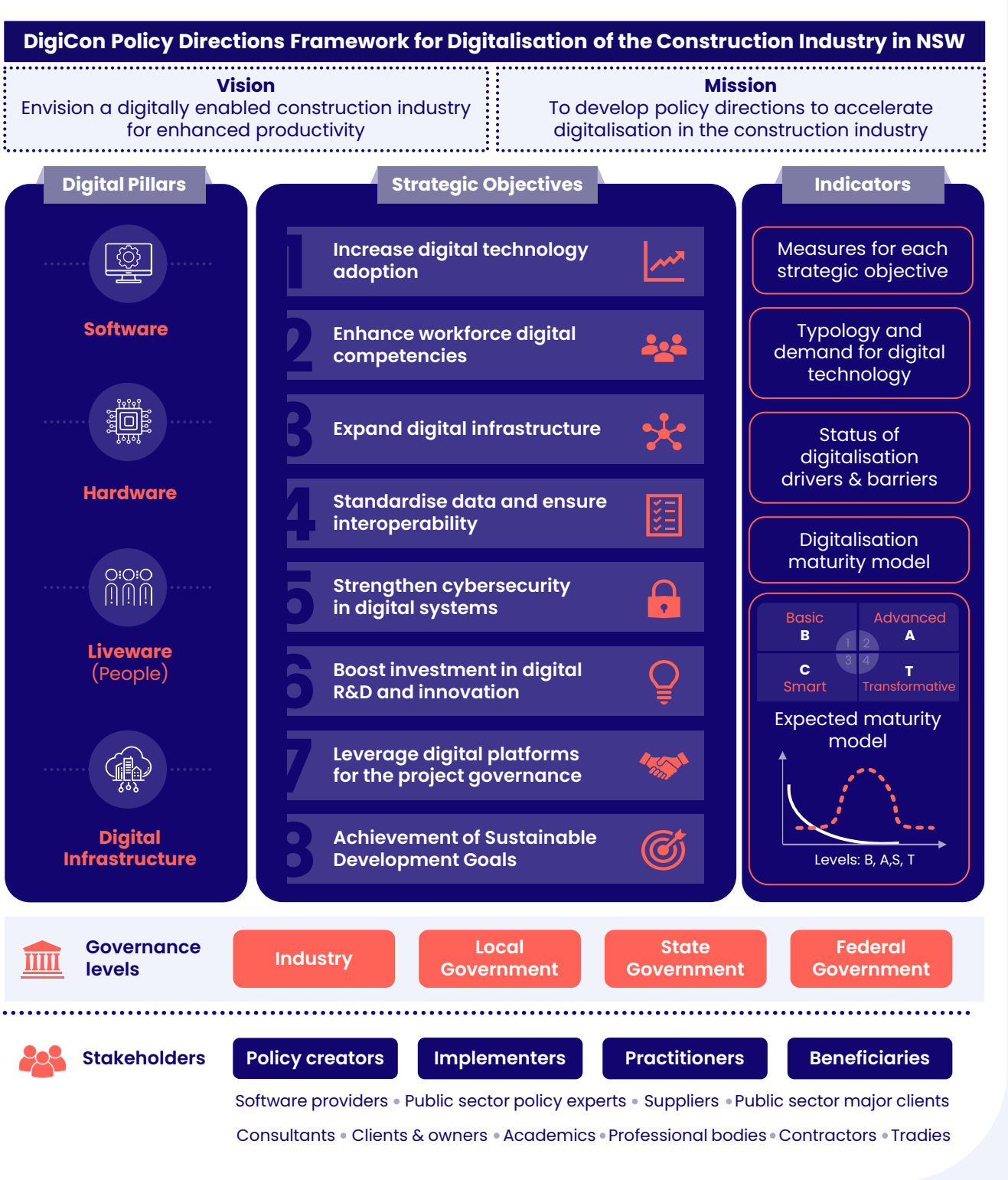
To incorporate these findings into a comprehensive action framework for government, the DigiCon Policy Directions Framework was designed to provide a cohesive, evidence-based approach to guide digital transformation in the NSW construction sector. The framework was developed as a toolkit to assist policymakers in developing policies that encourage digitalisation of construction. It identifies how government, industry, and research institutions can coordinate efforts to accelerate digital adoption, improve productivity, and strengthen the state's economic competitiveness. For NSW policymakers, the Framework can serve as a toolkit to support the implementation of the NSW Infrastructure Digitalisation and Data Policy.

At its core, the framework recognises that digitalisation is not solely a technological shift; it is an organisational, cultural, and policy transformation. Through stakeholder consultations and empirical evidence, the framework defines the ecosystem required for a thriving digital construction sector: enabling policy, interoperable systems, skilled people, and strong infrastructure.

The preliminary framework was subsequently refined and validated through a forum of public policy experts to confirm its robustness and policy alignment.

The DigiCon Policy Directions Framework can be found at https://digicon.au and the full technical report can be accessed at: https://doi.org/10.26183/jf0p-zx02.

DigiCon Policy Directions Framework



Pillars

The framework identifies four key pillars that underpin effective digitalisation policies. Any digital development solution will involve one or more of these pillars.

Software – enabling integration and innovation

Software systems form the foundation for digital communication, data analytics, and project management. Interoperability, affordability, and the adoption of open standards are central to enabling seamless collaboration across the supply chain.

Hardware – building reliable digital capability

Hardware supports data management, cloud integration, and secure storage. Adequate infrastructure and investment in modern equipment are essential for the effective implementation of digital tools.

Liveware (People) – empowering digital competence

People remain at the centre of digital transformation. The liveware pillar emphasises digital skills, leadership, and collaboration, ensuring the workforce has the knowledge and support needed to implement new systems and processes.

Digital Infrastructure – ensuring connectivity and cybersecurity

Reliable connectivity and robust cybersecurity frameworks underpin a digitally enabled sector. Investment in broadband, data centres, and cyber resilience ensures the integrity and safety of digital construction processes.

Strategic objectives

Eight strategic objectives define what the NSW construction sector must achieve to transition into a digitally mature industry. These strategic objectives address key factors influencing digitalisation, such as interoperability, cybersecurity, workforce readiness, and affordability of digital technologies. They provide clear pathways to overcome challenges, enable adoption, and measure progress. For instance, the software pillar can be used to promote the objective of standardising data and ensuring interoperability.

Each objective is supported by more specific and detailed “strategic directions” available in the technical paper referenced above.

Indicators

This project identified tangible, easily tracked measures that stakeholders could use (see Annex C). They were defined as predominantly quantitative measures.

Indicators can evaluate and guide the implementation of this framework. They provide evidence on increased digitalisation of the sector, demonstrating the benefits of a more coordinated approach.

Several tools that can assist in implementing and evaluating the progress of digitisation:

a) Digital maturity model (see discussion on page 8).

b) The typology of technologies (see discussion on page 11) can be used to identify complementary technologies that can be integrated to enhance overall system efficiency and effectiveness.

c) b) Drivers and barriers (see discussion on page 15) can be used to assess enabling and challenging behaviours and policies of digitisation.

Governance and stakeholders

The DigiCon Framework outlines the roles of key governance levels of these stakeholders, allowing responsibility for digitisation to be appropriately identified.

Table 2 | Roles of key governance levels in policy development

GOVERNANCE LEVEL	KEY RESPONSIBILITIES
Federal Government	Establish national vision, standards, and funding incentives for digital transformation.
State Government	Develop and implement sector-specific digital strategies, monitor progress, and coordinate regional innovation.
Local Government	Integrate digital tools into planning, approvals, and compliance systems.
Industry and professional bodies	Lead implementation, upskill the workforce, and align practice with policy.

Annex D maps these governance levels to the corresponding strategic directions for developing digitalisation policies.

A policy agenda for NSW

The DigiCon Policy Directions Framework provides a practical, evidence-based roadmap to guide digital transformation across the NSW construction sector, complementing the recently launched NSW Infrastructure Digitalisation and Data Policy. The framework serves as a policy implementation toolkit, offering a suite of measures to assess the performance of digitalisation initiatives.

The following six policy recommendations emerge from the Framework's findings. Together, they provide a coherent pathway for government and industry to advance digital transformation through coordinated leadership, capacity-building, and innovation.

1 Establish a national coordinating body for digital transformation in construction

Australia has a significant opportunity to strengthen leadership and coordination in driving digital transformation across the construction sector. A national coordinating body could align digital strategies across jurisdictions, harmonise standards, and foster collaboration between government, industry, and research.

By providing strategic direction and monitoring progress, such an entity would enable more consistent policy implementation, reduce duplication, and accelerate innovation. This coordinated approach would unlock efficiencies, enhance data-driven decision-making, and position Australia's construction sector as a global leader in digital transformation.

2 Promote the adoption of open standards and interoperability

There is a significant opportunity to enhance productivity and collaboration by adopting open standards and interoperable systems. Encouraging industry to adopt and implement globally recognised standards such as ISO 19650 and IFC-based BIM (Industry Foundation Classes-based Building Information Modelling) environments would enable seamless information exchange across platforms and stakeholders. Promoting the use of common data environments (CDEs) and shared digital platforms would ensure greater data integrity, reduce duplication, and improve coordination across the construction lifecycle. Strengthening interoperability will build a more connected, transparent, and efficient construction ecosystem.

3 Embed digital deliverables in public sector procurement and contracts

Embedding digital deliverables in government procurement and contract processes presents a powerful opportunity to make digital transformation part of standard practice. By requiring digital outputs such as BIM models, digital dashboards, and digital twin deliverables within tender and contract documentation, government and industry can drive consistent digital adoption. This approach embeds transparency, accountability, and performance monitoring into every project, ensuring that digitalisation becomes integral to governance and lifecycle management rather than an optional enhancement.

4 Build workforce competence and support SMEs

Developing a digitally capable workforce is key to sustaining innovation and productivity. Establishing national training and certification programs would build digital competencies across all levels, from tertiary education to professional upskilling. Supporting SMEs through tailored training, funding incentives, and access to digital tools would promote more equitable participation in the digital economy. By investing in people, Australia can foster a culture of continuous learning and ensure the construction workforce is equipped to harness emerging technologies effectively.

5 Extend digitalisation across the asset lifecycle

Extending digitalisation beyond design and construction to cover the entire asset lifecycle offers significant efficiency and sustainability gains. Adopting consistent data management and digital asset standards would enable the seamless flow of information from planning and design through to operation, maintenance, and renewal. This lifecycle approach improves asset performance, supports evidence-based decision making, and ensures long-term value creation. A whole-of-life digital perspective positions the construction sector to deliver more sustainable and resilient infrastructure for communities.

6 Stimulate innovation through incentives and research and development support

There is a strong opportunity to strengthen Australia's competitiveness by expanding research, development, and innovation initiatives in digital construction. The study found that greater investment and coordination in R&D are essential to accelerate digital transformation and support technology adoption across the sector.

The ongoing Government Strategic Examination of Research and Development (Department of Industry, Science and Resources) highlights the importance of aligning R&D policy with emerging national priorities, including digital transformation. Integrating construction digitalisation within this broader R&D reform presents a timely opportunity to ensure the sector benefits from innovation-driven growth.

Targeted financial incentives, collaborative grants, and pilot programs focused on digital technologies such as AI, robotics, automation, and digital fabrication would encourage experimentation, strengthen industry–research partnerships, and generate measurable innovation outcomes. Enhanced R&D investment will enable continuous technological advancement and position Australia's construction sector as a leader in digital innovation and productivity.

Collectively, these six agenda items represent an integrated policy direction for digital transformation in NSW's construction sector. The DigiCon Policy Directions Framework provides the structure, measurable indicators, and governance pathways to design and operationalise them, ensuring that policy actions are coordinated, evidence-based, and aligned with the broader goals of productivity, sustainability, and resilience.

Conclusion

The research highlights that, despite the recognised benefits of digitalisation, adoption within the Australian construction sector remains fragmented and slow. Barriers such as policy gaps, inconsistent standards, high implementation costs, and workforce skill shortages continue to limit progress. The recently introduced NSW Infrastructure Digitalisation and Data Policy provides a valuable overarching direction for infrastructure digitalisation across NSW.

This study complements that policy by offering a structured, evidence-based framework that can support consistent policy development and evaluation within the construction sector. The DigiCon Policy Directions Framework and policy opportunities outlined above can guide the structured formulation, evaluation, and implementation of digitalisation policies for the construction sector in New South Wales. The framework addresses the critical dimensions of digital transformation through the following key components: vision and mission, digital pillars, strategic objectives and strategic directions, performance indicators, governance roles, and stakeholder engagement.

The policy opportunities outlined above will help drive forward momentum on digitalisation in the construction sector. Aligned with the policy cycle, the framework can be applied at multiple stages from agenda setting and policy design to implementation and review, serving as both a development tool for designing new, outcome-oriented policies and an evaluation benchmark for assessing whether existing or proposed initiatives effectively address strategic objectives, digital pillars, and performance indicators essential for successful digital transformation.

By utilising the framework within ongoing digitalisation efforts and aligning it with emerging policy directions such as the NSW Infrastructure Digitalisation and Data Policy, decision-makers can enhance digital readiness, accelerate technology adoption, and drive the construction sector toward a more innovative, productive, and future-ready industry.

Annex A: Digital maturity model

Table 4 | Construction Sector Digital Maturity Characteristics

STAGE	DESCRIPTION	KEY CHARACTERISTICS
Stage 1: Basic Digitalisation	Use basic technologies such as connectivity to the internet, having a website, and using email to improve business operations	1. Having dedicated broadband access for work 2. Having a website representing the activities of the organisation 3. Using email to communicate with stakeholders regarding work-related matters 4. Having subscribed to social media platforms as a business entity 5. Storing data locally 6. Designers: Use of primarily CAD-based software for design development 7. Builders: Use of spreadsheets and similar basic software 8. Builders: Obtaining quotations via telephone 9. No formal training with regard to new digital capabilities 10. No investment in research & development 11. ICT investment is less than 1% of the organisation's turnover
Stage 2: Advanced Digitalisation	Use of technology in advanced ways to improve their operations	In addition to Stage 1, 1. Use of social media data analytics 2. Use of SaaS platforms or dedicated e-commerce platforms for procurement of goods and services 3. Use of multi-party collaboration and communication tools (eg: MS Teams, Zoom, Slack) 4. Storing data in the cloud 5. Designers: Use of BIM 6. Designers: Use of software for rendering and advanced design analytics (sustainability, shading etc) 7. Builders: Use of specialised software for scheduling and estimating 8. Builders: Obtaining quotations and submitting bids online 9. Builders: Online connectivity to the construction sites 10. Builders: Use of software onsite 11. Builders: Use of digital devices onsite for data collection and management of operations 12. Builders: Basic use of IoT devices (RFID tagging, different types of sensors etc) 13. Builders: Use of big data analytics on data collected from IoT devices 14. Builders: Use of coordinated design and manufacturing techniques for construction (eg: DfMA) 15. Ad-hoc training with regard to new digital capabilities 16. Investment in research & development (R&D) is less than 1% of the organisation's turnover 17. ICT investment is between 1% to 3% of the organisation's turnover

STAGE	DESCRIPTION	KEY CHARACTERISTICS
Stage 3: Smart Digitalisation	Integrated use of digital technologies such as online platforms and automated supply chain management	In addition to Stage 2, 1. Use of benchmarking/ dynamic feedback on performance metrics 2. Use of LiDAR scanning techniques, drones 3. Internally or externally managed network enabling data sharing and communication 4. Use of specific software for supply chain management and logistics 5. Use of software for modelling business processes 6. Use of AR, VR and MR techniques for design analysis and building construction and maintenance 7. Designers: Use of software for parametric modelling and advanced analysis 8. Designers: Use of intelligent BIM (More advanced and integrated with automated clash detection and compliance checking) 9. Builders: Use of overall construction project management systems with Enterprise Resource Planning (ERP) features 10. Builders: Use of ERP-integrated electronic portals to obtain and analyse quotations 11. Builders: Advanced and integrated use of IoT with buildings and structures 12. Builders: Use of simple robotics tools and exoskeletons 13. Structured external training programs with regard to new digital capabilities 14. Investment in research & development (R&D) is between 1% to 3% of the organisation's turnover 15. ICT investment is between 3% to 5% of the organisation's turnover
Stage 4: Transformative Digitalisation	Digital technologies and management capability enabling business transformation such as digital assets, create new business models	In addition to Stage 3, 1. Use of fully integrated, tailor-made ERP system for the entire organisation with high level of cloud integration. 2. Use of advanced cyber-physical systems for building operation and management 3. Corporate vision for digitally integrated design and construction 4. Use of Advanced digital assets that dynamically represent the physical environment 5. Research and development investments focused on business transformation 6. Digital investments are well managed with a strong unifying vision, governance and corporate digital culture that can envision further changes and implement them wisely. 7. Builders: Extensive use of robots for on-site construction 8. Builders: Obtain full e-procurement from a Software as a Service (SaaS) provider 9. Greater level of integrated design and industrialised construction in controlled environments 10. Structured internal training programs with regard to new digital capabilities 11. Investment in research & development (R&D) is more than 3% of the organisation's turnover 12. ICT investment is more than 5% of the organisation's turnover

Annex B: Typology of digital construction technologies

This matrix translates the survey's headline signals into policy moves. It pairs each insight with concise evidence and a corresponding action so decision-makers can prioritise near-term reforms across approvals, finance, procurement, assurance, skills and market confidence.

TECHNOLOGY GROUP	DESCRIPTION	TYPICAL TECHNOLOGIES EXAMPLE
Data Capturing Technologies	Tools and systems that collect raw information from the physical environment or humans and convert it into digital formats for processing	Wearable technologies, Software applications; Robotics and automation, Blockchain and smart contracts, Distributed architectures, Artificial Intelligence, Data analytics; Big data.
Data Communication Technologies	Technologies that enable the transfer of data between devices, systems, and stakeholders across physical or cloud networks	Software applications, Cybersecurity solutions, Blockchain and smart contracts, Digital twins; BIM, Image capturing technologies.
Data Storage Technologies	Technologies that provide secure, scalable, and accessible systems to store and retrieve information	Blockchain and distributed architectures, data analytics and big data; Digital twins, Image capturing technologies.
Data Analysis Technologies	Technologies which process and interpret data to extract meaningful insights and support decision-making	Software applications, Simulation and visualisation tools, 3D printing, Robotics and automation, Blockchain and smart contracts, AI; IoT and sensors, Data analytics and big data, Digital twins.
Data Visualisation Technologies	Technologies which transform data into graphical and interactive formats for easier understanding and communication.	Wearable technologies, Software applications, IoT and sensors, Data analytics and big data, Digital twins.

* Results are reported as percentages from a 1–5 Likert scale, where 1 = strongly disagree and 5 = strongly agree.

Annex C: Measures for tracking progress

Table 3 | Measurements and measures for tracking progress against strategic objectives

STRATEGIC OBJECTIVES	MEASUREMENT	MEASURES
SO1: Increase Digital Technology Adoption	Track adoption through periodic industry surveys and certification records.	• Percentage of firms adopting at least one new digital technology annually • Number of projects utilising BIM, digital twins, IoT, or similar tools • Growth rate in digital tool/software licenses issued in the sector • Reported digital maturity levels (Digital Maturity Index)
SO2: Enhance Workforce Digital Competencies	Use training completion certificates and digital competency assessments.	• Percentage of workforce completing accredited digital skills certification • Number of digital upskilling and reskilling programs conducted • Average training hours per worker on digital technologies • Employer-reported improvements in digital proficiency
SO3: Expand Digital Infrastructure	Monitor infrastructure rollout through audits and connectivity reports.	• Percentage of construction sites with high-speed connectivity • Number of digital infrastructure upgrades completed (e.g. sensors, cloud systems) • Level of investment in construction-specific digital infrastructure • Proportion of regional projects with digital connectivity enabled
SO4: Standardise Data and Ensure Interoperability	Evaluate compliance through audits and industry self-reporting.	• Percentage of projects using standardised data formats (e.g. IFC for BIM) • Compliance rate with national or international digital standards • Number of interoperability issues identified and resolved • Number of organisations adopting shared digital platforms
SO5: Strengthen Cybersecurity in Digital Systems	Track cybersecurity practices through audits and incident reporting.	• Percentage of firms implementing cybersecurity frameworks (e.g. ISO 27001) • Number and trend of reported cybersecurity incidents • Percentage of platforms undergoing regular cybersecurity audits • Average time to detect and respond to cyber incidents

STRATEGIC OBJECTIVES	MEASUREMENT	MEASURES
SO6: Boost Investment in Digital R&D and Innovation	Monitor investment levels, patent filings, and research outputs.	• Annual investment in digital R&D in construction • Number of new digital construction technologies piloted • Number of industry–academic research collaborations formed • Percentage increase in digital construction patents or innovations
SO7: Leverage Digital Platforms for Governance and Decision-Making	Assess platform integration through implementation reports and stakeholder feedback.	• Percentage of projects using digital platforms for governance and reporting • Number of project milestones managed via digital dashboards or BIM • Reduction in governance delays through automated workflows • Number of organisations standardising governance processes digitally
SO8: Drive Sustainable Development Goals (SDGs) through Digitalisation	Track the impact of digital tools on sustainability performance.	• Percentage of projects optimising energy and resource use through digital tools • Number of projects achieving green certification supported by digital modelling • Reduction in carbon footprint linked to digital practices • Number of SDG-aligned digital innovations implemented
Super Measures (Cross-Cutting Indicators)	Assess overall sectoral performance improvement.	• Reduction in average project delivery times • Reduction in rework and errors through digital processes • Improvement in cost predictability (projects completed within budget) • Productivity growth rate in digitally enabled projects

Annex D: Governance levels mapped to strategic directions

Table 5 | Mapping of the governance levels to strategic directions

STRATEGIC OBJECTIVES (SO)	
SO1	Increase digital technology adoption
SO2	Enhance workforce digital competencies
SO3	Expand digital infrastructure
SO4	Standardise data and ensure interoperability
SO5	Strengthen cybersecurity in digital systems
SO6	Boost investment in digital R&D and innovation
SO7	Leverage digital platforms for project governance
SO8	Drive achievement of Sustainable Development Goals

PILLAR	CODE	STRATEGIC DIRECTIONS (STD)	STRATEGIC OBJECTIVES							
			SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8
P1 Software	SD1	Promote the adoption of globally accepted data standards to enhance interoperability among different systems.				FG				
	SD2	Encourage incentives, grants and investment in R&D in developing smart and innovative digital solutions.						SG		
	SD3	Establish standards to enhance interoperability across government platforms.				SG			SG	
	SD4	Consider means of improving affordability of software licensing especially for micro-SME (majority) enterprises.	SG							
	SD5	Encourage the development of innovative digitally enhanced, accessible, processes and solutions to improve efficiency.	SG						SG	
	SD6	Leverage digital platforms to streamline communication, knowledge sharing, and project governance.							SG	
	SD7	Promote the adoption of software for advanced data management enhancing management of construction projects and procurement.	SG							
	SD8	Develop digitalisation approaches that adopt ethical practices and achieve Sustainable Development Goals.	FG							

PILLAR	CODE	STRATEGIC DIRECTIONS (STD)	STRATEGIC OBJECTIVES							
			SO1	SO2	SO3	SO4	SO5	SO6	SO7	SO8
P2 Hardware	SD9	Establish data governance frameworks to enhance the management of complex construction data requirements.				FG			SG	
	SD10	Improve life cycle affordability of hardware required for digitalisation.	FG							
	SD11	Encourage hybrid cloud integration and optimisation of in-house data storage.	IN			SG				
P3 Liveware (People)	SD12	Encourage the propagation of digital competencies through educational and competency development programs.		SG						SG
	SD13	Promote the adoption of universal digital platforms to enable safe, trustworthy stakeholder collaboration and real-time data sharing.				SG			SG	
	SD14	Promote and incentivise digital skill development programmes at industry and tertiary education levels.		SG						SG
	SD15	Promote public awareness of and demonstrate true benefits of digitalisation of the construction sector.	SG							SG
	SD16	Stimulate building client-driven demand for digitalisation through appropriate digital mandates.	FG							
	SD17	Strengthen government-industry-academia partnerships in education, training, and research.						FG		
P4 Digital infrastructure	SD18	Develop guidelines and standards to facilitate the establishment of CDE for the management of data in construction projects.			FG	FG			FG	
	SD19	Promote the adoption of cybersecurity, advanced data protection and data privacy standards across the industry.			SG		FG			
	SD20	Develop and expand both wired and wireless broadband infrastructure to facilitate efficient data communication between construction sites and stakeholders.			SG					SG

KEY **IN** Industry **SG** State Government **FG** Federal Government

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