APPLIED

Australian Academy of
Technology & Engineering

ACTION STATEMENT
November 2018

Positioning Australia as a leading digital nation

Digital technologies are key drivers of economic and societal success. Their development and uptake are accelerating at an unprecedented rate across the globe. Australia must ensure its digital future by playing a leading role in the development of digital technology and its application in business, industry, government and society.

The rapidly expanding and evolving digital world

Digital technology has resulted in a highly dynamic, evolving transformation that touches all aspects of our lives. It provides new concepts, capabilities and business models not possible through other means. Governments, organisations, businesses and individuals now communicate, collaborate, and provide or use services based on digital technology. The tyranny of distance is rapidly diminishing and terms such as e-commerce, e-health and e-learning are now part of the general lexicon. The Internet of Things (IoT) and big data, coupled with rapid progress in artificial intelligence and broadband systems is resulting in a very different world, including: the way we create, use and store knowledge; a greatly increased presence of autonomous systems; and the emergence of smart cities.

The global appetite for digital technologies and the rate of uptake is a significant opportunity to establish new commercial enterprises in digital technology supply and digital service provision, and to grow and improve the productivity of existing industries in all sectors. The digital innovation environment is dynamic and complex, and time-to-market is typically very short. Australia must be agile in seizing opportunities, both in progressing and transitioning digital technology to new products, and in adapting business models to make full use of digital transformation.

Our digital futures environment

Digital technologies are already impacting important national capabilities such as emergency management and advanced environmental management solutions. Similarly, a number of Australian business areas are successfully using digital technologies to improve productivity, including in the agriculture, health, mining, materials and logistics industries. There are new businesses emerging in the provision of digital technology solutions and services in areas such as global logistics, infrastructure, and energy resources.

Space technologies in particular represent a unique and important opportunity as our space and digital futures are mutually reliant - space capabilities will strongly leverage digital technology and in return will provide vital services for a digital future.

The Australian Government is addressing the strategic environment for our digital future through development of the Digital Economy Strategy, the formation of the Prime Minister's Industry 4.0 Taskforce and the release of Australia's Cyber Security Strategy.

Australia has strong research capabilities in the technologies central to shaping the digital future including artificial intelligence, data analytics, machine learning, and fixed and mobile broadband systems. The importance of our digital research in supporting our technology development is canvassed in the report "Technology and Australia's Future" produced by the Australian Council of Learned Academies (ACOLA).

Challenges for the future

Australia faces a number of diverse challenges to be internationally competitive in the digital age. In particular we must develop a legislative framework that ensures safety and security whilst encouraging innovation. Equally we must develop a globally respected means to operate efficiently and effectively in the digital world, including having a skilled digital workforce, modern digital infrastructure and world-class cyber resilience. These are critical for domestic business but also for encouraging global investment.

Australia must improve its level of digital technology readiness including improving national digital literacy and encouraging business, industry and government leaders to think more strategically about, and plan for, digital technology uptake.

Collaboration lies at the heart of successful digital innovation. Australia ranks in the bottom half of the OECD index for collaboration. To drive the Australian digital technology products and services industry base, strategies should be developed to improve peer-to-peer collaboration and grow partnerships between researchers, industry and end users.

A key challenge will be in maintaining global competitiveness in pivotal research areas such as big data, cloud storage, artificial intelligence, robotics, quantum technology, broadband, IoT, and cyber resilience, where other nations are investing heavily, through both industry and government funding.

The way forward

The Academy will engage with industry bodies and government agencies to advocate for the following recommendations:

Accelerate digital transformation

Recommendation 1: Australia must strengthen its strategic framework to accelerate digital transformation within government, industry and society.

1.1 Strategic Planning: Encourage businesses, government agencies and other organisations to develop technology roadmaps and implement strategic plans with an associated two-yearly bench marking process for digital transformation and innovation.

1.2 Legislative Support: A national plan should be established to develop safety, security and interoperability regulatory frameworks and standards for new digital technologies such as IoT, AI and autonomous systems. A multi-disciplinary expert group should be established to guide this initiative. Particular attention should be given to safety-critical, health, and Supervisory Control and Data Acquisition (SCADA) systems. Any such legislation needs to ensure that the legislative framework does not stifle innovation, but does provide a clear framework in which it can operate.

1.3 Digital Skills: Industry, government, educational and technology leaders should work together to produce a decadal plan to develop and sustain a skilled digital workforce, identifying digital skills needs and the role of schools, tertiary education, VET programs, industry exchange programs, Massive Open On-Line Courses (MOOCs) and digital badges[1].

1.4 Data as a Precious Resource. A National Data Security plan should be developed to provide guidance on policies, procedures and technologies for ensuring the appropriate availability, privacy, and integrity of all data types, including personal, business, health, emergency services, sensor, geospatial, and geolocation and timing data.

Drive the digital ecosystem

Recommendation 2: Australia must expand its digital ecosystem by investing in key projects, developing critical digital infrastructure and encouraging collaboration.

2.1 Key National Projects: Promote alliances that allow more rapid development and deployment of digital technologies in key national projects. In particular, Australia's new initiative in space could be the focus of this given the strong mutual reliance between space and our digital future.

2.2 Digital Infrastructure Planning: The government should lead the development of a plan for the on-going systematic development and upgrade of Australia's digital network infrastructure based on technology, systems and use analysis.

2.3 Collaborative Relationships: Industry and research organisation leaders should jointly commit to improving peer-to-peer and technology developer to end-user engagement through arrangements that include access to facilities, staff exchanges, and partnering on major procurement projects, particularly defence projects. Governments need to carefully consider instruments which will provide incentives to both industry and academia to stimulate engagement.

Boost our digital capabilities

Recommendation 3: Australia should both strengthen and better leverage its research and development of digital technologies.

3.1 Strengthen R&D Capabilities and Access: In line with other leading digital nations, Australia should commit to increasing investment by government and industry in research centres with world-class expertise in digital technologies. Access to these centres should be facilitated by online information and collaboration services.

A primary goal of digital research should be the demonstration of the potential benefits of emerging technologies such as artificial intelligence, data analytics, cloud computing and IoT, while addressing concerns about safety, security and privacy.

3.2 Technology Ambassadors: Technology leaders should promote greater industry investment in R&D by undertaking assessments of the opportunities for digital technologies to impact and disrupt key Australian industry sectors.

3.3 Cyber Resilience National Research: An expert group should be formed to develop a cyber resilience national research plan. This plan should be focused on developing techniques and technologies for achieving cyber resilience, and on providing guidance to policies and plans for the cyber resilience of Australian businesses, organisations and critical infrastructure.

Many of these recommendations represent calls to action. The mechanisms by which the actions can best be achieved will be a matter for collaborative planning and agreement by governments, industry organisations and/or research agencies. This may need to involve the establishment of an expert advisory group reporting directly to senior Ministers (including industry, science and finance). The advisory group members must themselves be respected leaders in their field of expertise. The Academy is committed to Australia's digital future and stands ready to contribute its expertise to assist if requested to do so.

1. Digital Badges are a validated indicator of accomplishment, skill, quality or interest that can be earned in various learning environments.

GPO BOX 4055
Melbourne, 3001
VIC, Australia

T +61 3 9864 0900
F +61 3 9860 0930
E info@applied.org.au

applied.org.au