



Australian Government

# DIGITAL ECONOMY STRATEGY 2030







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# DIGITAL ECONOMY STRATEGY

A leading digital economy  
and society by 2030

## DIGITAL ECONOMY STRATEGY 2030

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978-1-925364-56-9 - Digital Economy Strategy 2030 (online)  
978-1-925364-57-6 - Digital Economy Strategy 2030 (print)

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# FOREWORD

Australia's future prosperity depends on the policy environment created now to help boost productivity, increase access to secure infrastructure, support emerging industries and technologies, and ensure fit-for-purpose regulatory frameworks are in place.

Over the last 18 months we have seen a rapid uptake of digital technologies across our society. It has helped businesses to stay afloat, grow and create new jobs, and it has helped people continue to live their daily lives in new and different ways.

As we emerge from the challenges of the COVID-19 pandemic, a thriving digital economy is critical to Australia's overall economic recovery. Many countries are investing in their digital futures and we must too if we are to ensure Australian businesses remain globally competitive and that Australia retains its position of influence as a global leader.

We are not starting from scratch. Australia has strong foundations to support a growing digital economy. We are early adopters of technology, we are known for our robust regulatory systems and we are a democratic society.

The Australian Government is ambitious about Australia's digital future. Our goal is for Australia to be a world-leading digital economy and society by 2030. What does that look like? In summary, it means thriving high growth industries, all businesses are digital businesses, all Australians have access to digital skills and technology, there is frictionless government service delivery, fit-for-purpose regulation builds trust, and we have integrated data and technologies that make life easier.

The Digital Economy Strategy outlines a cohesive roadmap – encompassing initiatives already underway, investments we are making now to take us forward, and areas to be considered to help us identify opportunities into the future.

The focus is on getting the foundations right, building capability in emerging technologies and lifting our ambition through digital growth priorities.

This is a living strategy. We will continue to track progress towards our 2030 vision and adjust course as we need to, to ensure we are successful in reaching our ambition.



## Senator the Hon Jane Hume

Minister for Superannuation,  
Financial Services and the Digital Economy  
Minister for Women's Economic Security

# DIGITAL ECONOMY STRATEGY

Building a modern and resilient economy to drive Australia's future prosperity

## Our Vision

For Australia to be a leading digital economy and society by 2030

### Delivering the right foundations to grow the digital economy

Digital infrastructure

Cyber security,  
safety and trust

Skills and  
inclusion

Systems and  
regulation

Trade and  
international  
engagement

### Keeping at the forefront of emerging technologies

Artificial  
Intelligence

Internet  
of Things

Data Analytics

Blockchain

Quantum  
Computing

### Lifting our ambition – Digital Growth Priorities



Digital SMEs



Modern industry sectors



Dynamic and emerging  
tech sector



Digital Government  
and services

### Key 2021-22 Budget Initiatives

- **AI investments** to drive greater AI adoption across the economy
- **Emerging Aviation Technology** reforms and industry partnerships to enable the use of drones and other aviation technologies
- **Tax incentives** to grow the digital games sector and encourage business investment in digital technologies
- Accelerating the rollout of the **Consumer Data Right** giving Australians greater access to, and control over, their data
- Unlocking the value of data with an **Australian Data Strategy**
- Building skills for a modern economy with a **Digital Skills Cadetship Trial** and **Next Generation AI and Emerging Technology Graduates**
- **Enhancing myGov** to deliver better services to Australians
- Enabling **next-wave My Health Record** for world-leading healthcare
- Expanding the use of the **Digital Identity System** for secure and simple access to services from government and across the economy
- Expansion of **Digital Solutions - Australian Small Business Advisory Services** to build SME digital capability
- Improving **internet and mobile connectivity** in peri-urban areas
- Driving the uptake of **e-Invoicing** by businesses
- Working with industry to **secure Australia's mobile networks** (5G and future 6G networks) and data centre infrastructure
- **Digital Atlas** to support emergency response, environmental management, virtual construction design and business investment

### We'll be succeeding when

100% of Australian Government services are available online

Digitally-intensive industries employ more than 10% of the Australian workforce

All Australian businesses continue to improve cyber security practices

Tertiary advanced digitally skilled graduates increase to more than 15,000 per year

All new businesses are 'born' digital

95% of SMEs are using e-Commerce tools

# EXECUTIVE SUMMARY

How well our businesses, governments and workforce keep pace with changes in technology and the digital frontier will define Australia's future prosperity. The potential benefits to the Australian economy through digitalisation have been estimated to be as much as \$315 billion over the next decade, with the potential to create up to a quarter of a million new jobs by 2025.<sup>1</sup> With other countries investing heavily in their digital futures, our actions over the next 10 years will determine whether we lead or fall behind our global competitors.

COVID-19 accelerated the take up of digital technology and highlighted the role it can play to support and enhance business operations across every sector of the economy, improve the delivery of government services and make life easier for Australians. From telehealth and electronic prescriptions to online sales, cloud computing and remote working, COVID-19 has driven a huge leap forward in our digital capability and our appetite for data. Australia must maintain this momentum to secure our future prosperity and protect our national interests.

**The Digital Economy Strategy sets out how Australia will secure its future as a modern and leading digital economy and society by 2030.** It builds on the Australian Government's existing digital and data initiatives, sets out further actions the Government is taking through the 2021-22 Budget and defines future pathways to 2030.

The Strategy recognises that the Government plays an enabling role – Australian businesses and individuals will ultimately determine our success. The Strategy is built around three pillars:

1. **Building the foundations to grow the digital economy** – The first role of government is to create the policy settings for the digital economy to flourish. This includes investing in digital infrastructure, a skilled workforce, digital inclusion, digital trade agreements, cyber security and safety, and world-class systems and regulation that encourage the adoption and creation of trusted digital technology.
2. **Building capability in emerging technologies** – The Government recognises the important role of emerging technologies in driving future productivity and prosperity. It is developing its understanding of these technologies so it can build capability and keep pace with changes in technology to position Australia at the forefront of technology development and use.
3. **Setting Digital Growth Priorities to lift our ambition** – The Government has identified four strategic priorities across the economy where we can partner with the private sector to drive digital growth, jobs and capability. These priorities include lifting the digital capability of small to medium enterprises (SMEs); supporting modern and globally competitive industry sectors in areas like manufacturing, agriculture, mining and construction; building a dynamic and emerging technology sector; and delivering simple and secure digital government services.

The 2021-22 Budget supports the Digital Economy Strategy through \$1.2 billion in strategic investments to unlock the value of data, drive investment and uptake of emerging technologies, build the skills required for a modern economy, and enhance government service delivery. This builds on the \$800 million Digital Business Plan, the \$1.67 billion Cyber Security Strategy 2020, the \$1 billion JobTrainer fund and the \$4.5 billion upgrade plan for the NBN. These investments will drive greater productivity, high-quality jobs, and income growth across the economy.

But our action and investment won't stop there. The Digital Economy Strategy sets out the pathways to guide future actions, set ambitious targets and will be continually renewed to realise our vision of being a leading digital economy and society by 2030.

# AUSTRALIA - A WORLD LEADING MODERN, DIGITAL ECONOMY

Australia is part of an increasingly interconnected global economy where the online world is rapidly changing the economic and social landscape. Business models are changing – they can deliver tailored goods and services to be accessed by consumers and business anywhere, anytime. This creates new global markets for innovative Australian businesses, while also introducing greater competition to our domestic economy. Digital technology is also driving a re-evaluation of data, transforming it into an asset that can be used to deliver better outcomes for Australians.

COVID-19 changed the way Australians engaged with digital technologies. Estimates suggest that Australia vaulted five years forward in consumer and business digital adoption in around two months.<sup>2</sup> Almost 9 in 10 Australian businesses adopted new technologies during COVID-19 to support business continuity while Australians took to online shopping, working from home and social engagement as never seen before.<sup>3</sup>

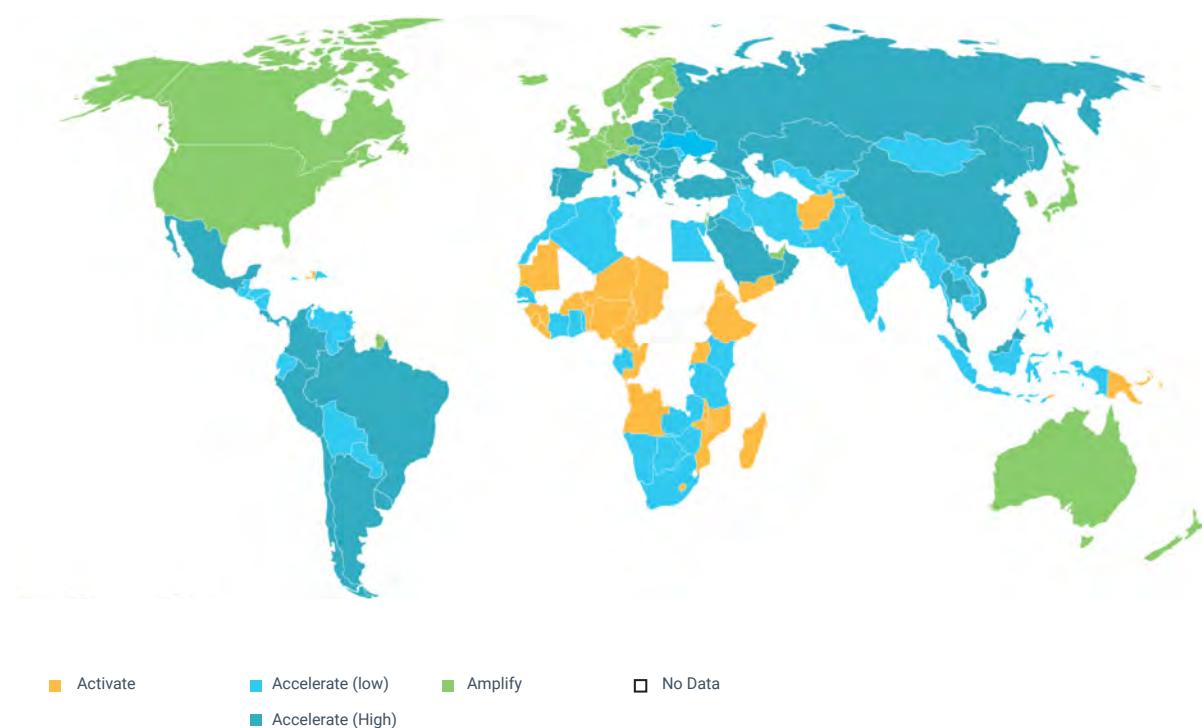
During the past 12 months, many Australian businesses introduced new ways of working and leveraged digital technologies to change what they offered and how it was delivered. Businesses that engaged in e-Commerce were the most resilient and adaptable to the shock of the pandemic, and catalysed other businesses to digitise their operations. Australia needs to maintain this momentum to secure our future prosperity. Increased digital uptake will support improvements in living standards, ensure we remain globally competitive and are well positioned to protect our interests. Greater adoption of digital technology in a secure and trusted way will be a key driver of higher productivity, wages and employment growth.

Even before COVID-19, Australia had sound foundations that made us well-placed to be a leading digital economy. We are a democratic nation, with high levels of internet connectivity, and Australians are well-educated and keen adopters of new technology. Australia is an attractive place to live and do business and we are leading the world to make sure that digital technology is fair, safe and trusted through initiatives like the world-first Office of the eSafety Commissioner.

These fundamentals position Australia internationally as a country ready to increase its digitalisation (Figure 1). Among 141 countries assessed for digital readiness using seven indicators, Australia was in the top 20. However, this is a ‘never-ending journey’ and even leading countries face a constant need to develop their digital readiness to remain competitive relative to their peers and keep ahead of up-and-coming nations that desire to take a leading position.

Figure 1

### Australia compared to the world - digital readiness



Reproduced with permission: CISCO (2020) *Digital Readiness Index*

A range of sectors and businesses are already leading the world in technology development and adoption. A key objective of the Digital Economy Strategy is for as many Australian businesses as possible to be operating at the digital frontier in their sectors, and we can already see this in some sectors of our economy such as mining, agriculture and health. To achieve this objective, a thriving digital technology sector will be essential for supplying the skills needed to uplift digital capability across the economy.

## Case study

### LEADING THE WORLD IN APPLYING AI FOR MINING

LAB<sup>3</sup> Lumen assisted a large mining company looking to reduce its costs by using SensorMine® to extend tyre life. SensorMine® enables analytics of real-time data that assists with predictive maintenance and improves operational performance.

SensorMine® was installed on truck tyres to collect real-time vibration data, allowing the client to monitor and identify harsh terrain. This enabled them to analyse and roll-out alternative routes that will reduce wear and maximise tyre life.

Mine sites implementing LAB<sup>3</sup>'s SensorMine® solution could reduce tyre costs by an estimated 4 per cent. With tyre costs representing one of the top four costs in the sector, the solution has the potential to deliver real industry impact and improve competitiveness. Founded in 2017, LAB<sup>3</sup> has grown to more than 150 ICT professionals. LAB<sup>3</sup>'s growth has been powered by a unique blend of exceptional engineering talent coupled with a thirst for developing dynamic professionals entering the sector.

With the help of government grants, graduate programs and industry partnerships, LAB<sup>3</sup> has invested over \$5 million in its research and development (R&D) activities, creating 30 full time jobs and enabling LAB<sup>3</sup>'s intellectual property and products to be sold in numerous international markets, including the US, Japan, Canada and the EU.



## **Other key areas where we are already building our capability include:**

**Skills:** The Australian Government has made significant investments in education and training that will help Australians to lift their digital capabilities in the workforce. Digital skills are increasingly part of every job. The Government's JobTrainer program, Boosting Apprenticeships Commencements, and Job-ready Graduates initiatives are helping to provide Australians with the skills our businesses need. We have also elevated digital skills alongside language, literacy and numeracy for job seekers as a foundational skill.

**Regulation:** To ensure that businesses have the confidence to invest and actively participate in the digital economy, regulation needs to be clear, proportionate and fit-for-purpose. The digital economy also requires a different mindset for regulation. Modernising regulation – whether competition, consumer protection, safety or security – requires smart regulatory design. It must support new economic opportunities while safeguarding the rights of individuals and deliver broader public benefit.

Australia has undertaken world-leading investigations to ensure our competition rules remain up to date through the Digital Platforms Inquiry and the related examination of our privacy laws. We are the first country to create and enact a digital trade agreement featuring modernised digital trade rules (with Singapore), and the first to establish an eSafety Commissioner to make sure that Australians are protected online. Australia's Consumer Data Right is also becoming a world leading consumer-driven data sharing framework that will give Australians more control over their data while boosting innovation and competition.

**Cyber security:** Businesses and people will only embrace digital opportunities to the maximum extent if they are confident that they can trust the technologies and the identity of the people and businesses they interact with online. Cyber security risks have a significant economic cost, estimated to be as much as \$29 billion per year. Central to realising the benefits of the digital economy is continuing to position Australia as a world-leader in online safety and trusted technology, which we are doing through the \$1.67 billion Cyber Security Strategy 2020.

Safety and security does not mean stifling innovation or trading off broader digital opportunities. On the contrary, it can actually open the door for Australia to create new economic opportunities by carving out a market for safe and trusted digital products and services.

While we are starting from a solid base, there is significant room to grow.

Australia ranks well internationally on many facets of digitalisation (Figure 2), and recent investments will maintain and/or lift our competitiveness. However, there are challenges still to be met, including increasing adoption of technology across the economy, particularly by SMEs; maintaining and growing a skilled workforce; and stimulating greater development and adoption of technologies to meet Australia's specific needs.

The ICT sector is a relatively small share of Australia's economy, reflecting the relative size of other sectors, such as mining, agriculture and construction. However, we rank highly in the application of digital technologies across the economy, skills, digital government, data and cyber security. In all areas there is potential for further improvements to reach the level of current leaders and significant investment is required to maintain this leadership into the future.

Figure 2

## Australia compared to similar economies – selected indices

Rank	% of ICT Gross Value Added (OECD 2021) <sup>4</sup>	Digital Economy Indicators		Skills and Capabilities		Digital Government		Online Security	
		Digital-intensive sectors' share in total employment (OECD 2016) <sup>5</sup>	Share of small businesses making e-commerce sales in the last 12 months (OECD 2020) <sup>6</sup>	Share of Internet users who have purchased online in the last 12 months (OECD 2020) <sup>7</sup>	% tertiary ICT graduates (OECD 2018) <sup>8</sup>	Inclusive Internet Index - Overall (EU 2021) <sup>9</sup>	eGovernment Development (UN 2020) <sup>10</sup>	Publication of Open Government Data (Open Knowledge Foundation 2017) <sup>12</sup>	Global Cybersecurity Index - Country Commitment Levels (ITU 2018) <sup>13</sup>
1				UK	UK				
2	ISRAEL				AUSTRALIA	USA		UK	USA
3								UK	
4		USA			AUSTRALIA	UK			
5						AUSTRALIA	USA		
6	USA						CANADA	SINGAPORE	
7		UK			AUSTRALIA	UK			
8	UK		CANADA	CANADA		CANADA		MALAYSIA	
9					AUSTRALIA	UK	USA	CANADA	
10						JAPAN	USA		AUSTRALIA
11				CANADA					
12			JAPAN				SINGAPORE		
13						USA			
14				UK				JAPAN	
15									
16						ISRAEL	ISRAEL		
17					AUSTRALIA			ISRAEL	
18				JAPAN					
19									
20						USA			
(Lower)	(39)			(26)					

Australia's productivity and economic performance needs to increase if we are to sustain and grow our enviable standard of living. As one of the strongest recovering economies coming through COVID-19, Australia can seize the opportunity to be even stronger and more prepared for a digital future. Unlocking the value of digital technologies will drive a stronger economy and support important social, environmental and health outcomes. Continued rapid advancement in technologies like precision healthcare, low emissions technologies and assistive technologies will be crucial in delivering improved living standards to 2030 and beyond.

The digital economy is dynamic. Technologies will evolve and new technologies will emerge, potentially as revolutionary as the internet and email were at the end of the 20<sup>th</sup> century.

The Digital Economy Strategy will continue to evolve and adapt to these changing circumstances to ensure Australia remains on track to be a leading digital economy.

## What is a digital economy and society?

A digital economy and society includes all activity reliant on, or significantly enhanced by, the use of digital inputs including:

- **technologies:** the tools and products that help us work and in our everyday lives such as smartphones, robotics and automation.
- **infrastructure:** the systems that keep us connected and online such as mobile and fixed phone and broadband services and location-based technologies (like GPS).
- **services:** the processes, culture and business models that enable a user-centric end-to-end service such as digital platforms, software and cloud storage.
- **data:** the basic element that can be processed or produced by a computer to convey information, including the facts, statistics, instructions, concepts, or other information capable of being communicated, analysed or processed by an individual or by other means including a computer, electronic and automated means.
- **regulatory frameworks:** that oversee the efficient, safe and reliable functioning of the digital economy, including the standards that underpin the operation of digital technologies and infrastructure.
- **capabilities and skills:** the application of skills and knowledge that ensures people are able to use digital technologies and participate in society.

All businesses, consumers and government that use and are responsible for these inputs are part of a digital economy and society.

*Source: Based on OECD (Measurement - Organisation for Economic Co-operation and Development ([oecd.org](http://oecd.org)))*

A digital economy is characterised by online transactions and engagement – a virtual, paperless and cashless world. It harnesses a range of technologies, services and business models that improve personalisation through human-centred design and create new opportunities and markets.

Ultimately there will be no distinguishing between the digital economy and the economy as a whole. This means that by 2030:

- All businesses are digital businesses, using e-Commerce tools and new technologies to improve productivity, innovate and generate high-paying jobs.
- All transactions are electronic, integrated and secure - from registration through to employment, reporting, marketing, banking, accounting and security.
- Australians have the capabilities to confidently use and create digital technology, forming the skilled workforce needed to help businesses reach and operate at the digital frontier. All Australians will have learning opportunities to gain the foundational maths and digital skills to give them a head start for future careers across the economy, or upskill on a shared understanding of what is required to gain and advance in employment.
- Government services will all be easily and safely accessible online, saving people and businesses time and money. Government service delivery will be supported by better public data availability and sharing that is used by a highly-skilled public service to deliver more targeted policy and programs.
- Australia leads the world in smart regulation and initiatives to ensure Australia has the safest and most cyber secure environment for Australians living and working online, building trust in the digital economy and opening up new economic opportunities.
- Australia leads the world in areas of technology development that harness our strengths and make life easier for Australians in what they use and do every day. New data-driven businesses are being developed to provide more sophisticated and personalised goods and services, and consumers have greater control over the use of their data.
- Australia is resilient to economic, health and environmental shocks and threats to our national interests with technology enabling business continuity, community safety and swift recovery.

# Technology is changing how we do business

Technology is transforming business models and reducing barriers to growth for small business through affordable access to safe and secure payment systems, forums for collaboration, and reduced technology investment costs through the adoption of multi cloud, hybrid cloud and distributed cloud services. Growth in digital activity has outpaced overall growth in the economy and the affordability of communications services has continued to improve.<sup>14</sup>

The importance of digital technologies to global commerce is reflected in the prominence of technology businesses in the world's largest companies. In 2019, the five largest companies by market capitalisation were Microsoft, Amazon, Apple, Alphabet (Google) and Facebook. Just ten years ago, this list was dominated by industrial companies – General Electric, Exxon, Pfizer and Citi – with Microsoft the only digital business.<sup>15</sup>

Digital platforms allow digital services to operate at scale and are rapidly becoming the new marketplace by playing the role of intermediary between businesses and consumers. However, change in the short term can be difficult with a range of issues associated with, or exacerbated by, their growth: cybercrime, online safety and privacy, market power and competition, and tax and industrial relations issues. The Australian Government has established strong foundations in addressing these issues to date and will continue to pay close attention to these technology trends in the achievement of our digital ambition.

Figure 3

## Trends driven by digital technology

Trends being driven by digital technology	Spotlight: Australia's COVID-19 digital acceleration
 <b>More online interactions</b> between people, businesses and systems that allow for the discovery and sharing of information.	5 The number of years consumer and business adoption moved forward in 8 weeks
 <b>Increased data collection and analysis</b> allowing more personalisation and different business models, but also introducing opportunities for misuse.	25% The share of Australian businesses that changed the way they delivered in the first 3 weeks of the pandemic
 <b>Changing business models</b> including the ability to make money from underused assets (like ride-sharing services) and digital platforms that organise a market rather than just participate.	23% The share of Australian businesses that changed what they delivered in the first 3 weeks of the pandemic
 More <b>flexible supply chains</b> that can change how businesses participate and compete in the global marketplace.	1/3 The share of Australian businesses that expanded their online presence in the first 3 weeks of the pandemic
 <b>Evolving tasks and capabilities</b> needs that are changing how we live, play and find and perform work.	90% The share of Australian businesses that adopted new technology to support business continuity
 Country <b>borders becoming less binding for trade</b> increasing the importance of standards and interoperability of systems.	3.2m The number of Australians who could continue working because of remote working technologies
 <b>Increasing frequency, scale, sophistication and impact of cybercrime</b> ranging from online scams through to large-scale hacking of systems.	54m The number of telehealth services delivered between 13 March 2020 to 31 March 2021

Sources: McKinsey (2020) *The COVID-19 recovery will be digital: A Plan for the first 90 days*; Australian Chamber of Commerce and Industry (2020) *Covid-19 Business Conditions Survey Report*; Microsoft and Alphabet (2020) *How technology strengthened Australian business during COVID and beyond*.

Figure 4

## Digital technology in Australia

Early 2000s	Current
<b>Infrastructure</b>	
Household internet usage moved from 79% to 86% <sup>16</sup> 9.6 million active internet subscribers <sup>16</sup> 71% of connections support >1.5Mbps download speeds <sup>17</sup> 95% of households had bandwidth demand of 24Mbps or less and monthly data downloads of 199 GB. <sup>18</sup>	Estimated that 99% of Australians with access use the internet 11.9 million premises able to connect to the NBN More than 8 million premises connected to the NBN 5G coverage for more than 50% of the population <sup>19</sup> 90% of businesses able to order ultrafast broadband with speeds of up to 1Gbps at no upfront costs
<b>Digital business and skills</b>	
5100+ average number of IT higher education course completions per year <sup>20</sup> 4% of patents are ICT related <sup>21</sup> 39% of SMEs have a web presence <sup>21</sup> 2 million .au domains registered <sup>22</sup> 5 Australian companies in top 20 ASX All Technology Index (XTX) <sup>23</sup>	Almost 7,000 higher education IT course completions <sup>20</sup> 4% of patents are ICT related Estimated 60% of SMEs have a digital presence 3.2 million .au domains registered <sup>22</sup> 54 of the 69 companies listed on the XTX originated in Australia <sup>23</sup> Digital activity contributes 5.5% (\$139 billion) to the Australian economy
<b>Government services</b>	
My Health Record launched (2012) myGov launched (2013)	22.9 million My Health Records myGov: 19.8 million registered accounts accessing 13 services 2.3 million Australians using myGovID Digital Identity 11 million individuals have linked to the ATO through myGov

# Digital trends are reshaping jobs

Australia's jobs are also becoming increasingly digital, both through growing use of digital tools in all jobs and new jobs in technology and data. Technology and digital platforms are also changing how business and workers connect to perform jobs.

Jobs that are more routine in nature like data collection and administration are increasingly being more streamlined or augmented using digital tools. Jobs that require more critical thinking or greater connections, such as accounting and teaching are being enhanced by digital technology, supporting people with these capabilities. Entirely new jobs and businesses have emerged in areas like cyber security and data analytics. The Digital Transformation Expert Panel noted estimates that by 2034, technology will augment 4.5 million Australian workers.<sup>24</sup>

This is not unusual. There has always been evolution in activity and jobs in the Australian economy, and a need to upskill to keep pace with technological change. History has shown this has led to increased overall employment and access to better jobs with higher wages.

It is important to understand how the nature of work is changing, including the role of the 'gig-based' economy, so that we can better support Australians with the skills and training to take advantage of these new opportunities.

## The changing nature of jobs in Australia

- Almost every job has changes in the tasks it involves. These shifts have been from routine towards more non-routine tasks, which are associated with higher wages and greater job satisfaction. Recent estimates are that 87 per cent of jobs now require digital skills – across every sector and industry.
- Employment for occupations requiring the highest level of skills has increased notably as a share of total employment from 15 per cent in the mid-1960s to above 30 per cent today. Analytical, cognitive, social, management and maths skills are most utilised in these roles. Of the new jobs created, most are in high-skilled occupations.
- The employment share of lower-skill occupations has fallen gradually since the 1960s but stabilised over the past decade reflecting strong demand for carers and labourers, but digital technologies are also changing these roles.
- Job categories with a relatively high share of new job titles and relatively strong growth in Australia include computer software programmers, ICT security specialists, computer network professionals, and education advisers and reviewers. Employment growth in occupations with a high share of new job titles accounted for over 10 per cent of the 4 million or so jobs created over the past 20 years in Australia.
- It is estimated that 250,000 new jobs will be created by digitalisation by 2025. Australia had more than 770,000 technology workers in 2019, 6.8 per cent higher than 2018. This was 1.5 times the growth in the number of professional occupations over the same period.

Sources: Heath, A (2020) *Skills, Technology and the Future of Work*; RMIT Online and Deloitte Access Economics (2021) *Ready, Set, Upskill - Effective training for the jobs of tomorrow*; Deloitte (2020) *Australia's Digital Pulse 2020*.

## Case study

### DIGITAL UPSKILLING FOR CONSTRUCTION

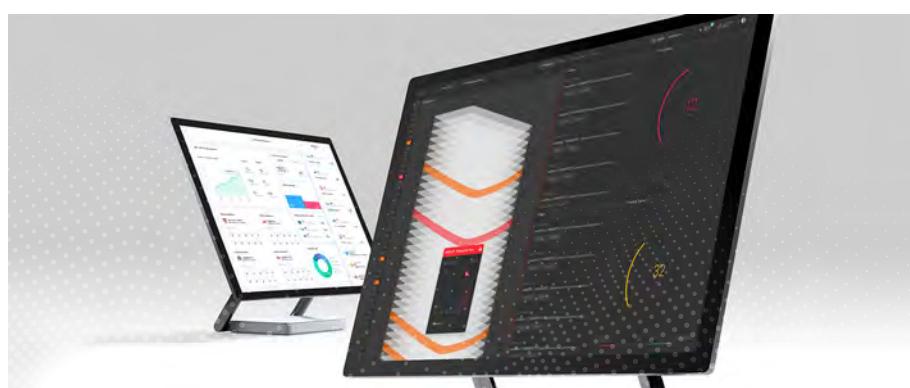
Working on large construction projects requires a much higher level of digital skills than ever before. From project management digital tools and apps to augmented reality software to walk through building sites, there's a digital future quickly moving away from pencil and paper. Large Australian world leading companies such as Lendlease and tech SMEs such as Willow are seeing the growing demand for all contractors and employees to be using digital skills.

Willow provides a software platform that creates "digital twins" of built assets. The twin is a virtual replica of any built asset and funnels data from across design, equipment, and live information into an easy-to-use interface.

Willow is also working with education providers to ensure that there is industry relevant experience of what will be needed in a world of 'digital twins' for building. During the construction of 60 Martin Place Sydney, Willow's Twin Creator platform tracked and validated all 71,848 digital assets within the building, resulting in 100 per cent completion and compliance a week prior to practical completion. Willow's team worked directly with Lendlease to ensure all stakeholders understood the digital handover process and were able to simply and efficiently deliver spatial, static and live asset data. The live data is being shared with engineering students to explore trends from across a number of systems including ventilation, lift and access control to identify sustainability initiatives and smarter maintenance practices.

This digital twin enables firms like Investa to manage the build with greater efficiency, fix problems before they occur, better manage sustainability and improve the occupant experience.

Founded in 2017, Willow has grown to more than 180 staff in Sydney, Melbourne and around the world from New York to Tel Aviv.



# AUSTRALIA'S VISION TO BE A LEADING DIGITAL ECONOMY AND SOCIETY BY 2030

The Government is committed to securing Australia's future prosperity and the digital economy plays a vital role. Over the next decade, investment in secure digital technology will underpin improvements in jobs, productivity and make Australia's economy more dynamic and resilient.

Success will be measured through delivering positive outcomes to the Australian people and businesses and by providing better government services.

## Australians

By 2030, all Australians will have access to digital skills and technology to ensure inclusivity. The digital capabilities of Australians will keep pace with new and emerging technologies so that we have a workforce that meets the needs of a modern economy. Australians will be able to maintain and build their skills through access to a range of flexible education and training offerings that are industry-relevant and informed.

Through more secure cyber practices, Australians will trust and embrace technologies to enrich their lives. People will access and confidently use digital technologies to learn, work and connect, making everyday life and jobs easier and more convenient.

Better use of data will allow for more tailored experiences, greater flexibility around how and where people work, greater consumer choice, direct benefit and control over their own data and provide more ways to connect to family and communities.

This means Australians will:

- increase their digital capabilities, at any age, through access to flexible training and education
- be able to access education, health and other essential services seamlessly online from any location over a range of mediums
- work confidently in jobs with a range of digital technologies, services and infrastructure
- use trusted digital identity to prove their identity - easily and once only - for a range of government and non-government services such as medicare, tax and banking

- enjoy simple, smart and personalised interactions with government, with proactive identification of services based on life events
- connect to digital platforms and services safely and securely for work and daily life.

## We'll be succeeding when:

- all Australians have access to high-speed internet services and the ability to use it effectively
- 90 per cent of Australians are confident using technology, protecting their privacy and assessing whether information is credible
- there is a strong pipeline of graduates with advanced digital skills coming through the education and training ecosystem, meeting demand from businesses
- the significant majority of Australians over 18 are registered for myGovID or another trusted digital identity
- there are more higher paying digitally skilled jobs in Australia and digitally intensive industries are employing more than 10 per cent of the Australian workforce.

## Business

By 2030, all businesses will be digital businesses. Business, including SMEs and the not-for-profit sector, have the confidence and capacity to invest and participate in the digital economy. A broad uplift in the digital skills of Australians allows more businesses to innovate and improve productivity using the best available technologies. They are generating rewarding and high-paying jobs, improving productivity, and are globally competitive in new markets.

Businesses and a vibrant technology sector drive future innovation, value for consumers and underpin growth across critical Australian sectors.

### A vision for digital business

Digital technologies are transforming how we do business across the economy – from small tourism operators, to those delivering in-person services, to large manufacturing firms.

**To be a leading digital economy and society in 2030, every business needs to become a digital business.**

### We need more:

- businesses understanding the value of using digital tools and services such as payroll, payments and inventory management systems, online sales platforms and social media
- businesses adopting and adapting digital technology to add flexibility, mobility and resilience to their businesses, and save themselves time and money
- digitally capable people for the modern workplace, and businesses employing workers with digitally advanced and data skills
- workers with mindsets and capabilities to transform businesses and innovate using digital technologies
- large businesses supporting the digitalisation of SMEs in their supply chains.
- trusted advisors and touchpoints providing high quality advice to support digital adoption, particularly for small and medium businesses
- granular data showing the status of digitalisation across businesses, to inform future policies and programs
- public awareness and transparency of digital support programs provided by both the private and public sector.

### We'll be succeeding when:

- all new Australian businesses are “born digital” – new businesses put digital tools, processes and mindset front-and-centre in running their business
- 95 per cent of SMEs use e-Commerce and cyber security tools, opening them up to new markets and improved productivity and resilience
- businesses can verify the digital identity of customers and suppliers with absolute confidence
- highly skilled jobs increase as a proportion of total employment and there is a pipeline of skilled workers to fill these jobs
- more Australian sectors are operating at the digital frontier
- digital production activities are increasing in value for economic activity (gross value added (GVA))
- the security of critical infrastructure and essential services like water, telecommunications and energy is enhanced
- Australian industries adopt, adapt, develop and export safe and secure AI technologies, lifting productivity, boosting competitiveness and creating jobs.

# Government

By 2030, Government service delivery will be frictionless and integrated with technology making life easier. The Australian Government will lead in the efficient, trusted and secure delivery of services to Australians online. Data will be used in the design of policies and services to better target them to the needs of Australians. Business and citizen interaction with government services will be seamless and driven by customer experience.

Service delivery will be supported by protections of public data and smart, adaptive and digitally-enabled regulation. Improved ability to use data to understand complex issues allows for better decisions and more targeted programs for all Australians.

This will mean:

- Government will deliver tailored, personalised and integrated services, proactively identifying eligible services based on life events
- high levels of cyber security across Australian Government systems to protect national security and personal information
- businesses and individuals only need to report information to government once
- providing seamless services to Australians across all levels of government
- enhanced regulatory compliance through fit-for-purpose regulation that is administered efficiently, informed by appropriate data and digitally-enabled to minimise the impost on business.

## We'll be succeeding when:

- all Australian Government services are available securely and easily online
- the significant majority of Australians over 18 are registered for myGovID or other trusted digital identity
- 95 per cent of businesses are using e-Commerce tools including e-Invoicing and Single Touch Payroll
- all new businesses are 'born digital' through streamlined business registration
- Australia has clear arrangements and agreement in place with other jurisdictions regarding cross border data flows
- Australia has a national strategy covering the regulation of the use, movement and custodianship of public and private data.

Figure 5

## Government digital initiatives underway

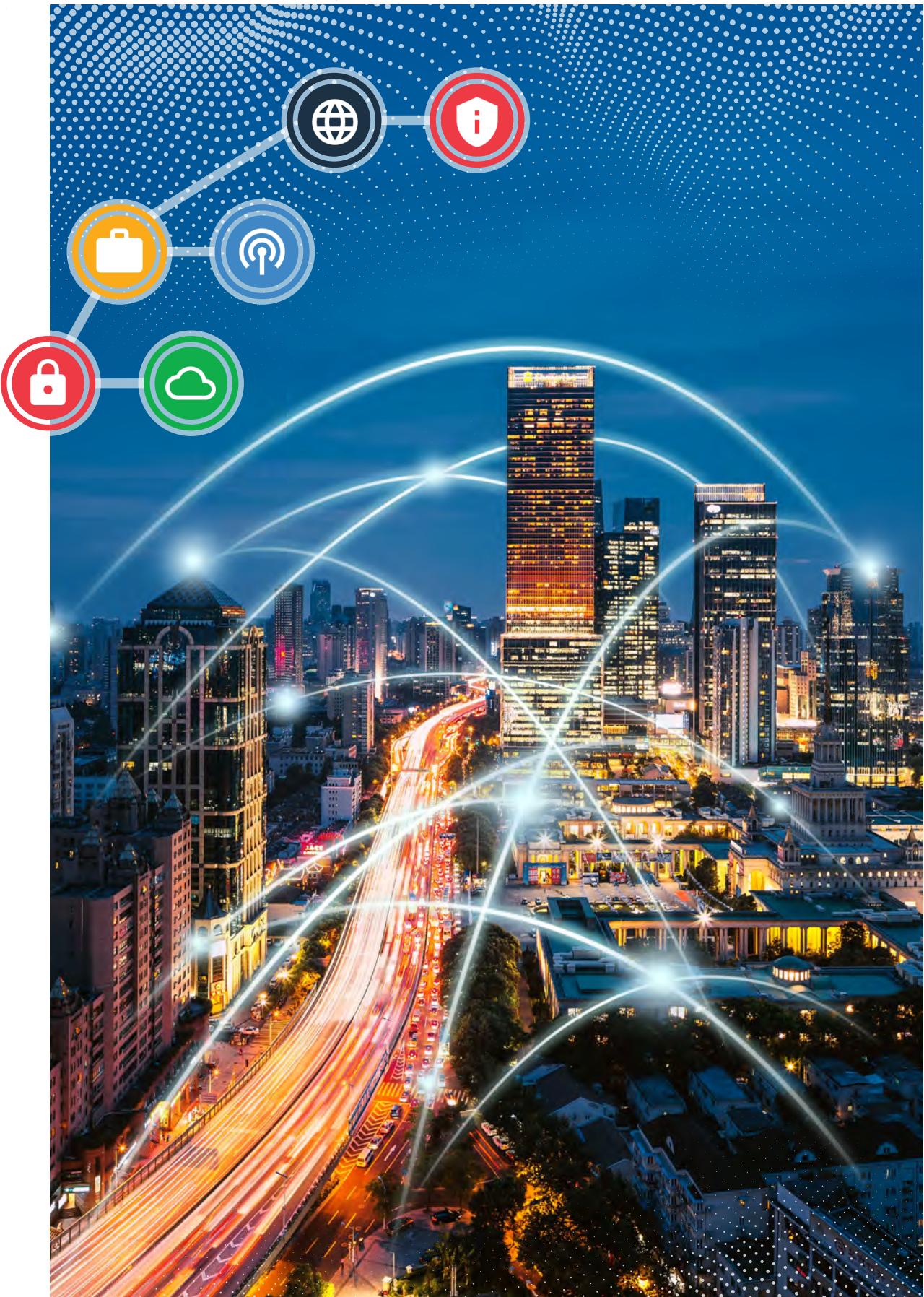
### Bringing digital policy together – a whole of government approach

There is significant work already occurring across the Australian Government in areas as diverse as privacy reform, cyber security and critical technology, the Consumer Data Right and technologies like 5G and AI. In the fast-moving digital world, much of this work needs to progress concurrently.

Digital infrastructure Connecting Australia	Cyber security, safety and trust Trusted digital interactions	Skills and inclusion Future workforce capability
<p><b>Strategies &amp; policies</b></p> <ul style="list-style-type: none"> <li>• 5G Strategy</li> <li>• Universal Service Guarantee</li> </ul> <p><b>Programs</b></p> <ul style="list-style-type: none"> <li>• NBN</li> <li>• 5G Acceleration</li> <li>• Regional Connectivity</li> <li>• Satellite Based Augmentation system</li> <li>• Microgrid Feasibility</li> <li>• Mobile Black Spot</li> </ul> <p><b>Inquiries and reviews</b></p> <ul style="list-style-type: none"> <li>• Regional Telecommunications Review</li> <li>• Telecommunications carrier powers and immunities framework</li> <li>• Telecommunications Security</li> <li>• Indigenous Digital Inclusion Plan</li> </ul> <p><b>Grants</b></p> <ul style="list-style-type: none"> <li>• 5G Innovation Initiative</li> <li>• Future Fuels Fund</li> <li>• Alternative Voice Services Trials</li> </ul>	<p><b>Strategies &amp; policies</b></p> <ul style="list-style-type: none"> <li>• Critical Infrastructure Resilience</li> <li>• Cyber Security</li> <li>• eSafety</li> </ul> <p><b>Programs</b></p> <ul style="list-style-type: none"> <li>• Cyber Security Business Connect and Protect</li> <li>• Cyber Security Assessment</li> <li>• Defence Cyber Gap</li> </ul> <p><b>Reviews</b></p> <ul style="list-style-type: none"> <li>• Consumer Safeguards</li> <li>• Privacy Act 1988</li> <li>• Social Media reforms</li> </ul> <p><b>Bills</b></p> <ul style="list-style-type: none"> <li>• Identity-Matching Services</li> <li>• Security Legislation Amendment (Critical Infrastructure)</li> <li>• Surveillance Legislation Amendment (Identify and Disrupt)</li> <li>• Data Availability and Transparency</li> </ul> <p><b>Grants</b></p> <ul style="list-style-type: none"> <li>• Australia-India Cyber and Critical Tech Partnership</li> </ul> <p><b>Frameworks</b></p> <ul style="list-style-type: none"> <li>• Artificial Intelligence Ethics</li> <li>• Protective Security Policy</li> <li>• Trusted Digital Identity</li> <li>• APEC Cross Border Privacy Rules</li> </ul>	<p><b>Strategies &amp; policies</b></p> <ul style="list-style-type: none"> <li>• Advancing Women in STEM</li> <li>• APS Digital and Data Profession</li> </ul> <p><b>Programs</b></p> <ul style="list-style-type: none"> <li>• Cooperative Research Centres</li> <li>• Digital Directors Training</li> <li>• Digital Skills Finder</li> <li>• Digital Skills Organisation</li> <li>• Industry 4.0 Apprenticeships</li> <li>• Job Ready Graduate</li> <li>• Venture Capital Partnerships</li> <li>• Employing Your First Person</li> <li>• MySkills</li> </ul> <p><b>Inquiries and reviews</b></p> <ul style="list-style-type: none"> <li>• APS Digital Capability</li> <li>• Indigenous Digital Inclusion Plan</li> </ul> <p><b>Funds / Grants</b></p> <ul style="list-style-type: none"> <li>• JobTrainer</li> <li>• Regional Collaborations (COVID-19 Digital)</li> <li>• Cyber Skills Innovation Fund</li> <li>• National Priorities and Industry Linkage</li> </ul>

**The Digital Economy Strategy brings together policies and programs across government to ensure a clear path to 2030.**

Systems and regulation Driving digitalisation		Trade and international engagement Future workforce capability
<p><b>Strategies &amp; policies</b></p> <ul style="list-style-type: none"> <li>• Australia's Critical Minerals</li> <li>• Defence Transformation</li> <li>• Digital Transformation</li> <li>• Modern Manufacturing</li> <li>• National Digital Health</li> <li>• National Disability</li> <li>• National Freight and Supply Chain</li> <li>• National Hydrogen</li> <li>• National Policy Framework for Land Transport Technologies</li> <li>• Secure Cloud</li> <li>• Whole of Government Hosting</li> </ul> <p><b>Inquiries and reviews</b></p> <ul style="list-style-type: none"> <li>• Australian Payments System</li> <li>• Digital Advertising Services</li> <li>• Digital Platforms Services</li> <li>• Australia as a Technology and Financial Centre</li> </ul> <p><b>Grants</b></p> <ul style="list-style-type: none"> <li>• Advanced Manufacturing</li> <li>• Defence Next Generation Technologies</li> <li>• Technology Co-Investment</li> </ul>	<p><b>Programs</b></p> <ul style="list-style-type: none"> <li>• Adoption and Innovation Hubs</li> <li>• Consumer Data Right</li> <li>• Defence Industry Capability</li> <li>• Digital Identity</li> <li>• e-invoicing, e-signatures and electronic AGMs</li> <li>• Advisory support for small and family businesses</li> <li>• Health Delivery Modernisation</li> <li>• Modernising Business Registers</li> <li>• MyGov, My Health Record, My Aged Care</li> <li>• Online Employment Services Gateway</li> <li>• Regional Data Hub</li> <li>• National Freight Data Hub</li> <li>• RegTech Commercialisation</li> <li>• SME Digital Readiness Assessment tool</li> <li>• Single Touch Payroll</li> <li>• Small business digital champions</li> <li>• Technology Investment Roadmap</li> <li>• Empowering Business to Go Digital</li> <li>• Research and Development Tax Incentive</li> <li>• Electronic pharmaceutical prescribing</li> </ul>	<p><b>Strategies &amp; policies</b></p> <ul style="list-style-type: none"> <li>• Defence Export</li> <li>• International Cyber and Critical Tech Engagement</li> <li>• Simplified Trade System Agenda</li> </ul> <p><b>Programs</b></p> <ul style="list-style-type: none"> <li>• Asialink Business</li> <li>• Australian Services Exports Action Plan</li> <li>• Busting Congestion for Agricultural Exporters</li> <li>• Third Open Govt National Action Plan</li> <li>• WTO Joint Statement Initiative on E-commerce</li> </ul> <p><b>Agreements</b></p> <ul style="list-style-type: none"> <li>• Australia-Singapore Digital Economy</li> </ul> <p><b>Acts/Bills</b></p> <ul style="list-style-type: none"> <li>• CLOUD Act negotiations</li> <li>• Defence Trade Controls Act 2012 reforms</li> </ul>



# THE RIGHT FOUNDATIONS TO GROW THE DIGITAL ECONOMY

A strong and dynamic digital economy requires whole-of-economy settings that provide the basis for investment in digital tools and processes, including:

- **Digital infrastructure** – to connect business and households
- **Cyber security, safety and trust** – to protect and build confidence
- **Skills and inclusion** – to build digital capabilities for the future workforce
- **Systems and regulation** – to implement smart, modern settings to drive digitalisation
- **Trade and international engagement** – to open markets and set global standards to ensure Australian businesses, workers and consumers benefit from digital trade.

The Australian Government has been working to position Australia on the path to being a leading digital economy and society. Many of the foundations are in place – building on **Australia's Tech Future**, which set out over 150 existing programs and policies supporting opportunities for a digital future and a thriving digital economy.

The Government has been making significant investments to ensure that the right infrastructure, skills, systems and regulation are in place to enable economic growth and prosperity.

The **Digital Business Plan**, released in September 2020, is helping businesses to use digital technologies to grow and create jobs as part of the economic recovery. The Digital Business Plan invested in digital infrastructure and skills, removed out-dated regulatory barriers, boosted small business capability, and simplified doing business with government. Activity is underway to progress the Digital Business Plan across government, with major milestones including:

- Launch of the first round of the Australian 5G innovation initiative in February 2021 to fund small to large businesses to test and develop 5G uses, applications, services and products. This technology will drive productivity across key industry sectors like agriculture, mining, retail, health, construction and manufacturing.
- Amendments to the *Competition and Consumer Act 2010* in December 2020 to promote the ongoing rollout of the Consumer Data Right.
- Launch of the Regtech Commercialisation Initiative under the Business Research and Innovation Initiative to improve regulatory compliance, reduce regulatory administration, and directly support innovative firms.

# Digital infrastructure

## To connect businesses and households

A key underpinning for the digital economy is to have the infrastructure that makes it possible to access the digital world. By investing in the physical and digital infrastructure that keeps us connected and online, more Australians can participate in the digital economy. Australian Government investment in regional digital infrastructure continues to support digital inclusion by delivering fast, affordable and reliable connectivity.

This infrastructure is underpinned by a competitive market and multiple infrastructure owners for fixed wireless, fixed line and mobile infrastructure for which the Government's regulatory regime supports open competition and facilitates deploying communication facilities as well as the allocation of spectrum.

## What has already been delivered?

The rollout of the **NBN** is largely complete and has provided ubiquitous access to high speed wholesale broadband to support dozens of retail service providers to deliver the opportunities of the digital age to households and businesses the country. The Government committed in 2020 that the NBN would invest a further \$4.5 billion to provide access to higher wholesale speeds to an estimated 75 per cent of homes and businesses on the fixed-line network by 2023. This will make the highest speed tiers available to these premises should they wish even higher broadband speeds.

This commitment by NBN Co will also support business innovation, productivity and growth by making business-grade fibre services more affordable and accessible, through the creation of 240 business fibre zones and enabling 90 per cent of Australian businesses to access NBN Co's ultrafast broadband business services at no upfront cost. Regional areas will benefit including through the upgrade of fibre to the curb services and enabling 950,000 premises in fibre to the node areas to access higher wholesale speeds on demand. The \$300 million co-investment fund is aimed at converting more premises from fixed wireless and satellite to fixed-line broadband services and 85 of the business fibre zones are in regional Australia. The **Australian Broadband Advisory Council** (ABAC) has been established to provide advice on ways to maximise the benefits of high speed networks in key sectors of the economy.

The Government's **Universal Service Guarantee** provides for all premises in Australia to have access to baseline broadband services, as well as ongoing access to standard telephone services and payphone services.

The Government is supporting the roll out of 5G services through the timely availability of spectrum, streamlining deployment arrangements and showcasing trials of 5G use cases to promote business uptake. Spectrum is key to enabling higher capacity for more data to be transmitted for mobile digital communication for robotics and logistics for agtech and mining. The **Australian 5G Innovation Initiative** is supporting private sector investment in 5G trials to demonstrate the capabilities of 5G and productivity benefits to businesses in Australia.

The **Regional Connectivity Program** is making targeted investment in ‘place-based’ telecommunications infrastructure to deliver economic and social opportunities for regional, rural and remote Australian communities. Funded projects under Round 1 included upgrading 4G services on King Island, expanding fibre broadband to Indigenous communities in the Northern Territory and improving wireless broadband around Roma in Queensland to support agricultural producers to use new technologies to improve productivity. Through projects like these, more communities have access to telehealth, new agtech services, and online educational and business opportunities. The **Mobile Black Spot Program** is funding new mobile base stations to address mobile coverage issues across regional and remote Australia, with over 925 base stations activated.

The Government is continuing to deliver around \$4 million a year to maintain community payphones and satellite Wi-Fi telephones in small Indigenous communities which historically have limited, or in some cases no, access to mobile phone or internet services.

## New investments for the next step change

The Government is investing a further \$84.8 million to expand the **Regional Connectivity Program** to continue to improve internet and mobile services in regional and remote Australia that are outside the NBN fixed line footprint. A further \$68.5 million has been allocated towards supplementary rounds of the Regional Connectivity Program and the **Mobile Black Spot Program** to address connectivity issues across Northern Australia.

The **Peri-Urban Mobile Program** will provide \$16.4 million to improve network infrastructure in the urban fringe of Australia’s major cities (the peri-urban fringe) that are prone to bushfires. These areas include the Blue Mountains, northern parts of Sydney, the Perth and Adelaide hills districts and the north of Melbourne.

Funding will be provided to continue and extend the **Measuring Broadband Australia** program to assist consumers to select reliable, high-speed fixed-line broadband services. Fixed wireless broadband services will now be included in the program to ensure additional regional and emerging market segments can benefit from this information.

## Next steps to 2030

Timeframe	Infrastructure
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>• Ensure 75% of homes that get a fixed line NBN can order gigabit NBN</li><li>• Support rollout of 5G through the allocation of spectrum in the 26 GHz and 850/900 MHz bands via competitive auction</li><li>• Complete and assess the Alternative Voice Services Trial to inform future approaches to the Universal Services Guarantee</li><li>• Showcase successful trials of 5G use cases to promote business uptake and promote business use cases for NBN in key sectors</li><li>• Address regional Australia's current and future infrastructure and affordability needs with State and Territory governments</li><li>• Deliver next Regional Telecommunications Review</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>• Expand high-speed internet and mobile coverage in regional Australia, supported by future government investments, new technologies (such as satellite) and Regional Telecommunications Reviews</li><li>• Invest in the underlying infrastructure to support next generation telecommunications technologies, such future G technologies</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>• All Australians have access to high speed internet services and the ability to use it effectively</li><li>• Integrated data and technologies are making life easier</li></ul>

# Cyber security, safety and trust

To protect and build confidence

Security, safety and trust are essential to the digital economy. Businesses and consumers will only actively engage in the digital economy where they are confident they can trust the technologies, services and platforms, and they know who they are dealing with.

## What has already been delivered?

The Australian Government's **Cyber Security Strategy 2020** lays a strong foundation for Australia's digital future with a \$1.67 billion investment. The Security Legislation Amendment (Critical Infrastructure) Bill will uplift the security and resilience of Australia's critical infrastructure. Elements of digital trust – such as cyber security, data security and identity assurance – are emerging as valued commodities that can create marketable business opportunities. Through the **Cyber Security Best Practice Regulation Task Force** the Government is now considering voluntary initiatives and further legislative changes to help Australian businesses across the economy become more resilient to cyber security threats.

The Government is also ensuring law enforcement has the powers and capabilities to investigate and disrupt cybercrime, including on the **dark web**. The Surveillance Legislation Amendment (Identify and Disrupt) Bill introduces new law enforcement powers to combat cyber-enabled crime, including online child exploitation. The Government has also committed \$164.9 million to strengthen Australia's counter cybercrime capability.

Increased numbers of outreach officers in the **Joint Cyber Security Centres** play a key role in strengthening industry partnerships. The **Australian Cyber Security Centre** (ACSC) is Australia's lead operational cyber security agency that identifies cyber threats, provides technical cyber security advice and guidance, and builds partnerships with critical infrastructure, industry and government to protect Australians. The ACSC will continue to provide Australians and businesses with advice through the one-stop-shop **cyber.gov.au**.

**AustCyber**, Australia's Cyber Security Growth Network, and the **Cyber Security Skills Partnership Innovation Fund** are supporting the pipeline of skilled cyber security professionals and supporting cyber security solutions from business set-up to export. The **Cyber Security Cooperative Research Centre** is helping governments and key stakeholders drive innovative research to build Australia's cyber security capacity and capability.

To support SME use of digital technologies, the **Cyber Security Business Connect and Protect program** provided funding to trusted business advisers to work with SMEs and lift their cyber security capability for the benefit of themselves and their customers. Further, the **Cyber Security Assessment Tool** delivered by the Government in March 2021 provides businesses with an online tool to regularly self-assess their cyber security maturity and receive practical actionable advice from the ACSC to improve their cyber security.

Australia has led the world by being first to establish a government agency committed to keeping its citizens safer online. Australia's **eSafety Commissioner** has powers relating to cyberbullying, image-based abuse, and illegal and harmful online content. The significant increase in internet use as a result of COVID-19 also led to an increased demand for support to respond to negative online experiences – and additional funding was provided to eSafety to deliver on this.

The new **Online Safety Act** will ensure better protections for all Australians through enhanced complaints and removal schemes for child cyberbullying, image-based abuse and harmful online content. It will also include a new adult cyber-abuse scheme and a new power to block access to sites containing abhorrent violent material and stronger expectations and mandatory transparency reporting for industry.

As Australians spend more of their time online, and new technologies emerge, more personal information about individuals is being captured and processed. The **review of the Privacy Act 1988** is considering whether the Act remains fit-for-purpose. Outcomes of this review will also build on **Social Media reforms** that increase the maximum civil penalties under the *Privacy Act 1988* and develop a binding privacy code to apply to social media and other online platforms that trade in personal information.

## New investments for the next step change

The Australian Government is investing \$31.7 million to pre-emptively identify and address the range of security risks presented by the 5G and 6G technology that will underpin Australia's digital future. The Government will establish '**Secure G' Connectivity Test Lab**' in partnership with the private sector to trial innovative approaches to network security and data protections. Looking ahead to the next generation of communications technology, 6G security research and development will assist in identifying potential security risks and enable the Government to take proactive measures to secure it.

A **National Data Security Action Plan** will provide Government with a whole-of-economy approach to data security uplift, and set the roadmap for the development of clear data security standards for the entire digital economy. Consistent data security standards and controls will ensure that the Government is able to deliver digital services underpinned by security and backed by public trust.

Additional funding of \$43.8 million will be provided to expand the **Cyber Security Skills Partnership Innovation Fund** for industry and education providers to deliver more projects that meet local requirements to quickly improve the quality and quantity of cyber security professionals in Australia.

The Australian Government will pilot three **Cyber Hubs** to enable leading agencies such as Defence, Home Affairs and Services Australia to provide cyber services for those agencies that cannot match their breadth and depth of skills. This will uplift the protection of the government services and data that Australians and businesses rely on, and make it harder for malicious actors and cyber criminals.

## Next steps to 2030

Timeframe	Cyber security, safety and trust
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>• Strengthening Australia's cyber security incentives and regulations through the Cyber Security Best Practice Regulation Task Force and feedback from industry</li><li>• Improve protections for Australian's privacy online and transparency of data handling practices through the review of the <i>Privacy Act 1988</i></li><li>• Deliver a review and updates to the cyber security related occupations as coded in the Australian and New Zealand Standard Classification of Occupations</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>• Develop a cyber security skills shortage forecasting methodology and model with reporting and ongoing data collection by 2024 to more effectively target initiatives that address cyber security skills demand</li><li>• Privacy settings in place that empower consumers, protect their data and serve the Australian economy</li><li>• A National Data Security Action Plan makes public and private data more secure through the introduction of standards and policies as part of a National Data Security Action Plan</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>• Strengthened cyber security and data settings supports Australian businesses and Australians to improve cyber security practices</li></ul>

# Skills and inclusion

## To build digital capabilities for the future workforce

Increasing the digital capabilities of all Australians will be key to ensure we can all actively participate in the digital economy. All jobs are increasingly requiring some level of digital skills. New and emerging technologies are also driving a need for more advanced digital capabilities across industries.

The Digital Transformation Expert Panel emphasised the value of lifelong learning for skills and workforce development, business operations and for individuals. This requires high quality relevant education and training, and strong partnerships between governments, employers and education and training providers.

Australia's prosperity relies on inclusion. This means all Australians being able to afford, access and benefit from digital technology, tailored to their needs. Australians should feel well-equipped to use digital technology confidently, safely and securely. A digitally inclusive and capable Australia will enhance workforce participation, community engagement and access to social assistance.

## What has already been delivered?

The Government's significant investments in education, skills and training, especially during the height of the COVID-19 pandemic, prioritised the areas most in demand for employers.

In the school system, young people are learning to use design thinking and be innovative developers of digital solutions with the **Australian Curriculum**. Foundation to Year 10 *Digital Technologies Curriculum* alongside the *ICT General Capability* involves students learning to make the most of the digital technologies available to them, adapting to new ways of doing tasks in a digital environment. The Australian Curriculum is being reviewed in 2021 to ensure a focus on essential content or core concepts, that the curriculum is fit-for-purpose and is preparing Australian students for the workplaces of the 21<sup>st</sup> century.

There have also been some extraordinary partnerships between business and education and training institutions, with the Government's support, to ensure that all Australians, have access to opportunities to upskill their digital capabilities in areas that align with job opportunities and business needs.

Eligible Australians are supported to develop their foundational digital literacy through the **Foundation Skills For Your Future** program, building their capacity for workforce participation and further education and training.

Digital literacy and ability are being considered as part of an **Indigenous Digital Inclusion Plan** currently being developed. The Plan will consider Government investments to date to improve Indigenous digital inclusion and identify priorities for further work. It will also have a focus on access and affordability.

**JobTrainer** created a \$1 billion fund shared with the states and territories to create 300,000 new training places. Combined with the 30,000 extra university places in 2021 and funding for higher education short courses, on top of the considerable existing investment in skills and higher education, Australians have access to learning options to suit their circumstances and future job opportunities.

Recognising the ever increasing importance of digital capabilities for every job into the future, many of the Government's recent education and training measures have a focus on growing digital skills including:

- The **Job Ready Graduates Package**, designed to encourage students to enrol in areas of national priority, such as IT, is reducing the maximum student contributions from \$9,698 to \$7,950. In addition, higher education providers will receive an increase in funding per student from \$11,015 to \$13,250 to further encourage providers to offer courses in IT.
- The **Digital Skills Organisation** is working closely with digital employers to strengthen training to meet emerging digital skills needs. Its initial focus is testing approaches to bring together employers and training providers to rapidly train individuals for digital roles, with the first project focusing on training 100 data analysts.
- The **Australian Industry and Skills Committee** has developed new training products in response to emerging skills needs across industry sectors, including developing **cross-sector units and skills sets** to address common skills needs including in the areas of **big data and cyber security**.
- Funding for several programs testing advanced apprenticeship-style courses, including in IT, which feature a new model of collaboration in higher education delivery between universities, industry and government. The **Industry 4.0 Advanced Apprenticeship Pilot** targets SMEs in key manufacturing 'pipeline' industries, delivering training to employees in advanced manufacturing technologies. The **Women in STEM Cadetships and Advanced Apprenticeships Program** supports part time study for female employees looking to upskill in science, technology, engineering and mathematics (STEM) fields or move into a STEM career.

Australia has an exceptionally capable and responsive **higher education sector** which responded to COVID-19 by developing over **four hundred subsidised six-month higher education short courses**, which were required to be delivered online. In the additional short courses being funded in 2021, 152 Information Technology short courses will be offered, making up around 18 per cent of approved courses.

Under the Australian Government's Job-ready Graduates reforms, \$900 million has been committed over 4 years to the **National Priorities and Industry Linkage Fund** (NPILF) which has been established to support universities engage with industry and create job-ready graduates. A key priority for the NPILF is to increase the number of STEM-skilled graduates and improve their employment outcomes. This will help build the STEM skills necessary for Australia's future workforce, including in digital technologies, alongside the **Advancing Women in Stem** Strategy and Action Plan 2020.

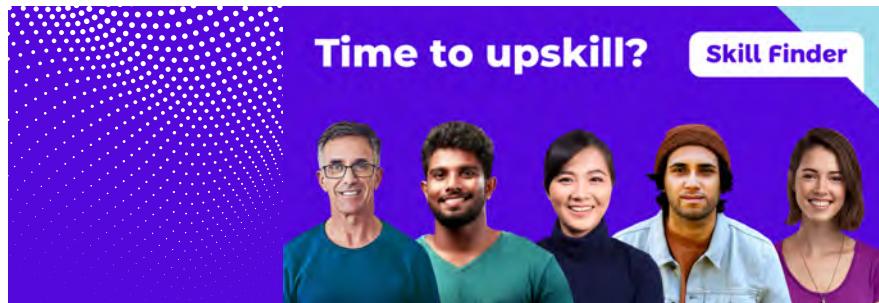
As part of the Government's JobMaker Plan, the **Global Business and Talent Attraction Taskforce** was established to help generate quality jobs for Australians. Bringing businesses and exceptional individuals to Australia helps local industry and partners reap the benefits of their ideas, capital, talent and networks to build clusters of excellence in priority sectors, conduct cutting-edge research and development, and fill gaps in supply chains. This work complements the **Global Talent Visa Program**, that supports highly skilled professionals to work and live permanently in Australia.

Australia is after the brightest and best global talent to work in identified future-focused sectors including agtech, fintech, health and defence. The visa program is designed to help grow our digital economy and create opportunities for Australians by transferring skills, promoting innovation, and creating jobs.

Case study

## FROM LITTLE SKILLS COMES BIG THINGS

Funded under the Digital Business Plan, Skill Finder launched in October 2020 as a world-first - and free - micro skill marketplace available to all Australians. The platform provides an opportunity for “every Australian to up-level their knowledge with transferable and useful micro-skills, so they are prepared for the digital world and workforce.



Adobe and Amazon Web Services (AWS) provide cloud services to support the website whilst many global tech leaders including Atlassian, Canva, MYOB, Xero, Adobe, AWS, Google, IBM, LinkedIn, Microsoft, Salesforce and Twitter have indexed courses on the site. Skill Finder now indexes 15 Be Connected courses, with a view to working together to further promote the Be Connected program amongst their users.

To add to its reach, the Office of the eSafety Commissioner has worked with Skill Finder to ensure that Be Connected is included in these training resources. Be Connected was designed for older Australians to build their digital skills, but can be used more widely help build the digital literacy baseline for all Australians, giving them the confidence to undertake more complex digital courses or use these new skills to enter the workforce.

## New investments for the next step change

Delivering on education and training requires strong partnerships and this is a key focus of the next phase of investment in digital skills.

The **Digital Skills Cadetship Trial** will be designed and delivered with industry partners to provide innovative trials of skilling people to fill in-demand digital jobs. The Government is investing \$10.7 million over three years to increase the number of Australians with digital skills through a four-to-six month cadetship comprising formal training with on-the-job experience provided by host employers.

The next **National Skills Agreement** being developed with the States and Territories will ensure we continue to deliver the skills for the future workforce, together helping businesses develop the skills they need to engage in the digital economy. Priority reforms under the Heads of Agreement for Skills Reform include all government working together to strengthen industry engagement in training, VET qualifications and the quality of training.

As part of the Commonwealth's commitment to providing stronger support for foundation skills under the Heads of Agreement for Skills Reform, the Government is expanding and uncapping the **Skills for Education and Employment program**, and providing an additional \$4 million over two years to support projects that better incorporate digital skills training for job seekers.

Under the extension and expansion of the **JobTrainer Fund**, 10,000 places will be allocated to digital skills courses.

To ensure that Australia will also meet its more advanced technology needs, the Government is investing a further \$22.6 million to establish the **Next Generation Emerging Technology Graduates Program** and \$24.7 million for the **Next Generation AI Graduates** over the next six years. These will provide more than 400 competitive national scholarships in emerging technologies such as artificial intelligence, robotics, automation, cyber security, quantum computing, blockchain and data in priority areas identified through the National Manufacturing Priority Roadmaps.

## Next steps to 2030

Timeframe	Skills and inclusion
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>Delivering the National Skills Agreement with State and Territory Governments</li><li>Deliver Indigenous Digital Inclusion Plan</li><li>Implementing the Advancing Women in STEM Action Plan 2020</li><li>Work with stakeholders including State and Territory governments to:<ul style="list-style-type: none"><li>ensure the Australian Curriculum embeds digital literacy as an essential capability demonstrated through the learning areas; and</li><li>implement targeted training courses/microcredentials to build digital skills, and encourage workers to reskill</li></ul></li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>Increase the number of people undertaking digital skill training (higher education/VET/microcredentials)</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>All Australians have access to digital skills</li><li>Tertiary advanced digital skills graduates will increase to more than 15,000 per year</li><li>90% of Australians are confident using digital technology, protecting their privacy and assessing whether information is credible</li></ul>

# Systems and regulation

To implement smart and modern settings to drive digitalisation

Modern regulatory settings and systems are the building blocks that will maximise productivity and enable people, businesses and government to realise the full benefits of the digital economy. Rules and laws should provide security and certainty while remaining fit-for-purpose and agile as technology develops. By investing in enabling systems and digital service delivery, the Government can deliver better outcomes for all and drive broader digital transformation.

## What has already been delivered?

### Enabling systems

The Australian Government has taken a world-leading position on the regulation and settings needed for an accelerating digital economy. This is exemplified by the **News Media and Digital Platforms Mandatory Bargaining Code**, which was a recommendation from the Australian Competition and Consumer Commission's (ACCC) **Digital Platforms Inquiry** (DPI). The DPI also resulted in new six-monthly reporting by the ACCC on emerging competition issues in the markets for the supply of digital platform services, and the commencement of a review of the *Privacy Act 1988*. The Government is acting to ensure that competition settings and regulation is fit-for-purpose in the digital age. Over the next decade, the Government will also consider issues relating to emerging digital industries, like the gig economy, as these industries grow in relevance and play a significant role in Australia's digital economy. We need to ensure that the regulatory framework for these industries remain fit-for-purpose and allow digital industries to maximise their productivity and utility to Australians.

Australia's **Consumer Data Right** (CDR) will be a game changer. The CDR is designed to give consumers greater access to and control over their data that is held by private companies. It improves consumers' ability to compare and switch between products and services, and encourages competition between service providers, leading not only to better prices and service quality for customers but also more innovative products and services. The banking sector is the first to be transformed by CDR, and the energy sector is next. In 2021 telecommunications will be assessed, with a rolling program to assess and designate a new sector each year.

The **Digital Business Plan** and **Deregulation Agenda** continue to remove outdated and burdensome regulation, and support the greater uptake of digital technology while retaining essential safe-guards. This has enabled companies to hold virtual meetings and execute documents electronically, and reforming the regulation of stored-value facilities to drive competition and innovation. The Government's renewed Deregulation Agenda supports leadership and stewardship of fit-for-purpose regulation with a focus on lifting regulator performance across government to drive economic recovery and growth.

It is estimated that in excess of 1.2 billion invoices are exchanged annually in Australia, and around 90 per cent of business invoice processing is still labour-based. **e-Invoicing** is the digital exchange of invoices directly between the accounting systems of a buyer and a supplier that can deliver around \$20 of savings every time an e-Invoice replaces a traditional invoice. The Australian Government has committed to using e-Invoicing by its agencies by 1 July 2022. It will also pay all e-Invoices under \$1 million within 5 business days, improving business cash flow.

The **review of the Australian payments system** is also ensuring that the regulatory architecture can support, accommodate and respond to advances in payments technology. Continued innovation of this key economic infrastructure will be central to lowering transaction costs, improving safety and reducing the cost to doing business.

A further \$419.9 million investment was delivered in the Digital Business Plan to fully implement the **Modernising Business Registers** program. This will allow businesses to quickly view, update and maintain their business registry data in one location instead of the more than 30 current registries.

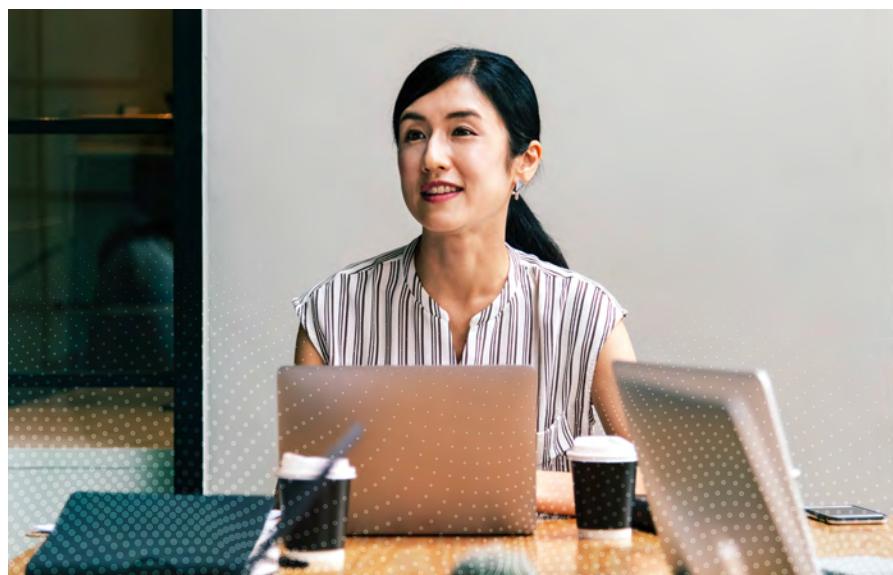
Case study

## MAKING LIFE EASIER FOR SMALL BUSINESS

**Single Touch Payroll (STP)** provides employers and tax practitioners with digital end-to-end services to report payroll and superannuation information, reducing compliance costs for business and allowing pre-filling of individuals' income tax returns and business activity statements. More than 99 per cent of large employers and 85 per cent of small employers are reporting through STP. This digitisation has also improved government service delivery, most recently enabling the rapid deployment of JobKeeper, which was life-saving support for so many businesses and workers during COVID-19.

Strategium is a small and rapidly growing management consultancy business based in Canberra. The transition to using STP was surprisingly easy and did not require their bookkeeper or accountant.

STP has delivered benefits to Strategium including easier compliance easier and a better understanding of where the money is flowing.



The Australian tax system provides a number of incentives to support businesses digitise, adopt new technologies and innovate. **Temporary full expensing** allows eligible businesses to immediately deduct the business portion of the cost of an asset in the year it is first used or installed, encouraging investment to digitise. The **Venture Capital Limited Partnerships and Early-Stage Venture Capital Limited Partnerships** incentives offer tax benefits to stimulate venture capital investment.

The **Research and Development Tax Incentive** (R&DTI) provides businesses with a tax offset for eligible R&D expenditure incurred in developing new or improved products, processes and services that will help make Australia more competitive and create more jobs in the long-term. As part of the economic recovery plan, the Government invested a further \$2 billion through the R&DTI in the 2020-21 Budget to support business R&D investment in Australia.

## Government services

The Australian Government is making investments in foundations such as digital identity and Single Touch Payroll that are transforming the services relied on by Australians and businesses to provide seamless service delivery.

The **Digital Identity system** will enable more secure and convenient engagement with government services, and in future, the private sector. The Government invested a further \$256.6 million in the Digital Identity system in the 2020-21 Budget. Digital identity is already being used by more than 2.3 million Australians and 1.2 million businesses to access over 75 government services.

Launched in July 2018, the **Online Employment Services Trial** was rapidly expanded in April 2020 to support the large cohort of jobseekers accessing Government support during the COVID-19 pandemic. In excess of 1.4 million job seekers have been initially referred through the Online Employment Services gateway, with more than 400,000 job-ready job seekers digitally self-managing their way back to employment without the assistance of employment services providers.

To support the delivery of the New Employment Services Model from July 2022, the Government has invested \$295.9 million over four years in Tranche 1 to deliver a new **Digital Employment Services Platform**. This investment will generate considerable benefits for all users, including jobseekers, employers and employment services providers. It will improve matching, pre-screening and validation processes for jobseekers, assist employers and providers in maximising employment outcomes. Future tranches will build on the foundations from the new digital platform, maturing the capabilities and further linking with other government programs.

The **Office of the National Data Commissioner** is streamlining public sector data sharing to promote greater use that drives innovation and economic, social and environmental benefits. The **Data Availability and Transparency Bill** will set standards for safe and transparent sharing of public sector data.

## New investments for the next step change

Accelerating **e-Invoicing** adoption across the economy is an ongoing priority for the Government. The Government will progress a range of measures to enhance e-Invoicing's value for businesses and increase adoption. These include working to more closely link e-Invoicing to payments to help businesses get paid faster, a series of education activities to raise business awareness, and e-Invoicing pilots across key supply chains to test and drive adoption. The Government will also progress further consultation on regulatory and non-regulatory options to accelerate e-Invoicing adoption, and continue work with states and territories to boost adoption across Australia's public sector.

The Government has committed a further \$111.3 million to strengthen and expand the world-leading **Consumer Data Right** (CDR) across the economy. It will continue to establish the foundations of the data economy, creating new opportunities for Australian consumers and data-driven businesses. This measure includes funding to accelerate the rollout of CDR, including continued implementation in the banking and energy sectors and undertaking a strategic assessment to deliver a roadmap for economy wide rollout. It will also expand Australia's international influence to establish an interoperable and rules-based approach to international consumer data portability and sharing frameworks.

Customers empowered by CDR to view their data and use it to transact easily, more securely and efficiently, will drive increased competition and data-driven innovation in Australian businesses. They will benefit from improved services and product offerings while saving time and money. The Government will promote Australia as an international leader in consumer data portability, supporting our fintech exports and improving access by our consumers and businesses to data driven services.

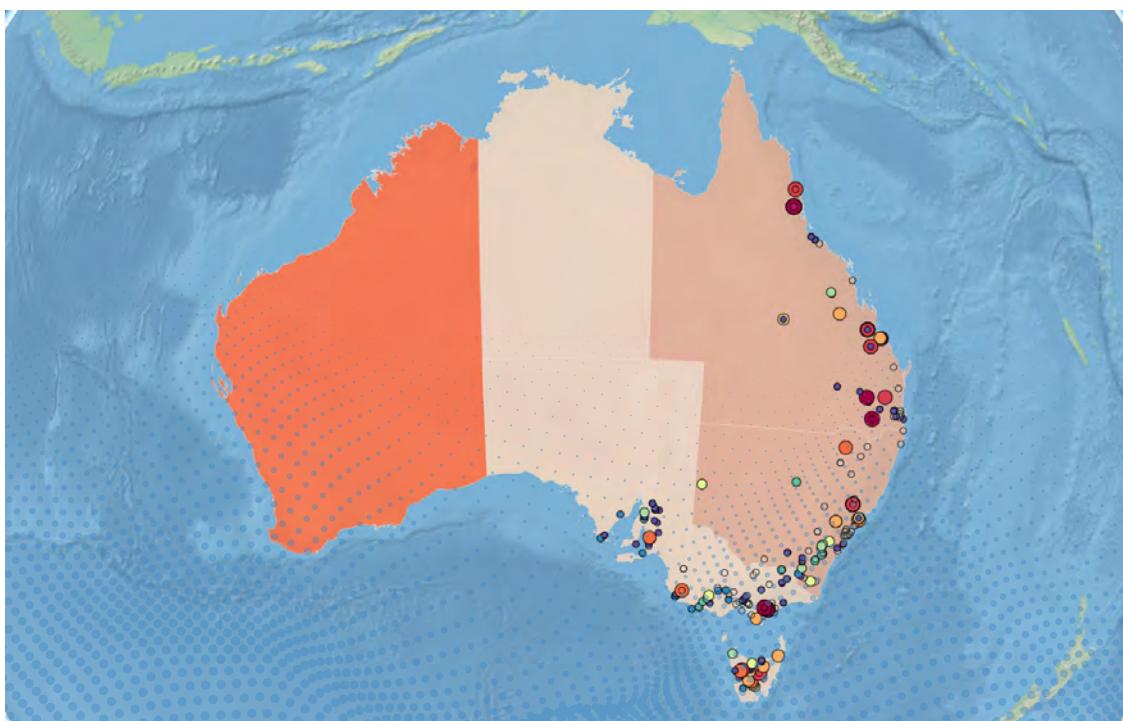
The Government is committing to deliver an **Australian Data Strategy** by late 2021 that will set out how the Government will enhance effective, safe and secure data use from 2021 to 2025. The Data Strategy will explore how to enable a data-driven economy through improved economy-wide data sharing while embedding trust and security in data use. It will also outline existing data initiatives across Government and opportunities to harmonise and streamline approaches to minimise burden on stakeholders. For example, it will look to identify how the CDR and supporting institutions could be further leveraged to build a data-driven economy.

Funding of \$16.5 million for a pilot program that will develop **data inventories** for 20 per cent of Australian Government agencies will enhance the management of government data assets.

The **Digital Atlas** will be a collaborative, dynamic and secure platform, based on a modernised and updated NationalMap, which delivers advanced location data analytics and a rich data environment compiled from accurate, authoritative and ready-to-use data sources covering people, the economy, employment, infrastructure, health, land and the environment. It will present data against Australia's geography, allowing governments and other organisations to better understand and respond to issues, including national disasters and infrastructure planning.

Figure 6

**NationalMap showing mineral exploration overlaid with power generation capacity under the National Electricity Market**



The Australian Government is also investing in modernising regulation to reduce the burden and improve regulatory outcomes for business. Through the \$120 million **Deregulation Agenda**, the Government is investing in technology to reduce regulatory impacts on business. This includes streamlining digital services in the health sector to reduce the regulatory burden on around 400 companies that currently lodge 2,000 applications annually in the pharmaceutical, medical technology services and medical software industries.

In addition, improved electronic monitoring systems will assist around 610 fishing businesses to more efficiently meet their regulatory requirements and will also help an estimated 1,220 commercial fishing businesses meet data provision requirements to enable more informed decision making.

Through the **Modernising Business Communications** work, the Government has committed to modernising laws within the Treasury portfolio so they are technology neutral. This will enable easier communication between businesses, individuals and regulators. The Deregulation Agenda will also make it easier for business to employ Australians, utilising digital solutions to assist small business to comply with modern awards.

The **Trusted Digital Identity Framework** sets out the rules for the national digital identity scheme. This Framework will make it easier and safer for people to access online services and provide additional protections against identity crime, which is estimated to cost the economy over \$3.1 billion a year. The Government will progress legislation to enable the rollout of the Framework to the private sector and other governments. The legislation will embed privacy, security and fraud prevention mechanisms to build trust and confidence by those who choose to participate.

## Next steps to 2030

Timeframe	Systems and regulation
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>The ACCC to release six monthly reports on competition and consumer issues relating to digital platforms to 2025</li><li>Review of the News Media and Digital Platforms Mandatory Bargaining Code</li><li>Progress reforms to media laws towards an end state of a platform-and-technology neutral regulatory framework</li><li>Office of the National Data Commissioner to build inventories of data assets with Australian Government agencies</li><li>Improve data servicing and sharing between Australian Government agencies and trusted partners</li><li>National Disability Data asset final report on pilot outcomes, including 5 test cases, is delivered</li><li>Modernising Business Registers: companies release (Companies Register), including linking to director ID and significant data migration</li><li>Continued deep dives on key regulatory issues as part of the Deregulation Agenda</li><li>Regulator Performance Guide is implemented and Ministers issue Statements of Expectations for regulators</li><li>Implementation of CDR in energy sector and assessment of telecommunications sector. Strategic analysis undertaken to determine whole of economy roll out of CDR</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>Consumer Data Right: Yearly assessment and designation of new sectors</li><li>Modernising Business Registers: Professional Registers implemented and decommissioning of legacy systems</li><li>Data sharing under the Data Availability and Transparency framework delivers improved government services, government policy and research outcomes</li><li>Stewards of regulations and regulatory approaches ensure regulatory frameworks and regulator practices are fit-for-purpose and light touch</li><li>Contemporary Regulator Performance Guide reflects the Government's expectations for regulators</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>Smart regulation that builds trust is embedded across government systems, processes and legislation</li><li>All government data sources are readily discoverable and reusable</li><li>New and updated legislation is technology-neutral</li><li>Integrated data and technology that makes life easier</li></ul>

# Trade and international engagement

To open markets and set global standards to ensure Australian business, workers and consumers benefit from digital trade

In an increasingly global world, engaging internationally to influence the development of international rules and standards for digital technologies will ensure Australian businesses, workers and consumers have a competitive edge. Promoting Australia as a safe and stable place to do business will encourage investment and further digital trade agreements will open opportunities for Australian businesses.

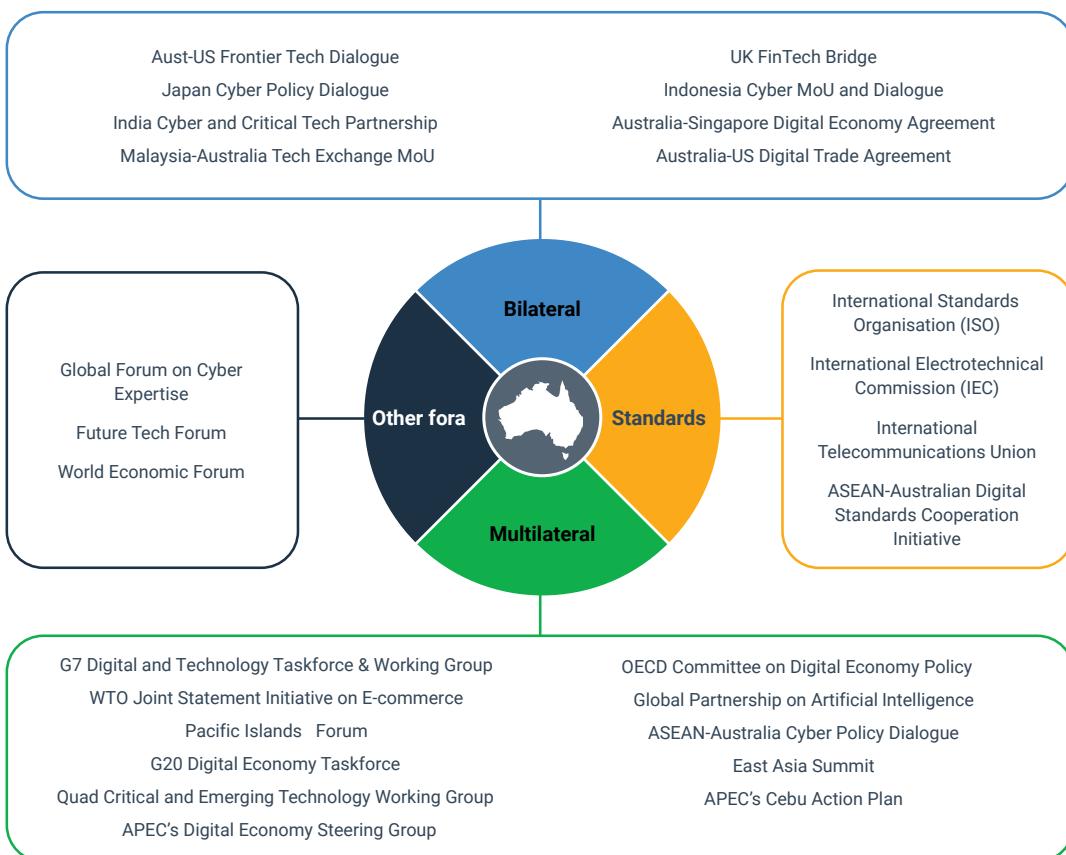
## What has already been delivered?

In our region, we have negotiated high quality rules to support digital trade through the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, Regional Comprehensive Economic Partnership and through bilateral free trade agreements. In 2020, the Australian Government signed a ground-breaking **Digital Economy Agreement with Singapore**. The agreement features modern, upgraded rules to free up data flows and increase compatibility for online trade. It sets the conditions for Australian businesses and consumers to make the most of the digital economy.

Australia is **engaging bilaterally and multilaterally** to lead and influence the setting of norms, standards and regulations for digital technologies (Figure 7). International technology standards support Australian and global business productivity by facilitating innovation and establishing a common language for new digital concepts and technologies. Without harmonised international standards Australian businesses may face higher costs of doing business if they need to comply with different standards for different markets.

Figure 7

## Australia's international engagement on digital technology



In 2020 the Australian Government allocated \$5.9 million over three years to **step up our leadership, influence and uptake of international standards**. Funding will include support to Australian peak standards and conformance bodies and a dedicated boost to digital, critical technology and critical minerals standards work. Having more Australian experts participate in more international standards committees will build our capability to apply international standards and help businesses to use them. It will also help Australian businesses capture new markets opportunities and maintain their global competitiveness.

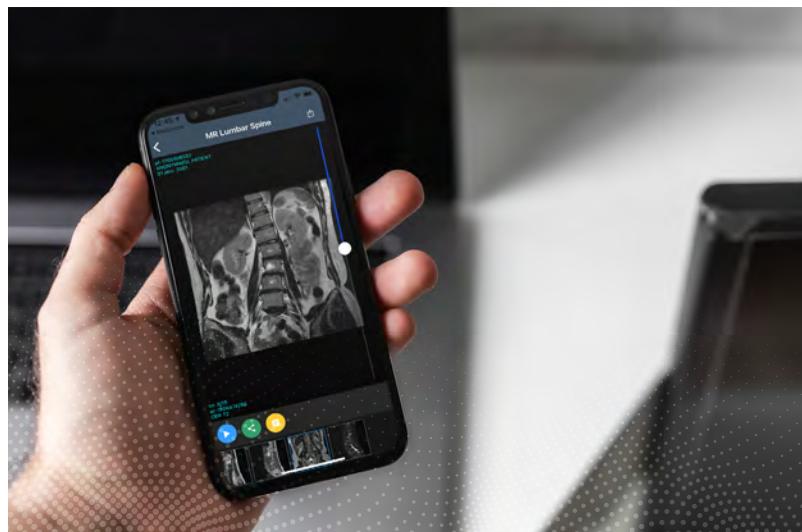
In 2021, **Australia's Services Exports Action Plan** was announced to promote an internationally competitive services sector that boosts Australian exports. This Plan sets out immediate actions to help Australia's economic recovery from the COVID-19 pandemic and long-term goals for strengthening the competitiveness of Australian service suppliers into the future, including through data flows, international rules and developing world-class skills and talent.

The **Digital Business Plan** provided measures to support the growth of the Australian fintech sector, including options to drive fintech adoption and expand the FinTech Bridge.

Case study

## TAKING AUSTRALIAN INNOVATION TO THE WORLD

Melbourne-based Zed Technologies shows how Australian digital health ideas can accelerate overseas growth. With a cloud-based service, the company has partnered with an Indonesian med-tech company for its cloud-based service to give patients access to their X-rays, MRIs, scans and ultrasounds through an app. Sharing medical images using the cloud isn't new, but what makes Zed Technologies unique is its focus on patients. The digital technology means patients don't need to carry physical scans around with them. It also means that specialists anywhere in the world can examine a scan and provide a remote diagnosis.



And with a trusted local partner, Zed Technologies is powering into one of the fastest growing medical-technology markets in Southeast Asia.

With a world-leading product, the company has been quick to grow overseas. From its genesis in 2012, Zed has scaled up, with Australian Government support, into new markets starting with Singapore, then Indonesia, and now into Europe. The company has grown over 30 per cent year on year and now delivers over 9 million scans a year to doctors and 3.5 million scans to patients.

## Growing, protecting and promoting Australia's critical and emerging technologies

Australia's international engagement seeks to shape the design, development and use of secure, resilient and trusted technology in line with Australia's values and interests. Our engagement is guided by core principles and values of human rights, rules of law, fairness, open competition, security, transparency, respect and integrity. Australia's **Ambassador for Cyber Affairs and Critical Technology**, guided by Australia's **International Cyber and Critical Tech Engagement Strategy**, has an important role in ensuring Australia benefits from the growth of a connected, prosperous and resilient Indo-Pacific enabled by safe and secure critical technologies. As an important participant in global economic, scientific and technology ecosystems, Australia will work with other nations to shape the ecosystems in a way that not only enhances our security and prosperity, but supports positive security outcomes for all nations.

Critical and emerging technologies have the capacity to significantly enhance Australia's national interests. Critical technologies are often enabled by and reliant on digital networks and can include technologies (or applications of technologies) such as Smart Cities, AI, 5G and next generation communications, IoT, quantum computing and synthetic biology.

To assist organisations – including governments and businesses of all sizes – in making decisions about trusted suppliers and the transparency of their own products, the Australian Government is also developing **Critical Technology Supply Chain Principles** in consultation with industry.

The Principles fall under the three pillars of transparency, security-by-design, and autonomy and integrity.

In 2019 the Australian Government released a set of voluntary **AI Ethics Principles** to encourage Australian organisations using AI systems to adopt and develop this technology in a transparent and safe way. Australia is one of 42 countries that have signed up to the OECD Principles on AI that sets out international standards to ensure these systems are designed to be robust, fair and trustworthy. Australia also committed to the **G20's Human Centred AI Principles**, released as part of the Ministerial Statement on Trade and Digital Economy in 2019.

Our participation in the **Global Partnership on AI** is also fostering international collaboration on the responsible use and development of AI.

## Next steps to 2030

Timeframe Trade and international engagement

Next 2 years	<ul style="list-style-type: none"><li>Engaging with Singapore on establishment of a fintech bridge which would include enhanced regulatory cooperation, support for fintech firms, and safe and secure data sharing</li><li>Implementing the AI Ethics framework for business and government</li><li>Implementing the 2021 International Cyber and Critical Technology Strategy</li><li>Critical Technology Supply Chain Principles incorporated into Australian Government decision making practices, as an exemplar for international partners and industry to securely develop and adopt critical technologies</li><li>The Quad Critical and Emerging Technology Working Group will continue work to ensure that critical and emerging technology is governed and operates according to shared interests and values</li></ul>
Next 5 years	<ul style="list-style-type: none"><li>Working with trade partners to support implementation of international commitments on digital trade, including in South East Asia</li><li>Negotiating high quality digital trade rules building on existing free trade agreements</li><li>Co-chairing the WTO Joint Statement Initiative on E-commerce and negotiating the first set of global digital trade rules</li><li>Progressive build and implementation of Regional Data Hub</li></ul>
By 2030	<ul style="list-style-type: none"><li>Australia's engagement in digital standards and international standard setting forums promotes our democratic values and technology that is secure-by-design</li></ul>



# EMERGING TECHNOLOGIES ARE OPENING NEW OPPORTUNITIES

Digital technologies and new business models will boost productivity, create jobs, solve the real-world problems of today and grow the businesses and sectors of tomorrow. We are using technology such as drones, robotics, 3D printing and blockchain now. By 2030 we would expect to see breakthroughs in emerging technologies that can transform the Australian economy. These are likely to include artificial intelligence (AI), quantum computing, nanotechnology, cognitive science, energy capture and storage, more connected devices through increased penetration of the Internet of Things (IoT), and the further advancement of existing technologies with undeveloped potential.

In addition, new technological fields may result from the convergence of different technologies. For example, where voice, data, video are brought together to share resources and interact.

Hyperautomation will combine AI, robotic process automation, machine learning and other automation technologies to create interoperable systems of automation. The increase in end-to-end automation will drive efficiency, streamline processes and prioritise higher value work.

Understanding how these technologies are developing and the potential applications and risks that need to be managed, is essential to delivering the right policy and regulatory settings to support uptake across the economy. The Government, through organisations like Data61 and the Centre of Excellence for Quantum Computation and Communication Technology, is building its capability to assess technology developments that keep Australia at the digital frontier.

By better understanding the technologies of today and preparing for the technologies of the future, Australia is well placed to embrace new opportunities.

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## KEY TECHNOLOGIES SHAPING AUSTRALIA'S FUTURE TO 2030



**Artificial Intelligence:** a collection of technologies that can be used to solve problems autonomously and perform tasks to achieve defined objectives, in some cases without the explicit guidance from a human being.



**Internet of Things:** the network of physical objects that are able to connect to the Internet.



**Data Analytics:** the analysis of raw datasets using specialised computers and software.



**Blockchain:** a software solution that allows data to be verified and stored in a distributed network, thereby reducing single points of failure, mitigating fraud, and enabling the automated execution of agreements via smart contracts.



**Quantum Computing:** storing and processing information by manipulating the behaviour of individual atoms, ions, electrons or photons.

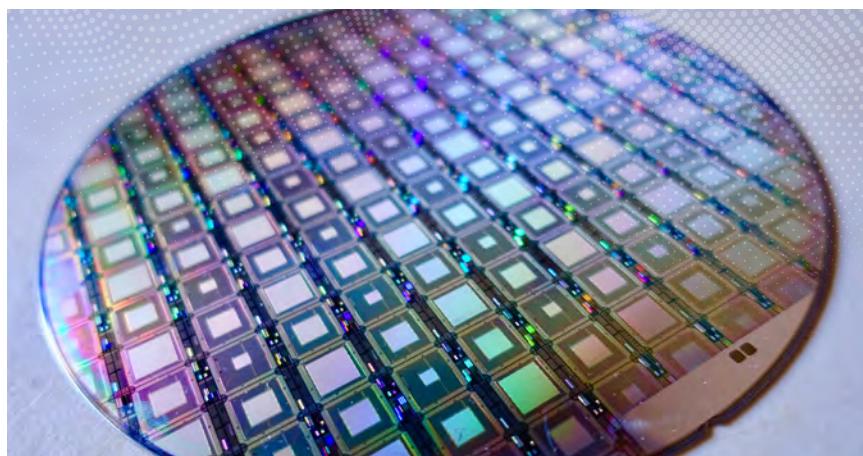
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## Case studies

# AUSTRALIAN BUSINESSES AT THE DIGITAL FRONTIER

## Cybersecurity using quantum

Canberra-headquartered QuintessenceLabs uses quantum physics to develop a suite of data security tools that strongly protect systems from cyber-crime. These tools are in use by major financial corporations, cloud providers, governments and defence agencies, across the globe, and include the world's fastest random number generator, advanced encryption key management and quantum key distribution to strengthen enterprise-scale encryption. QuintessenceLabs is also working on using quantum-encrypted communications in space. In 2018, QuintessenceLabs was selected by the World Economic Forum as a Technology Pioneer, for its work in quantum-based cybersecurity solutions.



## Leveraging blockchain for contracts

Piper Alderman has become the first Australian legal firm to execute a blockchain-based payment guarantee in a commercial contract, and may be the first law firm in the world to do it. Piper Alderman partnered up with Lygon, a blockchain business which includes CBA, Westpac, and ANZ as shareholders. Using Lygon fast tracks the bank guarantee issue, redemption and return process, cutting costly paper trails and effectively eliminating the risk of fraud. In 2018, Piper Alderman became one of the first major law firms to accept digital currencies for settlements of bills, leading the way in alternative payments for clients in the growing blockchain space.

## What has already been delivered?

New infrastructure, like 5G and further investment in the NBN, will provide significantly faster data transmission speeds and the increased development of IoT. The **Australian 5G innovation initiative** will fund small to large businesses to test and develop 5G uses, applications, services and products.

Improved data access and use will also enable new products and services to be developed that will transform everyday life, drive efficiency and safety, create productivity gains, and allow better decision-making. Data will power much of the transformative technology such as AI, machine learning and predictive analytics. Business models will need to adapt to the unification of data, personalised customer experiences, and cybersecurity. The **Consumer Data Right** will support innovative data-driven businesses to develop better products and services and increase Australia's productivity.

Australia is home to a number of world-first blockchain applications. Combining blockchain technology with other technologies can add economic value to a range of business sectors. The **National Blockchain Roadmap** highlights some of the enormous opportunities blockchain technology can enable across our whole economy and provides the signposts for the future development of this technology. The Digital Business Plan announced funding for **two blockchain pilots** that will demonstrate the technology's potential to reduce business compliance costs.

Quantum computing has the potential to transform the information economy and create the industries of the future – solving complex solutions in hours or minutes. Australian researchers have established global leadership in quantum information. The Government has funded the **Centre of Excellence for Quantum Computation and Communication Technology** (CQC<sup>2</sup>T), an international collaboration between seven Australian universities and more than 25 partners to form one of the largest combined efforts in quantum computation and communication research in the world. It has also co-funded an Australian quantum computing company—**Silicon Quantum Computing Pty Ltd** to produce a prototype quantum computer chip—the first step in building a fully-functional quantum computer.

## New investments for the next step change

The expansion of the world-leading **Consumer Data Right** will continue to strengthen the foundations of the data economy, while the **Australian Data Strategy** will explore how to enable a data-driven economy through improved economy-wide data sharing while embedding trust and security in data use. These initiatives will create new opportunities for data-driven businesses and technologies.

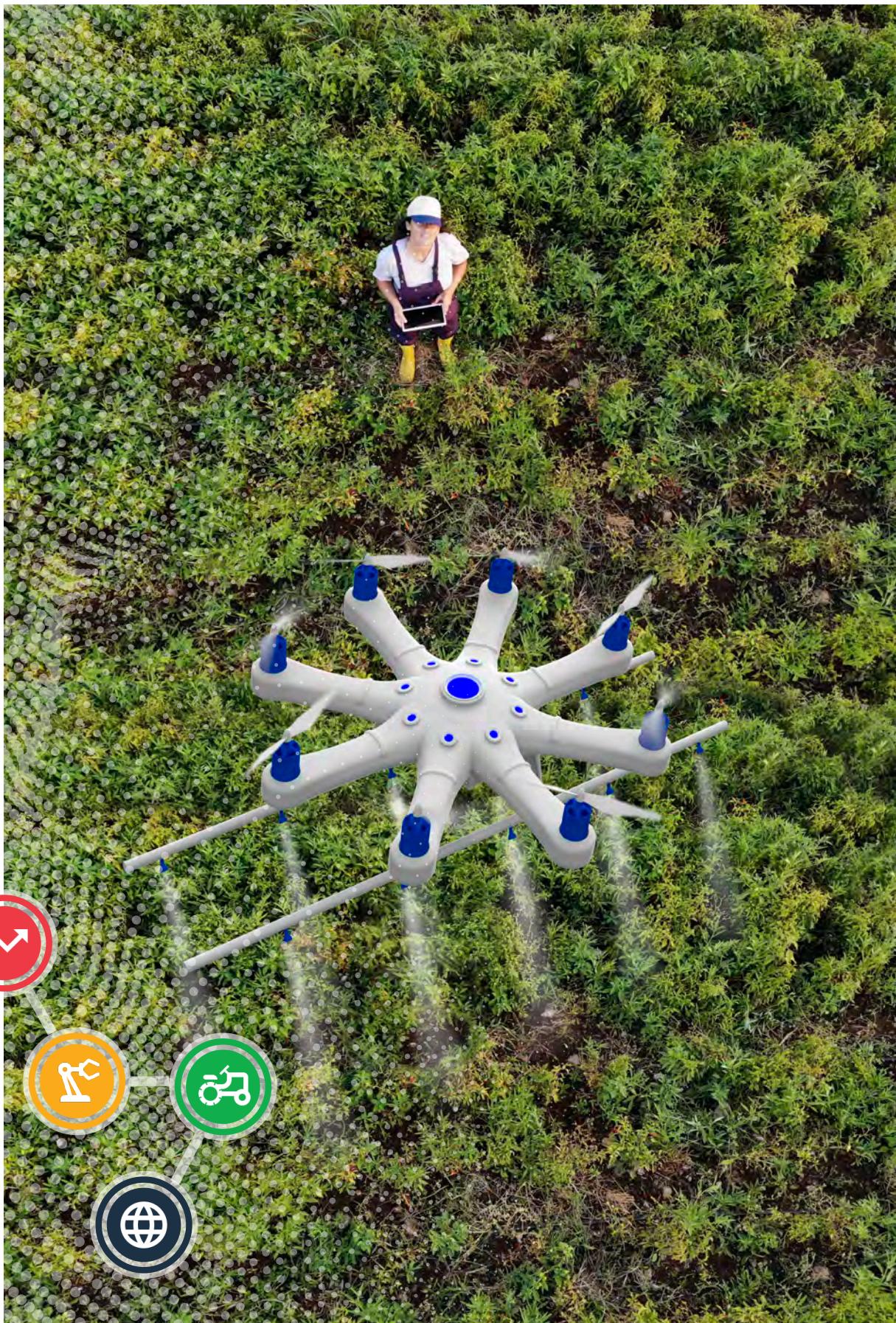
Australia is a world leader in computer vision, deep learning, field robotics, neural networks and machine learning. Only one other country in the world produces more AI research per capita than Australia.<sup>25</sup> These strengths provide a solid foundation for an AI-enabled economy.

The Government's \$124.1 million over six years for the **AI Action Plan** will set out the Government's plan to build Australia's AI capability to grow the economy, support industry competitiveness, create jobs and improve lives. This will include modernising manufacturing and farming activities, improving diagnosis and treatment of diseases, and enhancing our defence capabilities.

Emerging aviation technologies could add \$14.5 billion to GDP over the next 20 years, and create around 5,500 additional jobs.<sup>26</sup> The Government will partner with industry to deliver grants to support the use of **emerging aviation technologies** (such as electric engines, drones and electric Vertical Take-off and Landing (eVTOL) aircraft) to address priority community, mobility and cargo needs in regional Australia. These partnerships will be supported by improved regulation for these emerging technologies through the development of a **Drone Rule Management System** and **National Drone Detection Network**, working with other levels of government. We have also delivered a **National Emerging Aviation Technology Policy Statement**.

## Next steps to 2030

Timeframe	Emerging technologies
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>Increasing Australian business investment in digital technologies, including emerging technologies like AI</li><li>Implementing the National Blockchain Roadmap and blockchain pilots</li><li>Improving research collaboration and commercialisation to support the adoption of AI tailored to Australian needs across the economy</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>Increased domestic capability in key industry sectors including manufacturing, agriculture and defence</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>Digitally intensive industries will employ more than 10% of the Australian workforce</li><li>Australia is a global leader in the development and adoption of trusted, secure and responsible AI technology</li><li>More Australian sectors are operating at the digital frontier</li></ul>



# LIFTING OUR AMBITION: DIGITAL GROWTH PRIORITIES

Building on the investments to secure the foundations to grow the digital economy, the Australian Government has identified four priority areas for strategic focus where we can partner with the private sector to position Australia as a leading digital economy and society by 2030. These are:

- **Digital SMEs** – lifting digital capability and adoption across the economy to support new ways to work and do business. This will increase profitability and save businesses time.
- **Modern Industry sectors** – supporting globally competitive export sectors operating at the digital frontier, including manufacturing, mining, agriculture and construction.
- **Dynamic and emerging tech sector** – building emerging technology capability and accelerating the growth of tech start-ups in areas like fintech and regtech that can drive an uplift in the rest of the economy.
- **Digital government and services** – delivering simple, secure and trusted essential services for frictionless interactions.

## Digital SMEs

Prior to the COVID-19 pandemic, the *Small Business Digital Taskforce Report 2018* showed many SMEs struggled to understand how digital technology could generate growth and productivity benefits for their business. SME engagement with digital products was low, with only half of businesses having a web presence, 40 per cent using cloud services, and very few citing cyber security as a priority.<sup>27</sup>

Over 2020, the pandemic made it an imperative for many Australian SMEs to actively engage with digital technology to adapt to changed conditions. Nearly 9 in 10 Australian firms adopted new technologies to improve their business continuity during COVID-19, with 13 per cent recognising that technology tools were essential to their operations.<sup>28</sup>

Many businesses found these new digital channels opened up opportunities for growth and improved overall productivity.<sup>29</sup> Within one year, for example, Australian SMEs achieved more growth in web presence, use of digital payroll tools, and use of digital stock control processes than they had in the previous 10 years combined, and 37 per cent of the more digitally advanced firms increased productivity either slightly or significantly over this time.<sup>30</sup>

While more SMEs are beginning to take up digital tools, the gap between connected and disconnected businesses has deepened. The broader barriers identified in 2018 have not been eliminated. Micro-firms remain 75 per cent less likely to adopt digital technology to support

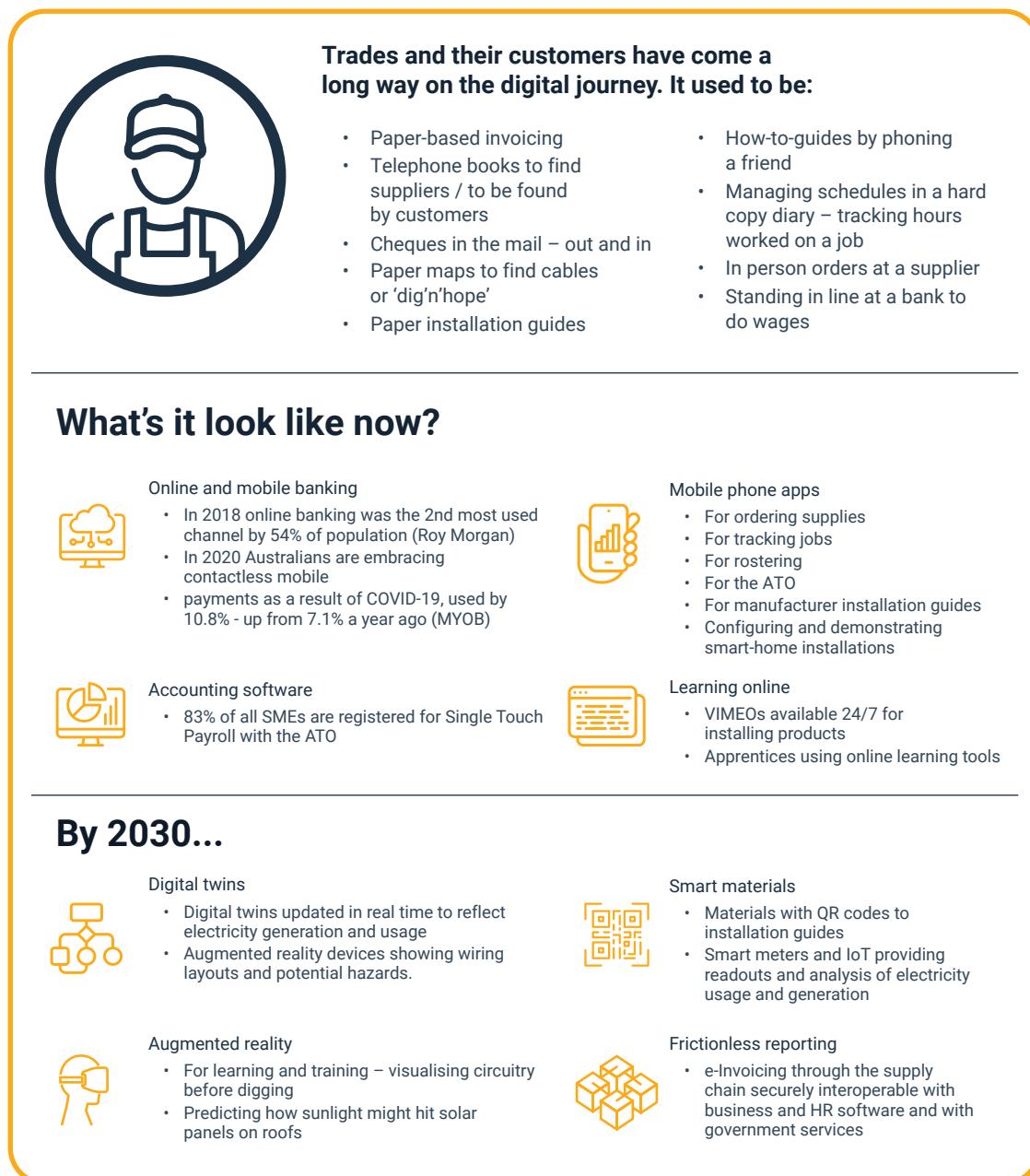
business processes like strategic planning, and less than 40 per cent of micro-and-small firms use digital tools to support planning, marketing or production processes.<sup>31</sup>

Many SMEs are unaware that digital technology is a function that can define the pathway towards a solution. Despite the depth of support available from both the private sector and across government, many firms continue to face ongoing challenges when considering digital adoption.

Over the next decade, the Government will focus on lifting digital capability and adoption across the economy to support new ways to work and do business, increasing profitability and saving time.

Figure 8

### Electrical business digital transformation journey



## What has already been delivered?

Since 2018, the **Australian Small Business Advisory Services** program has helped around 22,000 small businesses on their digital journey. The Government committed an additional \$9 million in the 2020-21 Budget to extend the program to provide low-cost independent, expert and tailored advice to an additional 10,000 small business.

The **Digital Readiness Assessment Tool** provides tools, advice and information for businesses to understand where they are in their digital journey while the **Small Business Digital Champions Project** provided free sector-specific digital advisory services covering topics such as technology trends, adoption, hardware, software, cyber security, digital training, planning and support. The Government is also working with big businesses to identify what they can and will do to support their **SME partners** along the digitalisation journey.

## New investments for the next step change

The Government is empowering businesses to grow investment in digital technologies by allowing taxpayers to **self-assess the effective life of certain intangible assets**, which would better match the tax treatment of such assets with the period of time they provide economic benefits to the taxpayer.

An expanded **Digital Solutions – Australian Small Business Advisory Service** will provide \$12.7 million to provide high-quality, low cost, independent advice to 17,000 Australian small business in 2021-22. This funding extends the 2020-21 expansion for a further year to assist small businesses to build their digital capabilities, use digital technologies and build business continuity and resilience. The expansion of this program includes a pilot program servicing not-for-profit organisations.

The **Digital Business-to-Business Partnerships** initiative capitalises on the trusted relationships that Australia's corporate sector has with SMEs to promote the adoption, use and access to digital products and services. Through a public commitment a number of leading Australian businesses and industry associations will pledge to directly and actively support SMEs in their digital transformation.

## Next steps to 2030

Timeframe	Digital SMEs
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>• Work with stakeholders to lift business-to-business partnerships that encourage SMEs to build digital capability through existing or new digital products and services</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>• e-Invoicing is adopted across the private sector and more businesses process payments online</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>• All new businesses are born digital</li><li>• 95% of all SMEs have a digital presence or are using digital processes.</li></ul>

# Modern industry sectors

To compete in increasingly globalised markets, Australian businesses need to grow their use of digital technologies, infrastructure and services and build their digital capability or risk falling behind their international counterparts. Enabling technology solutions and uptake across all Australian sectors will unlock productivity gains and create new products, markets and industries, growing Australia's jobs, income and export opportunities.

Every sector has a lot to gain from using digital tools. For example, the mining sector is adopting automation, software, robotics and data analytics to improve supply chain efficiencies and enhance safety.

Over the next decade, the Government will focus on supporting globally competitive export sectors operating at the digital frontier, including manufacturing, mining, agriculture and construction.

## What has already been delivered?

The **Modern Manufacturing Strategy** is designed to ensure Australian manufacturers scale-up, become more competitive and more resilient. By making strategic investments and harnessing Australia's world-class science and research, we are opening up new markets to export high-quality products to the rest of the world. As demonstrated in Figure 9, the adoption of digital tools will be an important contributor to achieve this uplift.

The **Defence Transformation Strategy** include a focus on strengthening Defence's approach to Australian industry capability, including innovation, export and harnessing opportunities from Australian science and technology.

Australia's **Technology Investment Roadmap** is a strategy to accelerate development and commercialisation of low emissions technologies.

## New investments for the next step change

The **Agriculture 2030** package will drive productivity through innovation, encourage private sector investment and strengthen Australia's biosecurity systems. The digital technologies used in screening for pests that could harm Australia's agricultural production will be enhanced and the capability of the sector to adopt digital tools will be improved through better skills and data.

The Government is investing in the rollout of the **National Freight Data Hub** following extensive consultation and testing. By improving national freight data industry and governments can plan, make better operational and investment decisions and be more resilient and responsive.

## Next steps to 2030

Timeframe	Modern industry sectors
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>• Work with stakeholders including State and Territory governments to identify ways to lift sectors where digitalisation can drive greater productivity</li><li>• Launch of full Freight Data Hub with enhanced freight data, insights, project and standards information</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>• Innovative products and technologies are being developed and adopted within Australian sectors including manufacturing, agriculture and defence</li><li>• Origin and traceability systems are enhanced to provide quality assurance of Australian goods in global markets</li><li>• Through implementation of the Modern Manufacturing Strategy, Australian manufacturers are collaborating and using smart manufacturing to respond to new and emerging opportunities, consumer trends and market demands</li><li>• Enhanced cross-sector collaboration on technology adoption</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>• Digitally intensive industries will employ more than 10% of the Australian workforce</li><li>• More Australian sectors are operating at the digital frontier</li></ul>

Figure 9

## Digital economy aligning with the National Manufacturing Priorities

# Digital Opportunities: National Manufacturing Priorities



### Foundations to grow the Digital Economy

- Infrastructure – NBN, 5G, Regional Connectivity
- Skills – data analysts, software and web developers
- Systems and regulation
- Safety and security
- Trade and international engagement

### Aligning with:

- \$1.5 billion Modern Manufacturing Strategy, including the \$1.3 billion Modern Manufacturing Initiative grants.
- Helping Australian manufacturing to scale-up, become more competitive and resilient.
- Making science and technology work for industry by backing digital transformation



### Emerging technology opening new opportunities

- AI, IoT, data analytics, blockchain, quantum computer



### Growing our ambitions

- Digital SMEs
- Modern industry sectors
- Dynamic and emerging tech sector
- Digital government and services

The Modern Manufacturing Strategy supports getting the economic conditions right for manufacturers, including settings that support use of digital technologies. Future growth opportunities have been identified across the six National Manufacturing Priorities. Many of these opportunities recognise that further use of digital technologies will enable scale, competitiveness and resilience in Australian manufacturing.

<b>Medical Products opportunities</b> <ul style="list-style-type: none"> <li>Digitally integrated products and platforms, including digitising existing medical products, emerging data-driven products and advanced manufacturing.</li> <li>Using smart medical devices, and analysing the data generated, to make better health decisions.</li> <li>Using data analytics, robotics and automation to produce high-value medicines and cutting edge treatments</li> </ul>	<b>Food &amp; Beverage opportunities</b> <ul style="list-style-type: none"> <li>Smart manufacturing, such as:           <ul style="list-style-type: none"> <li>AI and advanced data analysis in automation of continuous and batch control systems</li> <li>AI and robotics in logistics/distribution chains (e.g. high speed palletising)</li> <li>AI, big data and advanced analytics to monitor systems (e.g. temperature).</li> </ul> </li> <li>Food safety, origin and traceability systems. For example, big data to develop standardised digital labelling for instant information about products across markets.</li> </ul>	<b>Space opportunities</b> <ul style="list-style-type: none"> <li>AI and big data for product, systems and subsystems design, production and testing</li> <li>IoT devices for space</li> <li>Robotics and automation demonstration platforms for space</li> </ul>
<b>Recycling and Clean Energy</b> <ul style="list-style-type: none"> <li>Products that embed data collection, forecasting, automation, controllability and cybersecurity functions, to support increasingly distributed energy systems</li> <li>Supporting more efficient material recovery through AI, automation and sensor networks</li> <li>Traceability technologies supporting 'green' products, like barcodes, blockchain and digital product passports</li> </ul>	<b>Resources Technology &amp; Critical Minerals Processing</b> <ul style="list-style-type: none"> <li>Using AI and data analytics for automated vehicles, robotic equipment, predictive maintenance</li> <li>Predictive data for monitoring environmental impacts</li> <li>Using AI and automation to develop technology that recovers waste from mine tailings</li> <li>Technologies that help to certify point of origin.</li> </ul>	<b>Defence opportunities</b> <ul style="list-style-type: none"> <li>Developing and manufacturing energetic materiel, using current technologies and future alternatives.</li> <li>Integrating tactical sensor hardware and software with host platforms, sensors and control systems.</li> <li>Integrating emerging tech for ADF priorities such as virtual reality simulation for military training and advanced algorithms for high frequency sensors used for surveillance.</li> </ul>
<p><b>Cross cutting</b></p> <ul style="list-style-type: none"> <li>Using AI and robotics to increase efficiency of manufacturing, and enable Australia to better compete on value</li> <li>Using IoT to enable high value-added after-sales service</li> <li>Developing cyber-security capabilities complementary to this</li> <li>Using AI, big-data and data analytics to identify opportunities to collaborate with local firms engaged in similar or complementary activities</li> <li>Increase business awareness of the benefits of digitisation and developing tools and programs to support businesses.</li> </ul>		
<p><b>Supply chain resilience</b></p> <ul style="list-style-type: none"> <li>Using big data and advanced data analytics to analyse exposure to risks and identify potential shortages of critical supplies</li> <li>Introducing barcoding and labelling standards to improve integration of digital supply chain systems and decrease operating costs</li> <li>Using digital solutions, such as digital control towers or blockchain, to improve transparency of supply chains and inventories</li> </ul>		

# Dynamic and emerging tech sector

Australia's technology sector is an important enabler for a modern and digital economy. The sector helps to build Australia's skills base by delivering well-paid, highly skilled jobs, and supports innovation and productivity in almost every other sector through the development and adoption of tailored technology solutions. It also delivers value to Australians by improving the quality of service delivery in a range of applications from online banking, contactless payments and online entertainment through to accessing government services.

Australia has a strong history of developing new technologies, which have generated huge economic and social benefits worldwide. Some of these include Wi-Fi, polymer banknotes, the cochlear implant (bionic ear) to assist with hearing, spray-on skin for burns victims, pacemakers, Google Maps and the flight recorder blackbox that helps keep commercial air travel safe. Australia has organic growth in fintech, regtech, agritech and creative industries like game and film production.

Overall, the sector is comparatively small relative to other economies and there is significant room to grow. Innovation and investment in this sector has been stalling and new ideas are not regularly translated into commercial outcomes.

Over the next decade, the Government will focus on building emerging technology capability and accelerating the growth of tech start-ups in areas like fintech and regtech to drive an uplift in the rest of the economy.

## What has already been delivered?

The Government invested an additional \$2 billion through the **Research and Development Tax Incentive** in the 2020-21 Budget to help innovative businesses that invest in R&D. Business investment in R&D is central to the development of new products, processes and services that will help make Australia more competitive and create more jobs in the long-term.

Building on Australia's strong financial services foundations, the Australian Government is providing a supportive policy environment that will allow the **fintech** sector to grow. Australia's fintech industry has a reputation for quality and diverse product offerings and is maturing at a rapid rate. The CDR, Enhanced Regulatory Sandbox and the UK-Australia FinTech Bridge enable safe data sharing, innovation across borders and support for the flourishing Australian fintech ecosystem, which included more than 730 active fintechs in 2020.<sup>32</sup> The Fintech100 report nominated seven Australian firms as being among the best fintech innovators from around the world.<sup>33</sup>

The **National Blockchain Roadmap** will drive the long-term development and adoption of this technology in Australia. The Digital Business Plan announced funding for **two blockchain pilots** that will demonstrate the technology's potential to reduce business compliance costs.

The **National Transport Technology Action Plan** outlines Australia's priorities for implementing new transport technologies, which have been developed in partnership with the states, territories and industry.

## New investments for the next step change

Better and smarter use of data can improve performance, reduce overheads and create value for customers. Businesses using AI are performing 11.5 per cent better than those who are not.<sup>34</sup> Despite this enthusiasm, Australia is estimated to be about 34 per cent behind global peers in realising the economic benefits of digital innovation. In the 2021-22 Budget the Australian Government's \$124.1 million **AI Action Plan** will help Australia maximise the benefits of AI for all Australians and manage the potential challenges. These investments will also support digital SMEs and modern industry sectors. Under the plan we are investing:

- \$53.8 million to create the **National Artificial Intelligence Centre** that will drive business adoption of AI technologies by establishing up to four strategic AI and Digital Capability Centres that will provide SMEs with a 'front door' for AI talent, knowledge and resources. Coordinated by CSIRO's Data 61, the Centre will support the development of new AI solutions with a commercial application by linking our leading AI researchers with firms able to commercialise that research into high-end products and services.
- \$33.7 million to support six industry pilots under **AI solutions to build a stronger Australia** for businesses to partner with government to develop AI-based solutions to challenges that have significant spill-over benefits for job creation, economic recovery and other social benefits.
- \$24.7 million in the skills of the future by establishing the **Next Generation AI Graduates Program** that will attract and train home-grown, job-ready AI specialists through competitive national scholarships.
- \$12 million to support exemplar applications of **AI that will catalyse the AI opportunity in our Regions** by co-funding 36 competitive grants for AI opportunities to be deployed to help solve local or regional problems.

In the 2021-22 Budget the Government will partner with other levels of government and industry to deliver \$32.6 million in grants to support the use of **emerging aviation technologies** (such as electric engines, drones and electric Vertical Take-off and Landing aircraft) to address priority community, mobility and cargo needs in regional Australia. These partnerships will be supported by improved regulation through the development of a **Drone Rule Management System** and **National Drone Detection Network**.

The Government is also providing tax support through the 30 per cent refundable **digital games tax offset** that will make Australia an attractive destination for digital talent and grow a viable export industry. With support, the Australian games industry could generate up to \$1 billion per year and employ 10,000 full-time workers within the decade.<sup>35</sup> Gaming sector talent has transferable digital capabilities that Australia could apply to range of sectors, including defence, health, education and construction. Consultation with industry in mid-2021 will inform the criteria and definition of qualifying expenditure to support the development of digital games.

#### Case study

### A MIGHTY KINGDOM OF DIGITAL CAPABILITIES

Mighty Kingdom has created games for some of the world's leading toy and entertainment giants, including Disney, LEGO, Australian Red Cross, Sony, Funcom, Rogue, and Snapchat. The South Australian company employs 120 people.



The company successfully listed on the Australian Securities Exchange in 2021 and is one of few Australian-based games companies listed. Mighty Kingdom operates in the global gaming market, which is forecast to reach US\$200 billion by 2023. The company also actively supports Adelaide's games ecosystem, building skills and attracting local and international investors.

To support Australian companies to engage and retain the talent they need to compete on a global scale, the Government will ensure that employees that receive a tax-deferred **Employee Share Scheme** do not become subject to tax when their employment ceases. Employee Share Schemes are particularly important for businesses that are unable to offer competitive wages during their growth stage.

The Australian venture capital market is currently supported by tax incentives designed to attract foreign investment and encourage venture capitalists to invest in early-stage Australian companies to drive innovation and additional investment. The Government will undertake a review of **venture capital tax concessions** to ensure current arrangements are fit-for-purpose and support genuine early-stage Australian start-ups.

## Next steps to 2030

Timeframe	Dynamic and emerging tech sector
<b>Next 2 years</b>	<ul style="list-style-type: none"><li>Completing two industry-led pilots that demonstrate the application of blockchain technology to reduce regulatory compliance costs and encourage broader take up of productivity boosting blockchain technology by Australian businesses</li><li>Reviewing Australia's readiness for automated road vehicles with a focus on trials, regulation, infrastructure and public attitudes in collaboration with States and Territories</li><li>RegTech Commercialisation Initiative – deliver four challenges and up to eight proof of concepts</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>Establishing a national automated vehicle (AV) regulatory framework to enable the safe and legal operation of AVs on Australia's roads</li><li>Develop the next iteration of the National Land Transport Technology Action Plan (2024-2027) to operationalise a national coordinated approach for deploying digital technologies for land transport in collaboration with States and Territories</li><li>Ensure tax concessions continue to be fit-for-purpose to encourage start-ups and venture capital in Australia</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>Increased GVA value contributed by tech businesses launched in Australia</li><li>Australia is a global leader in the development and adoption of trusted, secure and responsible AI technology</li></ul>

# Digital government and services

Digital technology is changing how people and businesses interact with government to access essential services. Only a few years ago, we operated in a world where tax returns were lodged on paper forms, Medicare claims were made in person, and reporting income to Centrelink required regular phone calls. Today more services are completed online, and information already held by the Government is used to help complete applications for new services. COVID-19 demonstrated the benefit of Government adopting digital solutions for a range of issues including procurement, service delivery, regulation and policy making.

Australians rightly expect continuous service improvements from government in the same way they do from their banks, telecommunication provider and any other service providers. Australia already performs well in government service delivery relative to other countries. Australia was second for E-Government in the IMD's 2019 Digital Competitiveness rankings and fifth in the UN's 2020 E-Government Survey. We also rank second on the open data index. However, there is always room for improvement.

To allow business-led growth it will be essential to continue to lower regulatory barriers to investment. Modernising regulation, whether around competition, consumer protection, finance, safety or security will remove the hand brake on innovation. Through smart regulatory design and working with the sector, Australia can open up new economic opportunities while ensuring the benefits of the digital era deliver broader public benefit.

Given digital technologies allow easier access to international markets it will be important to continue to open, and advocate for the benefits of, global markets and the rules-based trading system.

Over the next decade, the Government will focus on delivering simple, secure and trusted essential services for frictionless interactions.

## What has already been delivered?

**myGov** was introduced to make it easier for Australians to access their personal government services. It is now the Australian Government's largest and most recognised government platform, with approximately 500,000 logins each day and more than 19.8 million active myGov accounts. myGov provides access to multiple services with one login: My Health Record, the National Disability Insurance Scheme (NDIS), Medicare, myTax, Centrelink, Child Support, Australian Job Search, Department of Veterans' Affairs, HousingVic Online Services and National Redress Scheme and My Aged Care.

**Digital Identity** will give Australian people and businesses a single, secure way to use government services online. Creating a Digital Identity is like doing a 100-point identification check. It removes the need to visit a shopfront with your identity documents. Digital Identity is already being used by over 2.3 million Australians and 1.2 million businesses to access over 75 government services. Digital Identity ensures personal information is securely encrypted and stored in Australia and no personal information is presented through a double blind system. The proposed new legislation for the Digital Identity system will extend these protections and standards to businesses and state and territory governments who will use the digital identity.

Delivering on the **Government's Deregulation Agenda** through simple changes to complex processes, for example, joining up services in the Therapeutic Goods Administration to provide an estimated \$2 million per year in reduced compliance costs. This change helps ensure Australians have the quickest possible access to medicines and medical technologies. Sponsors will now be able to use an electronic database with automatic data transfer – saving them up to 15 minutes per report. Early childhood education and care approval processes were also streamlined by merging the application process to meet requirements under both Commonwealth and state government law. The change will save 5,100 hours per year for prospective applicants for the Commonwealth's Child Care Subsidy - a reduction of 75 per cent on current processing times.

#### Case study

### DIGITAL RECORDS SAVING LIVES

The Royal Flying Doctor Service (RFDS) provides emergency and primary health care services for those living in rural, remote and regional areas of Australia who cannot access a hospital or general practice due to the vast distances of the Outback. As an online summary of key health information, the My Health Record system can assist overcoming this geographical barrier. Where an individual has a My Health Record, RFDS can access this electronic record, removing the need for paper based patient information. Information in a patient's My Health Record could include details such as discharge summaries, medication and pathology and radiology reports performed elsewhere when providing both emergency and ongoing treatment.

RFDS clients receiving specialist services at tertiary hospitals in metropolitan centres are sometimes under considerable stressors such as leaving community, minimal social supports and dealing with new life changing health diagnosis.

That's where access to My Health Record becomes invaluable - the chronic disease coordinator from the RFDS may be able to access this information through My Health Record when providing care back in the remote community.

The ability of the My Health Record system to provide health care information whenever and wherever it is needed is supporting the RFDS and Australians living in regional and rural areas.



## New investments for the next step change

The Government is making a further \$200.1 million investment in **myGov** to better connect and deliver essential government services by streamlining and tailoring online interactions for individuals and businesses. The enhancements will improve the functionality of myGov, making it easier and faster for people to engage with government. It will deliver smart and personalised interactions with government – allowing Australians to see a summary of all their interactions with government in one place, reminders to lodge returns or report income and proactive identification of services based on life events.

The Government is further investing in the infrastructure to digitally enable health care in Australia through the next wave of **My Health Record**. This will support innovation in health technology to safely and securely integrate new functions. In addition, by leveraging connection and digitisation, older Australians will be better supported when moving between care environments as their health information will follow them digitally. Australia will be one of the first countries in the world to enable its people to truly hold their healthcare in their hand, providing for a richer experience and interaction with healthcare services.

The **Digital Transformation Agency** has a refocused mandate and will be better able to add value across the APS through a transfer to the Department of the Prime Minister and Cabinet. Its functions have also been updated to deliver strategic and policy leadership on whole-of-government and shared ICT investments and digital service delivery.

Through the **Deregulation Agenda** the government will continue to build foundations for future regulatory reform work, supporting innovative digital solutions and best practice approaches to regulation that benefits Australians.

## Next steps to 2030

Timeframe Lifting our ambition: Digital government and services

<b>Next 2 years</b>	<ul style="list-style-type: none"><li>• Complete core build of the Identity Management Services including APIs for integrating with the Permissions Platform</li><li>• Refresh of the Digital Transformation Strategy to reflect changing expectations of government service delivery and keep accelerating the transformation of government</li><li>• Release of the <i>Commonwealth Digital Health Blueprint 2030</i> that will direct and prioritise the Commonwealth's substantial investment in digital health initiatives to support national long-term health priorities and critical needs identified by healthcare providers and consumers</li><li>• Refresh of the National Digital Health Strategy that sets out agreed priority areas and to support the national health priorities</li></ul>
<b>Next 5 years</b>	<ul style="list-style-type: none"><li>• More government services available through myGov as it becomes a whole-of-government, end-to-end service delivery platform</li></ul>
<b>By 2030</b>	<ul style="list-style-type: none"><li>• Increasingly frictionless government service delivery</li><li>• All Australian Government services securely available online</li><li>• Significant majority of Australians over 18 are registered for myGovID or another trusted digital identity</li></ul>

# KEY INVESTMENTS IN THE 2021-22 BUDGET

In the 2021-22 Budget the Government is continuing to invest in strengthening foundational settings and providing targeted funding for digital growth priorities.

As digital technologies become a more important driver for all Australian businesses and sectors, a more co-ordinated approach to developing relevant policies and regulation will ensure greater success.

## Digital Economy Strategy – Summary of 2021-22 Budget measures

Measure	Investment
<b>Right foundations to grow the digital economy</b>	
Peri-Urban Mobile Program to fund new mobile solutions	\$16.4 million
Continuing Measuring Broadband Australia	\$7.7 million
Securing Australia's future mobile networks	\$31.7 million
Delivery of a National Data Security Action Plan	\$1.8 million
Expanding the Cyber Security Skills Partnership Innovation Fund	\$43.8 million
Strengthening Australia's national system of identity settings	\$2.8 million
Cyber Hubs pilot	\$18.8 million
Digital Skills Cadetship Trial	\$10.7 million
Accelerating the adoption of electronic invoicing	\$15.3 million
Accelerated rollout of the Consumer Data Right	\$111.3 million

<b>Measure</b>	<b>Investment</b>
Delivering a Digital Atlas	\$40.2 million
Enhanced management of Government data assets	\$16.5 million
<b>Building capabilities in emerging technologies</b>	
Establishing a National Artificial Intelligence (AI) Centre and AI and Digital Capability Centres	\$53.8 million
AI-based solutions to solve national challenges grants	\$33.7 million
Catalysing AI in our regions grants*	\$12.0 million
Next Generation AI Graduates Program^	\$24.7 million
Next Generation Emerging Technology Graduates Program^	\$22.6 million
Emerging Aviation Technology Partnerships grants	\$32.6 million
New Drone Rule Management System	\$1.6 million
Developing a National Drone Detection Network	\$1.5 million
<b>Lifting our ambition – Digital Growth Priorities</b>	
Allowing taxpayers to self-assess the effective life of depreciating intangible assets	\$170.0 million
Expanding and enhancing the Digital Solutions - Australian Small Business Advisory Services program	\$12.7 million
Introducing a digital games tax offset	\$18.8 million
Enhancing myGov	\$200.1 million
Enabling next-wave My Health Record	\$301.8 million
<b>Total</b>	<b>\$1.2 billion</b>

Note: Measures reflect funding over the forward estimates to 2024-25 unless otherwise specified

\*Measure reflects investment to 2025-26

<sup>^</sup>Measures reflect investments to 2026-27



# TRACKING PROGRESS TO 2030

The Digital Economy Strategy sets out how Australia will be a modern and leading digital economy and society by 2030. The Government's \$2 billion investment over the last two Budgets are building the foundations for the digital economy, building capability in emerging technology and setting digital growth priorities.

In tracking progress to 2030 we will be guided by the following:

- Government must be an exemplar in its own delivery of services, and seize the opportunities afforded by data and digital technology.
- Government must act with partners – exemplified by lessons learned during COVID-19 where business came to government offering support and assistance.
- Focusing on delivering for the future and preparing ourselves for how data and digital technologies can be applied to solve the challenges ahead of us.
- Data and digital must be underpinned by security and trust. By embedding security and trust into all we do, better services will be delivered for Australians. This will cement our international reputation as a trusted partner with people-centred values.

The work to plan and prepare for a digital future does not end with the Digital Business Plan nor the package of measures under the Digital Economy Strategy. There is a breadth and depth of work underway across government that means the Digital Economy Strategy will continue to evolve.

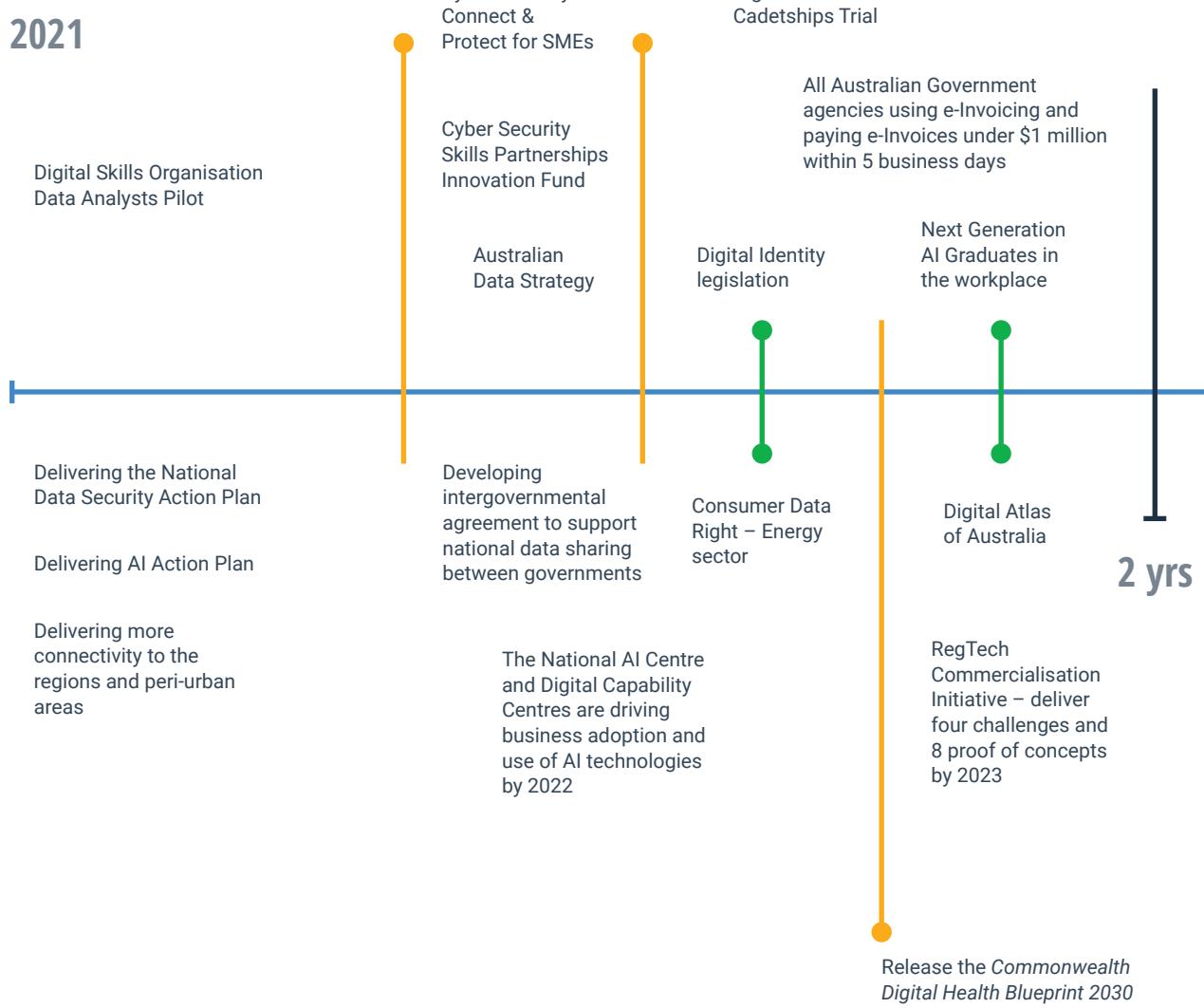
To support this work, the Government is extending the Digital Technology Taskforce. The Taskforce will monitor implementation of the Strategy as well as developments in emerging technologies to inform policy and regulatory development.

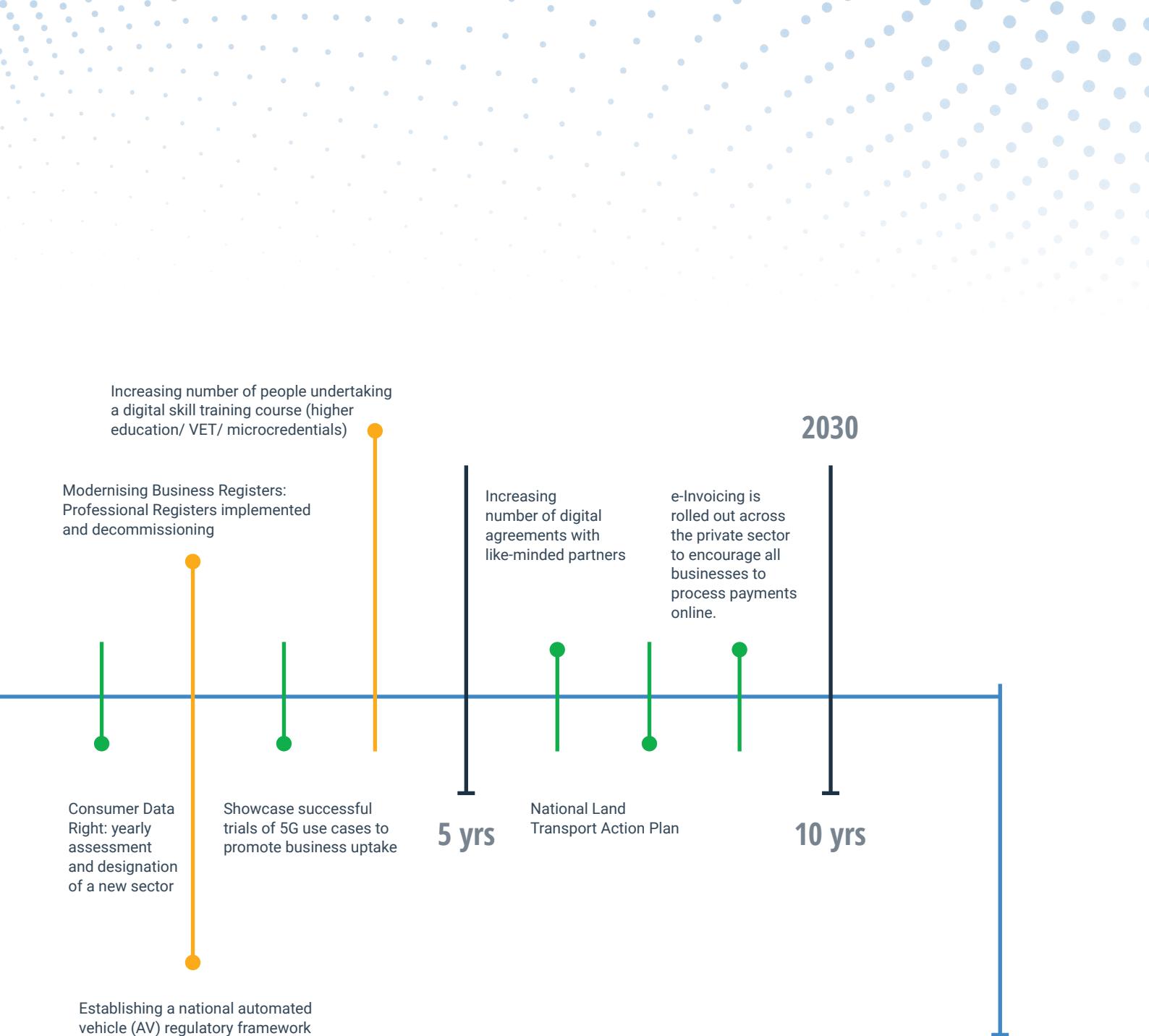
The Strategy lays out a vision of what a digital Australia may look like in 2030 and what the role of government will be to enable, incentivise, build capabilities, and deliver its services. To be a leading digital economy and society by 2030, Australia will need to grow its digital capabilities, for our jobs, for our people, and to be able to move above and beyond whatever comes next.

There is a lot already in train as the roadmap following shows. It will be important to track progress across government in delivering on the vision as well as through the ambitions, indicators and targets in the Strategy. We will learn more as measures are delivered and digital technologies advance.

The Digital Economy Strategy will be a living Strategy and will continue to evolve to ensure we remain on track and be adjusted where needed.

# Roadmap to 2030 and measures of success





## Measures of success

All Australian businesses continue to improve cyber security practices.

Tertiary advanced digitally skilled graduates increase to more than **15,000** per year

Digitally-intensive industries employ more than **10%** of the Australian workforce

All new businesses are 'born' digital

**95%** of SMEs are using e-Commerce tools

**100%** of Australian Government services are available online

# REFERENCES

1. Alphabeta (2018) *Digital Innovation: Australia's \$315b opportunity*, [https://alphabeta.com/wp-content/uploads/2018/09/csiro-data61\\_digital-innovation-report.pdf](https://alphabeta.com/wp-content/uploads/2018/09/csiro-data61_digital-innovation-report.pdf); Telstra and PwC (2021) *Be What's Next. Embracing the Digital Economy in Australia*, <https://www.telstra.com.au/business-enterprise/news-research/research/the-digital-economy-report>
2. McKinsey (2020) The COVID-19 recovery will be digital: A plan for the first 90 days, <https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/the-covid-19-recovery-will-be-digital-a-plan-for-the-first-90-days#>
3. Microsoft and Alphabeta (2020) *How technology strengthened Australian business during COVID and beyond*, <https://news.microsoft.com/en-au/features/accelerated-digital-adoption-shields-firms-from-pandemics-worst-helps-keep-3-2m-australians-working/>
4. Organisation for Economic Co-operation and Development (OECD) (2020), *Value added by activity*, <https://data.oecd.org/ratincome/value-added-by-activity.html>
5. OECD (2020) *OECD Going Digital Toolkit: Digital-intensive sectors' share in total employment*, <http://goingdigital.oecd.org/indicator/41>
6. OECD (2020) *OECD Going Digital Toolkit: Share of small businesses making e-commerce sales in the last 12 months*, <http://goingdigital.oecd.org/indicator/21>
7. OECD (2020) *ICT Access and Usage by Households and Individuals: ICT Access and Usage by Individuals*, [https://stats.oecd.org/Index.aspx?DataSetCode=ICT\\_HH2](https://stats.oecd.org/Index.aspx?DataSetCode=ICT_HH2)
8. OECD (2020) *Graduates by field*, [https://stats.oecd.org/Index.aspx?DataSetCode=EDU\\_GRAD\\_FIELD](https://stats.oecd.org/Index.aspx?DataSetCode=EDU_GRAD_FIELD) (note: includes short-cycle tertiary, Bachelor's, Master's, Doctoral levels or equivalents)
9. OECD (2015) *OECD Going Digital Toolkit: Share of adults proficient at problem-solving in technology-rich environments*, <http://goingdigital.oecd.org/indicator/24>
10. Economist Intelligence Unit (2021) *The Inclusive Internet Index*, <https://theinclusiveinternet.eiu.com/explore/countries/AU/performance/indicators/overall?year=2021>
11. United Nations (2020) *2020 United Nations E-Government Survey*, <https://www.un.org/development/desa/publications/publication/2020-united-nations-e-government-survey>
12. Open Knowledge Foundation (2017) *Global Open Data Index*, <https://index.okfn.org/place/>
13. International Telecommunications Union (ITU) (2018) *Global Cybersecurity Index 2018*, [https://www.itu.int/dms\\_pub/itu-d/opb/str/D-STR-GCI.01-2018-PDF-E.pdf](https://www.itu.int/dms_pub/itu-d/opb/str/D-STR-GCI.01-2018-PDF-E.pdf) (note Canada was equal 9th with Norway)
14. Bureau of Communications, Arts and Regional Research (2020) *Measuring the digitalisation of Australia's economy 2012–13 to 2016–17* <https://www.communications.gov.au/departmental-news/measuring-digitalisation-australias-economy-2012-13-2016-17> and (2020) *Affordability of communications services for low income households*, <https://www.communications.gov.au/publications/affordability-communications-services-low-income-households>

15. Visual Capitalist (2019) *A Visual History of the Largest Companies by Market Cap (1999-Today)*, <https://www.visualcapitalist.com/a-visual-history-of-the-largest-companies-by-market-cap-1999-today/>
16. Australian Bureau of Statistics (ABS) (2018) *Household use of information technology 2016-17 financial year*, <https://www.abs.gov.au/statistics/industry/technology-and-innovation/household-use-information-technology/latest-release>
17. ABS (2018) *Internet Activity, Australia*, <https://www.abs.gov.au/statistics/industry/technology-and-innovation/internet-activity-australia/latest-release>
18. Bureau of Communications, Arts and Regional Research (2020) *Demand for fixed-line broadband in Australia 2018-2020 Working Paper*, <https://www.communications.gov.au/publications/demand-fixed-line-broadband-australia-2018-2028-fact-sheet>
19. Telstra (2021) 5G, <https://www.telstra.com.au/5g> (note: based on one mobile network only)
20. Department of Education, Skills and Employment (2021) *Higher Education Data - uCube*, <http://highereducationstatistics.education.gov.au/>
21. ABS (2011) *Business Use of Information Technology, 2009-10*, <https://www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/8129.02009-10?OpenDocument>
22. .auDA (2011) *Annual Report 2010-11*, [https://auda-corp-web-s3.s3.ap-southeast-2.amazonaws.com/prod/public/2020-11/2010-11-auDA-Annual-Report.pdf?V79OJFQRYI4Yom2rad\\_C5ISBDpV2IVkQ=](https://auda-corp-web-s3.s3.ap-southeast-2.amazonaws.com/prod/public/2020-11/2010-11-auDA-Annual-Report.pdf?V79OJFQRYI4Yom2rad_C5ISBDpV2IVkQ=)
23. Australian Securities Exchange (ASX) (2021) *S&P/ASX All Technology Index*, <https://www2.asx.com.au/markets/trade-our-cash-market/overview/indices/asx-all-technology-index>
24. Digital Transformation Expert Panel (2021) *The Learning Country – Digital Transformation Skills Strategy*, <https://acal.edu.au/digital-transformation-skills-strategy/>
25. Zhang D, Mishra S, Brynjolfsson E, Etchemendy J, Ganguli, D, Grosz B, Lyons T, Manyika J, Niebles J Sellitto M, Shoham Y, Clark J and Perrault R. (March 2021). *The AI Index 2021 Annual Report*, AI Index Steering Committee, Human-Centered AI Institute, Stanford University, Stanford, CA
26. Deloitte Access Economics (2020) *Economic Benefit Analysis of Drones in Australia, prepared for the Department of Infrastructure, transport, regional Development and Communications*, <https://www.infrastructure.gov.au/aviation/drones/files/economic-benefit-analysis-of-drones-to-australia-final-report.pdf>
27. Small Business Digital Taskforce (2018) *Report to Government*, <https://www.industry.gov.au/data-and-publications/small-business-digital-taskforce-report-to-government>
28. Alphabeta (2020) *Building Australia's Digital Resilience*, <https://alphabeta.com/our-research/australias-digital-resilience/>
29. Australian Chamber of Commerce and Industry (ACCI) (2020) *Covid-19 Business Conditions Survey Report*, <https://www.australianchamber.com.au/wp-content/uploads/2020/04/ACCI-COVID-19-BUSINESS-CONDITIONS-SURVEY-REPORT.pdf>

30. Alphabeta (2020) *Building Australia's Digital Resilience*, <https://alphabeta.com/our-research/australias-digital-resilience/>
31. National Australia Bank, (2020) *Supporting Economic Recovery: What we can do for Small Business*, <https://business.nab.com.au/wp-content/uploads/2020/07/Supporting-Economic-Recovery-What-we-can-do-for-Small-Business-2.pdf>
32. KPMG (2020) *Australian fintech landscape 2020*, <https://home.kpmg/au/en/home/insights/2017/08/australian-fintech-landscape.html>
33. KPMG and H2 Ventures (2019) *2019 Fintech100: Leading Global fintech innovators*, <https://home.kpmg/xx/en/home/insights/2019/11/2019-fintech100-leading-global-fintech-innovators-fs.html>
34. Interactive Games & Entertainment Association (IGEA) (2020) *Game Engine*, <https://igea.net/wp-content/uploads/2020/06/IGEA-Game-Engine-paper.pdf>
35. Microsoft (2019) *Accelerating competitive advantage with AI*, [https://info.microsoft.com/UK-DIGTRNS-CNTNT-FY20-10Oct-07-AcceleratingcompetitiveadvantagewithAI-AID-3001579-SRGCM3020\\_01Registration-ForminBody.html](https://info.microsoft.com/UK-DIGTRNS-CNTNT-FY20-10Oct-07-AcceleratingcompetitiveadvantagewithAI-AID-3001579-SRGCM3020_01Registration-ForminBody.html)



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