



Future State

How ICT & digital technology can improve our WA economy

7-11 Barry Drive
Turner ACT 2612
Australia

61 2 6281 9400
info@aiaa.com.au
www.aiaa.com.au

Contents

Statement from the Chair	4
How technology can improve the WA economy	6
1. Creating new skills and jobs for WA	9
1.1 Creating new jobs in the fastest growing industry	9
1.2 Attracting and retaining the world's best talent	10
1.3 Ongoing expansion and promotion of STEM/STEAM careers	10
1.4 Smart vocational pathways in addition to STEM/STEAM	11
1.5 Supporting our teachers and future ICT workforce	11
1.6 Industry and professional certifications	12
1.7 Promoting a diverse and inclusive workforce	12
2. Improving the WA public sector	13
2.1 Service Priority Review	13
2.2 Digital service delivery	13
2.3 Effective citizen centric government	14
2.4 ICT procurement reform	14
2.5 National and international collaboration	15
2.6 Cross sector collaboration	15
2.7 Culture, attitude and mindset	16
3. Transforming WA into a 21st century global economy	17
3.1 Communications, Broadband and Wireless	17
3.2 Cybersecurity	17
3.3 Smart industries	18
3.4 Smart cities and smart transportation	18
3.5 Smart infrastructure	19
3.6 Supporting start-ups, scale-ups and SMEs	19
3.7 Accelerating digital business capabilities	19
3.8 Digital State Development	20
3.9 Commercialisation, entrepreneurship and intrapreneurship	20
3.10 A future worth investing in	20
Recommendations	21
Thanks and Acknowledgements	25

The AIIA invites the new WA Government to work closely with industry on a **fresh approach** to technology in WA.

Together we can **accelerate the transformation** of WA to a 21st century global economy, **improve the public sector** and **deliver better services** to the WA community, and create **new skills and jobs** for WA.

About AIIA

The Australian Information Industry Association (AIIA) is the peak representative body and advocacy group for those in the digital ecosystem. Since 1978 the AIIA has pursued activities to stimulate and grow the digital ecosystem, to create a favourable business environment for our members and to contribute to Australia's economic prosperity.

We do this by delivering outstanding member value by providing a strong voice of influence; a sense of community through events and education; enabling a network for collaboration and inspiration; and through the development of compelling content and relevant and interesting information.

AIIA represents organisations from early stage technology startups, to Australian-born businesses of small, medium and global scale, and international organisations including Apple, Adobe, Avanade, EMC, Deloitte, Gartner, Google, HP, IBM, Infosys, Intel, Lenovo, Microsoft and Oracle; international companies including Optus and Telstra; national companies including Ajilon, Data#3, SMS Management and Technology and Technology One; and a large number of ICT SMEs.

Our national board and State Councils represent the diversity of the digital economy. More information is available on our website at www.aiia.com.au.

Statement from the Chair

I am proud to present the WA ICT industry position paper on behalf of the Western Australian Council of the Australian Information Industry Association (AIIA).

At AIIA we are focused on growing Australia's social and economic prosperity through technology and innovation. Our vision directly links to a larger national purpose. We exist to create and sustain a positive technology environment that drives economic growth, skills, development and job creation.

This report directly supports the new State Government's Plan for jobs to create an economy that is strong, diversified, innovative, efficient and resilient. ICT also has a key role to play in implementing the WA recommendations of the Government Service Priority Review and Machinery of Government changes to deliver a modern, efficient and responsive public sector.

The AIIA understands the environment of the State Government and the opportunity of leveraging ICT and digital to drive efficiencies, deliver cost savings and underpin regional growth.

West Australians know we need to broaden our economy and become more diverse and dynamic, and to better engage with Asia on both tradeable goods and services, and in the knowledge economy.

The initiatives proposed in this report reflect a shift for WA toward collaboration with the best and brightest from around the world in order to rapidly affect this transition.

Our deepest thanks go to the many organisations, people and collaborators across the country and around the world listed in the acknowledgements who have given so generously of their time and expertise in preparing this report.

The support, interest and level of engagement in preparing this report for Western Australia has been incredible, from organisations as diverse as LEGO Future Lab in Denmark; Bankwest, BHP Billiton and Woodside; global Universities and research bodies; industry, media and advocacy groups; and other State and Federal Government organisations in Australia and abroad.

ICT is unique in that it is relevant to all sectors of the economy, it enables business at all levels, is key to education and touches all factors of production. However, it is a double-edged sword. On the one hand, it can deliver significant impact – acting as a force multiplier to amplify and accelerate outcomes. On the other hand, if it is left unmanaged, it can bring the sort of large scale disruption that has been seen and felt in many sectors and regions in recent years.

Western Australia is no exception, and this paper proposes for our State to play an important leadership role, leveraging ICT to diversify our economy, create new higher paying and more rewarding jobs, and enhance our services and society.

Now more than ever we must move fast to set our course or risk being left behind. Our future prosperity hinges on our ability to innovate, which in turn will drive jobs, growth and our global competitiveness.

Looking forward, ICT and digital transformation will affect all sectors regardless, and at an accelerating rate. With the right approach, this provides the opportunity for large scale transformation across the entire State economy, creating a new economic future for WA building on our natural strengths.

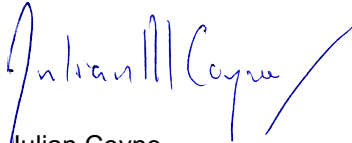
This process does not need to be confusing or intimidating. There are many precedents of successfully achieving this transition from around the world, often starting from a much lower base than WA.

We have an unprecedented opportunity to successfully implement the major structural reforms currently being discussed in WA, to unlock major value in our economy, and to cement a long term sustainable competitive advantage for future generations.

Future State: How ICT & digital technology can improve our WA economy

The AIIA commends the new Government on its commitment to delivering real outcomes for the community of Western Australia. The appointment of an ICT Minister, the major public sector reforms, together with the focus on industry development and new job creation are all excellent steps toward creating a new future for WA.

We look forward to working closely with the new State Government in delivering an improved public sector, a more vibrant and diversified economy and a broader range of industries and jobs for Western Australia.



Julian Coyne B.Comp.Math (Hons, UWA), MACS (Snr) CP, M.IEEE, AusIndustry/MGSM/AIIA ICT Industry Entrepreneur

WA Council Chair

Australian Information Industry Association

How technology can improve the WA economy

Engineering Economic Transformation...

Former Prime Minister Lee Kwan Yew led the transformation of Singapore from a mudflat into a city state. Singapore has often been referred to as an 'economic miracle' for achieving so much in such a short space of time.

However, this economic miracle was intentional. It was engineered from the beginning, and it stands as a testament of what can be achieved with the right blend of vision, policy, skills, investment, infrastructure and technology.

Another example of an engineered transformation is Israel, which has reimagined its way from a patch of desert to become the 'Startup Nation' that today attracts 25% of global venture capital, has the highest number of scientists per capita anywhere in the world, and is a global leader in technology, science, medicine, and cybersecurity.

Perth's sister city and World Energy Cities partner Houston faced a remarkably similar economic situation to WA during the Oil Price shocks of the 1980s, and has also successfully diversified into medical research and technology. Other examples abound such as Finland, post-war Japan, Silicon Valley, Estonia and New Zealand.

All demonstrate what is possible in a variety of economic and geographical contexts by setting a strategic direction, harnessing the best that exists and building on natural strengths.

Given WA's many unique strategic advantages, together with the fact we are starting from a much higher base than most regions enjoy globally, there is no reason we cannot achieve the same or better outcomes than other standout examples before us.

We are presented with a significant opportunity to transform WA and Australia and to become an economic and technology leader in our region – as we already are for Mining and Resources software globally.

However, it will not happen automatically. It will take public and political will. Especially in our current economic climate, it will require smart, disciplined and targeted reprioritisation of both effort and expenditure to achieve pragmatic and cost effective investment into this new future for WA.

Closer to home...

Closer to home, an excellent and instructive example can be found that mirrors the challenges and opportunities facing WA.

In 2008, with its financial system and government hit with the full force of the Global Finance Crisis (GFC), the New South Wales Government was forced to 'take its medicine' - making many difficult decisions and enacting painful structural reforms.

ICT and digital transformation were at the heart of NSW Government strategy and have remained so, which has paid generous dividends. Since making these reforms, NSW has gone from being one of the worst performing States to now being a clear leader in public sector ICT delivery nationally.

In the process the NSW Government has also unlocked significant outcomes in skills, economic and industry development. These outcomes have been achieved through the thoughtful design and pragmatic implementation of deliberate, specific and targeted measures.

During the 'lazy decade' of the mining boom, WA was largely insulated from the effects of the GFC and did not make similar reforms or investments in to ICT. An unfortunate side effect of this has been that over the same period WA consistently ranked last for public sector ICT transformation and delivery.

A Significant Opportunity for Western Australia...

We are therefore faced with both a challenge and an opportunity in WA.

Our challenge is that we have been the poorest performing State for public sector ICT outcomes for most of this period. This is acknowledged in both the WA Government's DigitalWA Strategy 2016 and the WA Parliament's Public Accounts Committee's 2016 Report "Doing ICT Better – Improving Outcomes from the Western Australian Government's Investment in Information and Communications Technology (ICT)".

Our opportunity is that with the right approach, the new Government can fundamentally transform the shape and character of the WA public service and the broader economy for current and future generations. We have a significant opportunity to leapfrog other jurisdictions and deliver better services to communities across the State.

The AIIA has enjoyed collaborative working relationships across the WA public sector including the Office of the Government CIO, Department of Commerce, the Department of Finance and many Western Australian Government agencies.

The AIIA has supported and contributed to key initiatives and milestones such as the development of the WA Innovation & DigitalWA Strategies, as well as major procurement reforms, policies and input to several parliamentary inquiries.

WA has incredibly strong foundations on which to build this new future, with our world class infrastructure, education and healthcare. We also enjoy many strategic advantages such as our time zone, our proximity to Asia, natural resources, industry specialisations, and our world class engineering, research, business and technology capabilities.

However, success cannot be taken for granted and there is much work to be done.

The experience of NSW Government provides a timely and insightful reminder of what can be achieved in similar economic conditions given the right priorities and policies. The transformation of NSW began in tough economic times, with the decision and resolve to change the way things were done through committed focus and strong leadership.

As the largest procurer of ICT in Western Australia, the State Government is uniquely positioned to spearhead reforms that will improve performance and outcomes across both government and industry.

The opportunity exists for WA Government to adopt a fresh approach to ICT and digital, and to deliver significant outcomes in the following key areas:

1. **Improve public sector ICT delivery** with better financial outcomes and cost savings
2. **Support growth and productivity** in the wider community and economy
3. **Improve services** with better citizen centric services and outcomes
4. **Support policy decisions** through improved data sharing, analytics and insights

Ready, willing and able...

With our national footprint, global networks, industry capabilities and experience, the AIIA stands ready to work with new Government to transform Western Australia into a vibrant, diversified 21st Century global economy.

A once in a generation opportunity exists for WA to achieve major public sector reform, vastly improve government services and to successfully diversify the WA economy.

These outcomes all stand to deliver the best outcomes for Western Australia, enabling the new Government to achieve its strategic objectives.

Done correctly, it will enable the large scale transformation of the WA public sector, supporting the long overdue consolidation and reform of the Machinery of Government underpinned by common digital platforms that drive the best citizen centric services.

This transformation can be used as a catalyst for driving innovation and global collaboration - unlocking significant gains in economic growth, jobs and skills development for current and future generations as we enter an increasingly digital world.

The initiatives outlined within this report support these objectives targeting three key areas:

- 1. Creating new skills and jobs for WA**
- 2. Improving the WA public service**
- 3. Transforming WA to a 21st Century global economy**

1. Creating new skills and jobs for WA

To be a truly 21st Century digital economy we need to develop a skilled workforce that can both create and consume technologies that maximise human and economic potential for our society.

1.1 Creating new jobs in the fastest growing industry

The ICT sector had the fastest rates of workforce growth in Australia in 2016, and is set to be a rare driver of significant economic growth in an era of subdued global forecasts. There were 628,810 ICT workers recorded in Australia in 2015 which is set to increase to 695,000 by 2020.

Australia and the South East Asian region are well behind in supply of quality ICT and technical skills. In Australia demand is outstripping supply, there was a net migration inflow of 20,700 ICT workers from overseas in 2016-17, which provides a significant opportunity to develop local skills and jobs.

Our world class education system and high proportion of qualified professionals provides an opportunity for WA to become a regional leader in this space with the right policies and leadership. To achieve this, WA must develop strategies to reduce 'brain drain' in WA, invest in up-skilling existing businesses and individuals, step up investment in digital skills, and ultimately develop new export industries and exportable capabilities.

Software and digital services make for ideal exports as they do not require the physical transfer of goods and can be done remotely. WA is already recognised as the 'Silicon Valley' for Mining and Resources software, having developed 70-80% of global solutions.

We have major opportunities with the Square Kilometre Array and together with our expertise and capabilities in energy, resources and remote operations. The communication and data capabilities required in these projects applies to the Internet of Things (IoT) and translates across industries.

However without focus and attention we will rapidly lose this position to other regions who are better organised, who have recognised this massive opportunity, and are actively investing in large scale collaborations between industry, government, research and education.

Worldwide spending on digital transformation (DX) technologies will reach US\$1.2 trillion in 2017, with increased investment creating new opportunities.

Representing a healthy 17.8 per cent boost from 2016, IDC reports that total market value will top US\$2 trillion by 2020.

IDC WORLDWIDE DIGITAL TRANSFORMATION SPENDING GUIDE 2017

1.2 Attracting and retaining the world's best talent

ICT and digital skill sets are unique in their portability. Unlike many other professions and industries, careers in ICT, or that include ICT or that allow transition to ICT are untethered to a particular location - it is quite literally a global battle to attract and retain the best talent.

This works both ways and, managed correctly, provides Western Australia with a clear opportunity. Our State has so much to offer with our proximity to Asia, geopolitical stability, direct flights to major economic zones, comparatively affordable housing (very relevant to younger workers), incredible lifestyle and weather, the world's best beaches and outdoors, modern infrastructure and access to major industry and business – making it especially attractive to global knowledge workers who can bring incredible capability and opportunity.

Western Australia also has major strategic opportunities in the following key scientific fields:

- Radioastronomy
- Agriculture
- Minerals
- Oil, Gas & Energy
- Health & Biotechnology
- Land & Marine Biodiversity

Each of these scientific fields is underpinned increasingly by ICT & digital capabilities such as data science, Artificial Intelligence, machine learning and Internet of Things (IoT). Establishing WA as a world class destination for these capabilities can be used as a magnet to attract global talent and reduce 'brain drain' in these scientific fields, and deliver cross industry benefits via knowledge & technology transfer.

Australia's digital economy is forecast to grow from 5% to 7.3% of GDP by 2020

DELOITTE 2017 DIGITAL PULSE REPORT

1.3 Ongoing expansion and promotion of STEM/STEAM careers

Industry, government and academia need to better coordinate on initiatives to promote Science, Technology Engineering and Mathematics (STEM) skills across the educational and career lifecycle, and across more of society.

STEAM careers include the Arts which are key to ICT and digital areas such as media, marketing, advertising, gaming, Virtual/Augmented Reality, youth engagement and social media. Government can work with schools and universities to reform educational offerings and standards, and set up a taskforce to ensure our teaching is, and remains, world class.

On skills development, often the test of the system is the graduates. At present, we are failing to prepare graduates for a lifelong journey of learning and a career path that may take several paths over time. In addition to technical knowledge, we need to ensure our graduates are prepared for ongoing learning and career evolution, as in other evolving professions such as medicine and engineering.

In ICT and digital technology the pace may be faster, but the requirement for lifelong learning is the same. Otherwise we risk falling into complacency.

We believe STEM in schools is essential to our future. This is why we're working together with schools and universities to shape the right skillsets for our future.

SHAUN GREGORY
WOODSIDE ENERGY CIO
2017 IT NEWS AUSTRALIAN CIO OF THE YEAR

1.4 Smart vocational pathways in addition to STEM/STEAM

The development of vocational and qualified people is a cornerstone of Australia's ability to become a 21st Century global economy. Many new ideas, opportunities and business ventures can and do unfold from the Vocational and Educational Training (VET) training environment.

In Silicon Valley, an increasing trend is for companies to recruit and foster talent directly from high school based on attitude and technology skills. To truly diversify the economy, we could consider on equal terms both VET and University elements of the post K-12 education framework.

This might include establishing dedicated post VET enterprise hubs, to help VET graduates consider creating their own new ventures as an alternative to conventional employment pathways within corporate or government.

Many of the qualifications for programmers and software developers are not highly prioritised on the State priority occupation list.

**45% of the jobs that we know of today will disappear in the next 15 years.
75% of jobs replacing these will require STEM skills.**

DELOITTE 2016 DIGITAL PULSE REPORT

1.5 Supporting our teachers and future ICT workforce

Across the community there is increasing demand for the upskilling of our children in coding and programming, the new skills that underpin problem solving and effective decision making.

The technology children are often exposed to at school, fails to translate the technology they will be exposed to at work, showing a clear industry and educational misalignment. Industry can work with government and education system stakeholders to address this.

The ICT industry is already encouraging and working with organisations like Coderdojo¹ and other community based initiatives to ensure the WA community is not left behind. ICT will play a pivotal role in working with our education sector and stakeholders such as schools and Scitech to link the ICT industry with our teachers and their students.

Teachers are struggling with ever-changing Digital Curriculum. The ICT industry can play an important role in connecting ICT of the classroom to the real world.

**STEM skills will only become more important across the economy by 2030,
and they apply throughout the life course.**

DR CHARLIE DAY
CEO, OFFICE OF INNOVATION AND SCIENCE AUSTRALIA

¹ <https://coderdojo.com/about/>

1.6 Industry and professional certifications

Better recognition and reward for industry and professional certifications will improve the standard and professionalism of ICT service delivery and capability in WA - important in a high growth and dynamic industry. This lifts the standard of performance by ensuring peer review, assessments and ongoing training as in other professions such as engineering, medicine and law.

Government and industry can work on initiatives such as recognised certifications, procurement preferences, governance, salary and contract rewards and promotion of certifications such as Engineers Australia's Information, Telecommunications, and Electronics Engineering (ITEE) College, and the Australian Computer Society's Skills Framework for the Information Age (SFIA), developed by a consortium of 30 organisations over 22 years and spearheaded by the British Computer Society (BCS).

Australia's ICT sector had the fastest workforce growth of 2% from 1.4% p.a. in 2016

DELOITTE 2016 DIGITAL PULSE REPORT

1.7 Promoting a diverse and inclusive workforce

ICT and digital skills provide an excellent pathway for industry and government to drive equality in remuneration, recognition and opportunity across society.

ICT and digital also lends itself to flexible and remote working and learning arrangements which facilitate upskilling, lifelong learning, diversity and inclusion - increasing participation and engagement across all of society.

We need to create a new approach built around the behaviours and aspirations of the emerging generation, and shake up the traditional paradigms that have persisted for the past decade so that they are fully engaged. Compared to the baby boomers and Generation X, this is a generation of digital natives and global citizens. We can work to review and question the traditional paradigms and practices and think how the leaders of tomorrow will approach things.

Many ICT and digital roles are exceptionally well suited to those with unique gifts and capabilities such as those on the Autism Spectrum, and encourage additional modes of employment. The work of the Autism Academy of Software Quality Assurance (AASQA) in Western Australia showcases the excellent results that can be achieved with the right thought leadership and industry collaboration.

The Autism Academy for Software Quality Assurance (AASQA) aims to improve the participation rate by helping high school students on the autism spectrum identify and develop interests in STEM using coding and robotics

HER EXCELLENCY THE HONOURABLE KERRY SANDERSON AC
GOVERNOR OF WESTERN AUSTRALIA
PATRON OF THE AUTISM ACADEMY FOR SOFTWARE QUALITY ASSURANCE

2. Improving the WA public sector

WA needs to be a 21st Century economy that is data driven, efficient and competitive on the global stage. This requires the right mix of culture, collaboration and leadership. ICT and digital transformation can deliver the catalyst to unlock significant results in these areas.

2.1 Service Priority Review

The AIIA applauds the new Government for undertaking the Service Priority Review (SPR) to drive major reform of the public sector to bring WA into line with the other major States in Australia.

This provides an unprecedented opportunity to deliver a more innovative, collaborative and efficient public sector. ICT and digital technology has a key role to play in both the SPR and addressing its recommendations, which will be key to delivering an efficient, innovative and cost effective public service that delivers real outcomes for Western Australia.

Digital technology and data analytics can also be used to implement, measure and monitor whole-of-government KPIs, to ensure a public service that is outcomes driven and consistently held to account. This will improve service delivery, accountability and efficiency across Government.

ICT and digital technology are key enablers to implementing the recommendations of the review, delivering a more user-friendly government at lower cost and increased convenience for WA taxpayers.

Western Australians deserve and expect an efficient, innovative and effective public service that delivers real outcomes for the community

THE HON MARK MCGOWAN
PREMIER OF WESTERN AUSTRALIA

2.2 Digital service delivery

Digital services can be used to deliver more convenient services to the community around the clock, eliminate unnecessary red tape, remove paper based and manual processes and improve coordination across Government.

Slow and inefficient government processes harm WA's international and national competitiveness for no gain. It is all pain. Other jurisdictions have solved these problems with streamlined and integrated digital solutions. We can learn from, and collaborate with, our partners to rapidly progress and adopt proven solutions rather than reinvent the wheel.

**If you love paper, do origami.
But if you want to work in the 21st Century then it's really got to be digital.**

THE HON VICTOR DOMINELLO MP
NSW MINISTER FOR FINANCE, SERVICES AND PROPERTY
DIGITAL GOVERNMENT THOUGHT LEADER

2.3 Effective citizen centric government

Citizens compare digital government services to those of the technology, banking and private sectors. These provide fast, convenient and quality services that set the benchmark for consumer expectations.

Government is also a major service provider and must keep pace. Citizens expect the same level of increasingly personalised service, irrespective of whether they are engaging the public or private sector. With the pervasiveness of digital technology across all aspects of their lives, citizens are increasingly intolerant of inefficient, inconvenient or poor quality services from Government.

This has been repeatedly demonstrated in recent storms of social and traditional media around Australia from the technology failures of Centrelink, the ATO and the ABS. This also highlights the importance of Government working with industry to improve program design, governance and execution.

With WA starting at the lowest national position in public sector ICT delivery, we have the opportunity to leapfrog and deliver the world's best digital services and lower cost to the taxpayer.

94% of digital opinion leaders are concerned that senior managers in Australia lack the understanding of what makes a great digital experience

EY AUSTRALIA: STATE OF THE NATION 2015-16

2.4 ICT procurement reform

The AIIA has worked closely with the State and Federal Governments on ICT procurement reform and AIIA's best practice guide, and this continues to be an area of sustained focus across all Governments.

ICT procurement contrasts with other sectors in the pace of change, market dynamics and ever expanding range of technology choices. Government must continue to work closely with industry to stay up-to-date with best practices and deliver a stable and consistent environment that maximises outcomes for Government whilst ensuring a clear, fair and stable environment for industry.

Simple reforms such as requiring annual publishing of major ICT and digital initiatives on a rolling 3-year basis within departmental strategies will ensure better project definition, less reactivity and improved ability for the market to plan and respond with appropriate solutions and resourcing.

Pre-market consultation with industry as part of major ICT project initiation is another simple reform that can drive major improvements. ICT procurement reform offers unique potential for industry and economic development through startup, SME and local industry engagement.

Other reforms could include fast tracking data-driven decisions and business cases, mandating and publishing benefits realisation and post implementation reviews, linking funding to demonstrable outcomes, providing incentives for exceptional project delivery and promoting cross agency collaboration through funding incentives, open data, standards and APIs.

Measures such as a digital transformation taskforce are good ideas. They have the best chance to succeed if they are suitably empowered by being located close to the heart of the government structure.

Visible and central leadership on digital and IT delivery is increasingly apparent as a key factor in the success of government initiatives in these areas.

AUSTRALIAN GOVERNMENT ICT PROCUREMENT TASKFORCE
DEPARTMENT OF THE PRIME MINISTER AND CABINET

2.5 National and international collaboration

WA Government should explore national and international collaboration with regional Government exemplars such as New South Wales and New Zealand. This will allow WA to benefit from lessons learned, rapidly integrate proven solutions and facilitate development and extension of capabilities between partners with lower duplication.

Inbound and outbound collaboration opportunities should be considered on an ongoing basis to position WA as both a regional leader and an outward looking jurisdiction. For example, Australia's first OpenGov forum was piloted by AIIA WA in Perth last year and delivered a high quality and cost effective inbound collaboration platform for public sector delegates across South East Asia and Australia, which has since been replicated in Victoria, NSW and Canberra.

Outbound collaboration opportunities exist through organisations such as the Australia Israel Chamber of Commerce (AICC), the American Chamber of Commerce and Industry (AmCham) and the Federal Government's AusTrade network who facilitate regular trade delegations and missions to provide linkages between industry, research and government.

Digital channels provide further collaboration opportunities. For example the 2015 Institute of Public Administration Australia (IPAA) National Conference held in Sydney was live streamed over the web and explored impacts and opportunities for federation reform using the digital economy.

2.6 Cross sector collaboration

As well as Government collaboration, WA Government can foster deeper collaboration with and between industry and academia at both state and national levels. This will bring additional perspectives from outside Government and develop new capabilities to work smarter and achieve better results.

Collaboration with other countries, governments, commercial organisations and communities of interest will allow WA Government to drive cultural change and to rapidly learn and adapt to new challenges and opportunities.

Deeper collaboration and understanding can be fostered through secondments between Government, start-ups, research and commercial enterprises. This would facilitate knowledge sharing and best practices across sectors, and provide real world environments that allow participants to develop and update skills in areas such as entrepreneurship, design, R&D, risk, negotiation, value creation and benefits realisation.

**With all the rapid advances in technology, disruption is inevitable.
It is beginning to happen across every industry from entertainment to insurance.**

To thrive, or even survive, in this environment you must be proactive and invest in innovation. Coding is simply a form of literacy. As our society's dependence on digital technology grows stronger, so does our necessity to understand this new language.

**Our LEGO team in Los Angeles works directly with headquarters in Billund, Denmark.
Over the last few years there have been many advancements
in tools and means of remote collaboration.**

DAN WINGER
LEGO FUTURE LAB

2.7 Culture, attitude and mindset

Culture, attitude and mindset are key to affect any lasting change.

All sectors in WA need to work on dramatically improving our performance in these areas. In the main, Australians are poor at celebrating and promoting our significant success and capabilities, we do not relate to failure constructively and we are highly risk averse.

This is holding us back, and is reflected in various statistics such as Australia having the lowest commercialisation rates for biomedical technology in the OECD, despite some of the best research capability in this same area globally.

Many examples in other jurisdictions locally and globally have shown what is possible with the right skills, technology and attitude. WA punches well above its weight in many key areas, and by engendering the right mindset there is no reason we can't extend this to ICT and the digital economy.

We can be world class in ICT and digital technology by learning to take calculated risks, validating assumptions, measuring results, confronting failure early, learning from our mistakes, accepting accountability, avoiding blame, working collaboratively and challenging entrenched beliefs and practices.

We need to better identify and reward our local thought leaders and action leaders, and celebrate our incredible talent. We need to make room for new ideas and encourage entrepreneurial thinking in everything we do. The example needs to be set at all levels from Government, industry, universities, schools to households.

The best way to futureproof Western Australia is through talent optimisation and ethical entrepreneurship.

JOHN CLUER, CEO
AUSTRALIA ISRAEL CHAMBER OF COMMERCE WA

3. Transforming WA into a 21st century global economy

ICT is both an industry in itself, and an enabler across all other industries. This is a key factor in how ICT can be used to transform WA to a 21st century global economy.

Western Australia has the potential to become a regional hub of technology, as the gateway between Asia and the rest of Australia, driving economic growth and creating new jobs and industries.

However, it will not happen automatically. It will take public and political will, and the smart and targeted reprioritisation of effort and expenditure, to achieve pragmatic and cost effective investment at this crucial time in shaping the future for WA.

3.1 Communications, Broadband and Wireless

As we transition to a digital economy, high-capacity broadband access becomes essential for households and businesses. A lack of access, or high cost of access to reliable communication services create a barrier to individuals, businesses and service providers fully engaging with the digital economy.

This is of particular concern to WA with major opportunities in areas such as smart mining and agriculture. With our large geographical scale, it is imperative that our cities and regions in particular have reliable communications, broadband and wireless connectivity to support agile clusters and local and regional industry development initiatives such as agriculture and mining.

In 2016 Perth internet speeds ranked as the worst of any capital city in the country averaging 7.1 megabits per second². That is already off a low base, given Australia ranked 48 out of 180 countries for broadband speeds, which is projected to get worse over time.

Given Western Australia's unique geography and communications requirements, the Government should consider and encourage innovative and radical proposals to resolve the major telecommunications challenges facing the State, and impacts on industry and on future growth.

High quality free wireless connectivity is also lacking in WA cities and regional centres. This is relatively straightforward to implement and can also benefit business and tourism. These services are increasingly expected by global travellers, and reflect poorly on WA's technology adoption and capabilities.

3.2 Cybersecurity

Western Australia has unique strategic opportunities in Cybersecurity. Firstly through our initiatives such as the ECU Security Research Centre and Curtin University's Internet of Everything Innovation Centre. These provide national thought leadership, and serve as excellent platforms for collaboration between industry, government and research. The announcement of ECU being selected by the Australian Government as one of only two Academic Centres of Cybersecurity Excellence provides national recognition of this.

Secondly our remote operations expertise, together with the advanced plant and assets of the mining and resources industry position WA the potential global leader in the field of industrial cybersecurity.

With heightened awareness of Cybersecurity risks and threats, this is an area that Western Australia can provide unique perspective and capability to the national and global landscape – delivering new skills, jobs and economic benefits across the State.

² <http://www.abc.net.au/news/2016-08-31/perth-internet-speeds-among-worst-in-nation-report-says/7801902>

3.3 Smart industries

By harnessing our highly skilled engineering, business and technology talent, our industry specialisations, our world class research and entrepreneurial drive, WA has unique potential to tap into massive emerging industries in defence, agricultural technology, advanced manufacturing, biomedical and industrial automation.

For example, our world leading knowledge, skills and technical capability in areas including autonomous haulage, remote operations, industrial automation and processing can be expanded and translated to new industries and exported.

However this must be underpinned by proper investment in ICT and digital skills development such as coding, data analytics, artificial intelligence, machine learning, drones, robotics and cybersecurity. As new jobs and industries are created this will ensure we build relevant capabilities to support industry during the transition, allow talent to be sourced locally, and retrain and reskill the existing workforce.

This will ensure WA and Australia make the most of the unprecedented economic and industry development opportunities represented by technology.

Today on forbes.com I read the headline: Cyber crime to cost \$2 Trillion by 2020. Add to that the geospatial industry worth \$270B and the drone industry worth \$127B.

It makes me ask why people aren't rushing to STEM careers or retraining staff. This isn't just for students, in Australia we are already lacking the skills we need.

How much worse is it going to get before we start to invest/change the way we see these career pathways? How do we achieve this quickly and effectively?

DR CATHERINE BALL
COUNCIL MEMBER, QUEENSLAND FUTURES INSTITUTE

3.4 Smart cities and smart transportation

Industry and Government can work on a WA Smart Cities Strategy, leveraging smart technologies and planning to create modern, vibrant, liveable, connected, green and collaborative cities that will underpin future prosperity in WA.

Smart Cities are beginning to get significant attention and commitment in Australia - with the release of the Federal Smart Cities Plan and appointment of a national Minister for Smart Cities and Digital Transformation in 2016.

The Adelaide and ACT City Councils recently signed a joint Smart Cities collaboration agreement, demonstrating the potential of cross jurisdictional collaboration to drive mutual learnings and benefits. WA is well positioned to collaborate with the best in Australia - we are set apart with our proximity to Asia, incredible lifestyle and weather, modern infrastructure, business and industries.

We can also leverage our world class Universities through Smart Campus initiatives, being an ideal test bed for technologies and connectivity that can be transposed into the Smart City.

The global lesson is that smart cities collaborate to compete. There is great incentive here for everyone to work together.

THE HON ANGUS TAYLOR MP
MINISTER FOR SMART CITIES AND DIGITAL TRANSFORMATION

3.5 Smart infrastructure

Future capital works should have a minimum of 2% set aside to apply smart instrumentation (Internet of Things) and data analytics. This will provide improved measurement and monitoring, reduced maintenance, maximise the life cycle of the infrastructure and ensure value for public monies invested.

We also have a significant opportunity to commercialise and translate our world leading research outcomes from major infrastructure such as the Square Kilometre Array in areas such as remote operations, sensing, Internet of Things (IoT) and data analytics. These have global, cross industry applicability and further advance our existing advanced industry capabilities in these areas.

3.6 Supporting start-ups, scale-ups and SMEs

With low capital requirements and the ability to scale rapidly, start-ups, scale-ups and SMEs provide a unique path to growth and rapid diversification of the WA economy and jobs growth.

The competition to attract start-ups and scale-ups is intensifying as they are seen increasingly as a driver of jobs and growth. The WA Government can play an active role in attracting and growing this sector, and realising a commercial return for the State, by establishing a Venture Capital Fund for start-ups and scale-ups, as has been recently done in South Australia, New South Wales and Victoria.

Western Australia already has a strong reputation for the development of mining & resources software, however more must be done to replicate this success more broadly, to attract, retrain and retain talent, and cultivate an ecosystem that ensures start-ups, scale-ups and SMEs remain and reinvest in WA.

We risk losing our competitive advantage in this area if we do not upskill in delivering digital technologies such as artificial intelligence (AI), machine learning, cybersecurity, data analytics, robotics, 3D printing, automation, Internet of Things (IoT), remote operations and analytics. These capabilities apply to new growth areas of strategic relevance to the WA economy such as agricultural technology, mining & resources, defence, cybersecurity and natural resource management.

As the largest ICT customer in WA, Government can support this sector through innovative procurement practices such as proof-of-concept engagement, reverse pitching and technology pilots.

Increased penetration of digital technologies can lift Australia's productivity and growth to deliver some \$35 billion additional economic output over by 2020

ACCENTURE INSIGHT DIGITAL DENSITY INDEX

3.7 Accelerating digital business capabilities

SMEs are regarded as the backbone of the economy in many countries including Australia. In WA SMEs with less than 20 staff represent 97% of business. However the rate of adoption of digital technology in SMEs remains low, and relatively small investments in digital capabilities can yield big results.

50% of future employment growth will be in the SME sector, with the highest growth in companies that are less than 5 years old and have less than 10 staff. Government has a role to play in supporting initiatives to enable WA businesses to easily assess the progress of their digital maturity, and to identify and address gaps and opportunities for improvement.

Digital can represent the next frontier of productivity and economic uplift for Australia, with the potential to contribute between AU \$140 billion and AU \$250 billion to Australia's GDP by 2025, based on currently-available technology alone.

DIGITAL AUSTRALIA 2017 REPORT
MCKINSEY & COMPANY

3.8 Digital State Development

Western Australia's economy has traditionally been centred on primary industry where we have historical competitive advantage. Accordingly, State Development functions of WA Government have largely been focused on this sector for growing the State economy.

Our world is changing rapidly. The digital economy is already disrupting many industries, and the rate of disruption is accelerating. For WA to effectively compete and succeed in the digital economy as it evolves, State Development functions within Government need to focus increasingly on transformative and innovative digital services and industries, which will grow as the digital economy grows.

3.9 Commercialisation, entrepreneurship and intrapreneurship

Development of entrepreneurial and commercialisation skills are key to the success of countries like Israel. This goes beyond just innovation. Countries like Chile are pushing the limits of incorporating these key skills into the essence of their economic policy. Success is assured through understanding that economic growth is fundamentally based on having a vision for the future.

WA has historically enjoyed wide recognition for our entrepreneurial and independent streak, which can be harnessed with programs and policies to grow our entrepreneurship, intrapreneurship and commercialisation skills, and support our transition to a 21st Century global economy.

Entrepreneurs are unreasonable: they never accept the status quo, see opportunities in almost everything, learn from failure, and change systems from within.

But they also need partners to achieve success – team members, corporates and governments – and it is important to build bridges to enable these partnerships to flourish.

DR PAMELA HARTIGAN
FOUNDER OF THE SKOLL CENTRE FOR SOCIAL ENTREPRENEURSHIP
OXFORD UNIVERSITY SAID BUSINESS SCHOOL

3.10 A future worth investing in

The only way to realise a more efficient and productive future is to invest in it. This is very well understood when thinking of roads, schools, hospitals and utilities, but often not as well understood when it comes to ICT and digital assets.

We need to think differently about ICT and digital as the means to invest meaningfully in our future, rather than simply a cost item. When it comes to ICT and digital, we should be most worried about indiscriminate cost cutting which may be reducing our global competitiveness as a State.

If we are vigilant we can reduce waste and achieve targeted and effective cost cutting, and better efficiencies across the board. However, if we are short sighted and see an easy way to show a saving by cutting back on ICT, we risk the very future that promises to be one of the most rapid and scalable ways to diversify the WA economy and help improve our efficiency, growth and competitiveness.

The best way to predict the future is to invent it.

ALAN KAY
XEROX PALO ALTO RESEARCH CENTRE

Recommendations

There are many places to start and options to consider when faced with such a significant opportunity to transform the WA economy. The most important thing is to acknowledge the need, and commit to an effective course of action with strong and visible leadership.

AIIA would welcome the opportunity to work together and explore when, where and how to start. We, and those who have contributed to this paper, are in no doubt that this is the next major opportunity for Western Australia, and must be maximised to ensure that our State is not left behind.

Top 3 Recommendations

1. Digital Council

AIIA recommends the Government establish a Digital Council, with the specific aims of driving better Digital Government, Analytics & Cybersecurity for WA. The Council will drive major improvements in the key areas of digital service delivery, policy, efficiency, accountability, cost savings and security.

In order to be successful this needs to be established near the heart of Government and must have visible senior buy-in. Ideally this would be chaired by the Minister for ICT and would have broad stakeholder representation across industry, business and government. In addition, it should have strong authority to drive change across Government.

2. WA Priorities Programme

WA Government should articulate no more than 10 clearly understood, and readily measurable, targets that resonate with people across key public policy areas. This would model the success of New Zealand Government's **Results Programme** and the NSW Government's **Premiers Priorities**.

These initiatives have demonstrated the strong value in putting forward clearly defined results that focus on a clear and measurable outcome. Each should be explained in plain language so the average person can understand why it is being done, and what the value will be. Examples could include "reduce hospital wait times by ..." or "ensure every child starting school has access to ...".

Delivery on these targets should rest with no more than two agencies in terms of accountability processes. This reflects learnings from New Zealand that fewer agencies involved delivers better outcomes, and aligns well to the Machinery of Government consolidation in WA.

3. Targeted "Easy Wins"

New Industries Fund (NIF): To reflect the unique position of ICT and digital as enablers across industry, we recommend the NIF have either an overall percentage allocated to ICT and digital projects, or alternatively that each NIF project include a percentage of ICT and digital investment to specifically deliver digital economy development outcomes.

Primary Industry Transformation: We recommend the State Government strongly engage with primary industry, the Federal Government and the research sector to position WA as a world leader in the use of advanced technologies to drive large scale industry transformation, building on our high concentration of global leaders and our existing capabilities in automation and remote operations.

Accelerating Digital Uptake: McKinsey & Co have estimated that digital, based on currently available technology alone, can potentially add another \$140-\$250 billion to Australia's GDP by 2025. However this requires better education and adoption of digital technology. Government has a role to play in this, for example through an industry facilitation and support programme (ISFP) to support understanding and uptake of ICT and digital across the economy.

Procurement Reform: We recommend the WA Government prioritise innovative procurement reforms that deliver better services, create new jobs and skills, and support industry development outcomes.

Current Initiatives

STEM Advisory Panel: The AIIA commends the WA Government for establishing the STEM Advisory Panel chaired by the WA Chief Scientist and looks forward to contributing to this important initiative.

Industry Participation Strategy: The AIIA stands ready to collaborate with Government to reshape procurement benefits for WA through the Industry Participation Strategy in the new Jobs Bill.

Service Priority Review: ICT and digital technology are key to delivering on the outcomes of the Service Priority Review in delivering a more efficient, collaborative, adaptable and outcomes-based public sector. This is also key to State Government's strategic priority delivery of different, better and more affordable services. We therefore recommend ICT and digital technology be given specific visibility and focus and part of this process and in addressing the subsequent recommendations.

Premiers Roundtable - ICT & Digital: In view of the massive impact and opportunity represented by ICT and digital to the WA economy, we recommend a specific Premier's Roundtable be hosted either by the Premier or the ICT Minister on behalf of the Premier.

Further Recommendations

Public Sector ICT Delivery

- Champion innovative initiatives that will improve capability, performance and outcomes across Industry and Government.
- Continue to promote and explore collaboration opportunities across government on an ongoing basis to position WA as a progressive and outward looking jurisdiction.
- WA Government must keep pace and/or leapfrog other jurisdictions in relation to public sector ICT outcomes to deliver better and more diverse services to the WA community.
- Deliver disciplined and targeted reprioritisation of both effort and expenditure to achieve pragmatic and cost effective investment in public sector ICT delivery.

State Development

- Develop a Strategic Plan for WA to exploit our many strategic advantages such as our time zone, our proximity to Asia, natural resources, industry specialisations, and our world class engineering, research, business and technology capabilities, and the enabling role of ICT and digital in realising this vision.
- Work to develop a positive and responsive technology environment in WA that drives innovation, economic growth and job creation with thoughtful design and practical application of specific, deliberate and targeted measures, and encouraging learning and collaboration with others.
- Focus all areas of Government on WA becoming a regional hub for technology and as the gateway between Asia and the rest of Australia.

Industry Development

- Work with AIIA and industry to build a strategy and real working plan for an ecosystem that ensures Startups, Scale-Ups and SMEs remain and reinvest in WA.
- Work with industry to develop strategies to reduce 'brain drain' and keep skills in WA, invest in up-skilling existing businesses and individuals, step up investment in digital skills and ultimately develop new export or exportable capabilities.
- Continue to work with AIIA on ICT procurement reform as an area of sustained focus.

Smart State

- **Smart Cities & Smart Transport:** Develop a pragmatic and outcomes focused Smart Cities & Smart Transport strategy for WA that leverages smart technologies, transport and planning to create modern, vibrant, liveable, connected, green and collaborative cities that will underpin the future prosperity of WA.
- **Smart Industries:** Work with industry on ways to leverage our highly skilled engineering, business and technology talent, our industry specialisations, our world class research and entrepreneurial drive to maximise WA's opportunities to tap into massive emerging industries in defence, agricultural technology, advanced manufacturing, biomedical and industrial automation.
- **Smart Infrastructure:** Ensure future capital works projects have a minimum of 2% set aside to apply smart instrumentation (Internet of Things) and Data Analytics, in order to provide ongoing monitoring, reduce maintenance and maximise the life cycle of the infrastructure implemented and ensure value for public monies invested.

Jobs & Skills

- Work to develop a skilled workforce that can both 'create' and 'consume' technologies that maximise human and economic potential for WA.
- Continue to expand and promote STEM/STEAM education and vocations in WA.
- Ensure smart and supportive pathways for ICT related careers and/or skills in addition to STEM/STEAM.
- Ensure graduates are prepared for and have ready access to ongoing learning and career evolution.
- Work with AIIA and Industry on initiatives such as recognised certifications, procurement preferences, governance, salary and contract rewards and promotion of industry based certifications and reskilling opportunities.
- Work collaboratively on initiatives to drive equality in remuneration, recognition and opportunity across society.

Culture, Attitude & Mindset

- Encourage and/or invest in programs and policies to grow our entrepreneurship, intrapreneurship and commercialisation skills, and support our transition to a 21st Century global economy.
- Learn from Industry and/or teach Government broadly to take calculated risks, validate assumptions, measure results, confront failure early, learn from our mistakes, accept accountability, avoid blame, work collaboratively and challenge entrenched beliefs and practices. Industry can assist here with learnings from cultural changes/shifts of their own in this space as the transitioning of WA's economy has necessitated many of these changes.
- Better identify and reward our local thought leaders and action leaders, and celebrate our incredible talent. Make room for innovative ideas and encourage entrepreneurial thinking in everything we do. Leadership needs to be shown at all levels - from Government, industry, universities, schools to households.

The Future Awaits...

Now more than ever we must move fast to set our course...
or risk being left behind.

Our ongoing prosperity hinges on our ability to innovate,
which in turn will drive jobs, growth and importantly,
our global competitiveness.

We look forward to working with the Government to
improve our ICT performance and collaboration,
enable our transformation into a 21st Century global
economy, and deliver a truly fresh approach for
ICT & digital technology in WA.

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