Digital Economy Strategy Discussion
Western Australian Government Submission

The Future

The 'Digital Economy' is a catch-all term, which describes a transformative change in the structure of world economies, driven by emerging technology. This change is sometimes referred to as the'fourth wave', or 'fourth industrial revolution', as it represents a paradigmatic change comparable to three prior: oil and gas-powered industrialisation (the first wave, 19th Century); electricity-powered automation (the second wave, early 20th Century); and computer-driven digitisation (the third wave, late 20th Century). Oil, electricity and silicon were the fuel for the first three industrial revolutions, and so, in turn, the fourth wave is driven by a new power source data.

The power of data in the modern world is the result of a natural intersection of three major trends proceeding from 'third wave', computer-driven change. These are enormous and ubiquitous computational power; mass-digitisation; and unprecedented levels of interconnection.

Modern computers range enormously in potential power, size and use. We now build computers which can process data from 600,000 galaxies (for example, Western Australia's Pawsey Supercomputer, with data from the Square Kilometre Array), we build computers that fit in our pockets and on our wrists, and we build computers that fit into tiny places – even at the molecular scale. The practical upshot of this is that we now use computers to do almost everything at some level or rely upon systems that do.

As a result of this rapidly increasing digitisation, of using computers for more and more things, we now create an enormous volume of digital data that did not previously exist. At a fundamental level, digital data is what all computers work with – and the more computers we use, the more data we create for an ever-expanding range of things. IBM estimates that 90 per cent of the data currently in existence was created in the last two years, and that the total is increasing by 2.5 quantillion bytes a day -– roughly equivalent to 57.5 billion full 32 gigabyte iPads.[1]

The final aspect of the 'fourth wave' is that all this new data is not merely located in the system which generated it – it is connected up via the internet with millions upon millions of other systems, all contributing data of their own. What began as a 'network of networks' between research institutions in the 1970s is now on track to hit more than 20 billion connected devices by the end of 2017.[2] This massive level of interconnection means that data is available not just for each individual source – but also for how they all relate to each other. To take the analogy of a chess board we do not just have data on each individual piece, and its rules – but also for all the millions of potential ways those pieces can interact.

Taken together, these three things – the creation, processing and interconnection of data – have created a paradigm shift that is greater than the sum of its parts.

An early, and still relevant, example of 'fourth wave'change at work is the Uber ride-sharing service. Uber uses enormous computational power (on its own servers) to process and optimise hundreds of thousands of journeys in real time. It can do this, not just because

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[1] IBM, "Ten Key Marketing Trends for 2017".
https://public.dhe.ibm.com/common/ssi/ecm/wr/en/wrl12345usen/watson-customer-engagement-watson-marketing-wr-other-papers-and-reports-wrl12345usen-20170719.pdf

[2] Information Handling Services (IHS) Markit, "IoT Trend Watch 2017". https://www.ihs.com/info/0117/IoT-Trend-Watch-2017.html

powerful computers exist, but also because the real-time location data exists (from users and drivers), and because all of those sources of data (smartphones) can connect up and communicate with each other simultaneously. When 'location' first became possible through GPS on phones, the best idea available at the time (aside from digital maps) was to show discount vouchers when users were near a coffee shop – now it drives a multi-billion dollar global logistics business.

Similarly, nascent fourth wave technologies, such as artificial intelligence (computer programs that can adapt and 'learn' to perform tasks previously requiring human intervention) are only in the early stages – and their full impact is yet to come. Artificial intelligence (AI) is already at work in many commonly used services – for example, it is what drives new photographic recognition engines, such as those in Apple and Google Photos. The AI in these applications can identify (and make searchable) the contents of photos based on the image alone – without a human having to manually apply a category or label. The 'engine' of artificial intelligence capabilities such as these is the sheer volume of data that is now available to run through them.

With more and more data, computer programs can be 'trained' to identify and compare a wide range of things that would previously have had to be manually handled by humans. Another example is the impending arrival of self-driving cars. The computers and sensors in these vehicles can process and perform the task of 'reading' the road and driving the vehicle, which previously required a human driver. This, again, is possible because of the intersection of processing power, data, and always-available internet connection. The number of potential applications for this kind of technology is enormous.

With lightning-fast, accurate and always available analysis of vast linked datasets, the way we approach planning, decision-making, research, social interaction, business development, policy and policy implementation (to name just a few) will radically change. This kind of technology, driven by data, and performing tasks that previously required human work, is exactly why data is creating a new industrial age. Just as electricity powered machines were developed to do the work of thousands of people in manufacturing, so data-driven interconnected computing will soon be able to do the work of potentially millions of workers – up to and including those with knowledge-based careers.

Equally, there will be new kinds of roles – and augmented capabilities within existing ones – that may create new opportunities that were previously unimaginable. Gartner has predicted that 1.8 million jobs are likely to be lost to AI and data-powered automation by 2020. They have also predicted the same technology will create 2.3 million new jobs in the same time frame.[3] What these jobs will look like, what skills will be required to do them, and what kinds of supporting frameworks need to be in place for Australia to manage the transition are all key questions for Government from this point on.

Perhaps the most important thing to remember in approaching all aspects of this 'fourth wave' transition – of the new digital economy – is that technology is a tool. Much as the relentless march of scientific progress may appear to have a life of its own, technology is not inherently self-sustaining or self-directing. It is a tool which is used by humans, and directed by them to achieve human-determined ends. As such, it is the choices we make about how we put technologies to use that carry moral weight – and for Government, the central driving question must be, does this serve the public good?

The component parts driving the digital economy are already being built and deployed across the globe – the infrastructure and technology layer that sits behind the tantalising emerging possibilities is largely in place (or will be soon). There are many areas where government in

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[3] Tech Republic. "AI will eliminate 1.8M jobs but create 2.3M by 2020, claims Gartner"
   https://www.techrepublic.com/article/ai-will-eliminate-1-8m-jobs-but-create-2-3m-by-2020-claims-gartner/

Australia must still press forward in its commitment to enabling investment (such as with the National Broadband Network, and Cyber Security), which will be discussed in this paper, but there is as much (if not more) work also to be done in largely non-technical areas.

The opportunity we have is to change how we work with each other, and use technology to drive that change. Ultimately, as with all change, the transition we are currently making is one driven by people – and if it makes life worse for most people, or they realise little meaningful benefit, it is no good. The private sector tends to hone more closely to strategy driven by people's actual needs, because if a business does not meaningfully improve the life of its customers, it is usually not long for the world. Unfortunately, this exact focus can also produce perverse outcomes for society, in instances where the beneficiaries are concentrated (shareholders or owners), and societal cost is large (loss of jobs).

Government needs to do better at the best aspects of a people-driven approach to ensure it stays relevant, and can act to preserve the public interest. It needs to focus less on internal process and back-end management, and more on public service: what the experience of the public is, and how to deliver it better. Government is the rightful custodian of the public good. In the context of radical digital change, this must translate into meaningful engagement with the needs of the populace that goes further than a scattergun (and often outdated) approach, arguing over one or the other new technology.

The technology layer is becoming mature – the fourth wave is built on enablers that are far from new. Government needs to get its head out of the trenches, transcend its outmoded structures and processes, and assume its place as a nimble champion for the public interest amidst a throng of innovative peers. Getting from where we are now, to that vision, is what the Western Australian Government believes a Digital Economy Strategy should aim to achieve. The following pages provide a brief overview of strategic opportunities that can be grasped right now, to steer us on the right path.

Digital and the Economy

Whilst 'digital economy' refers to nascent technological change, it is, and will continue to be, very much a part of the 'economy economy' not a separate and discrete entity. This is an important point to make, because it gets to the heart of a problem that has plagued 'digital' initiatives since such endeavours began. In short, digital tools and processes are often erroneously treated as inherently separate to the broader operation of a business, or the context of a user's everyday life, and siloed off in environments characterised by obfuscating, jargon-heavy language and technical detail. The more cutting edge and untested a technology is, the greater the risk of it being misunderstood, misapplied, or outright ignored due to lack of understanding.

This is an issue for businesses, where 'digital' is tackled as a problem in isolation, rather than as part of ordinary business risk management and strategy, and it is potentially a problem for economic strategy as well. Now, more so than ever, digital tools are a facet of almost every aspect of society and the economy and are only likely to grow more integrated over time, as the 'fourth wave' discussion above serves to indicate. It is important to consider, and strategically frame, digital initiatives as components of overall economic strategy and ensure they are understood and implemented everywhere, not just in technical circles.

In line with this observation, this submission is not intended to provide a comprehensive and detailed enumeration of all the various technological opportunities currently presented to Western Australia, and the nation as a whole. The Commonwealth discussion paper details a number of technologies (and related initiatives) that are reasonably likely to form part of Australia's future digital activity, as part of a broader narrative of technological change – but discussion of specific technologies is less important to a strategic document than capturing that narrative, and connecting it up with current areas of work.

Western Australia recommends the final Strategy to focus primarily on high-level positioning, with specific technologies included only so far as they support the overall narrative. Western Australia recommends the below outcomes as key considerations for a successful strategy to harness the economic opportunity of digital technology:

- Non-technical understanding of digital opportunities

- Training and workforce development to ensure no-one is left behind

- Stability and efficiency through shared standards

- New insights through better data and privacy

- Better services through user-centred design

- Cyber security

- Future-ready infrastructure

Non-technical understanding of digital opportunities

The Strategy should call for digital initiatives that are grounded in technical accuracy, but communicated with clear, concise, jargon-free language that creates an approachable experience for non-technical audiences

One of the biggest problems with digital technology (and technology in general), is that it typically appears complex, unapproachable and intimidating to people without specific knowledge in the field. This need not necessarily be the case, however the steady 'personalisation' of computers, and their integration into everyday life (predominantly via smartphones) shows the value of building products that are widely understood.

For each new technology, there is a gulf of understanding and communication between those who conceive of and build it, and those who could potentially benefit from its use. Technical experts (coders, software engineers, ICT managers, etc) are often well-equipped to understand the complexities of an emerging technology, but ill-equipped to understand the business context in which potential solutions sit, or communicate with the non-technical staff to develop a business-led digital strategy.

Experience from the ICT reform process within the Western Australian public sector has shown that ICT teams and business units typically struggle to communicate and ICT decision-making, procurement and support is not well aligned to business needs. ICT teams end up maintaining existing, legacy systems, because they are all the broader business knows to ask for – or approvals for better solutions founder due to poor communication of benefits and risk.

This is a situation that is almost certainly common to technical and non-technical interactions across all sectors of the economy, and applies equally to businesses of any size. Even where there is no dedicated ICT support, the lack of an approachable explanation of the benefits and costs of new technology is often a barrier to non-expert users.

In order to be effective, the Strategy must seek to change this fundamental dynamic by giving prominence and weight to the need for a non-technical approach to seizing digital opportunities.

Training and workforce development to ensure no-one is left behind

The Strategy should encourage the Commonwealth, education providers, States and Territories to collaboratively design holistic, flexible and rapid approaches to training - both for new workers, and those in transition from disrupted roles.

As with previous waves of technological change, there is little sense in attempting to halt, or isolate from, data-related innovation. In fact, acting early to establish a leading position can pay dividends by servicing a market with high demand and low supply. As changes stabilise, and new workforce requirements arise, Australia should be positioned to transition workers into new roles as efficiently as possible.

Traditional approaches to training and workforce development (such as subsidisation and incentives for certain industries) are likely to be too slow to provide adequate transition, if the pace of change is as rapid as predicted. This is compounded by the fact that, until the point of actual transition, workers will still be required in traditional roles – and market forces will draw workers to those positions while they last.

Bearing this in mind, a strategy for the digital economy should give priority (and funding streams) to rapid re-skilling programs, developed in partnership with State Governments and education providers. In particular, these programs should offer flexible training that can be integrated into a broad variety of existing work patterns.

Consideration should also be given to addressing the high level of specialisation in some areas of education, training and development. Whilst many technical roles require skillsets that only specialised training can provide, there is a growing need for even the most specialised of roles to be able to adapt and interact with emerging trends (and other people). A more holistic approach to education, which continues to build broad, cross-over skills throughout, would be valuable – and position Australia's workforce well to adapt to coming change.

Overall, government must act to ensure that no-one is left behind in the coming wave of data-driven digital change. The question, as always, is "does this serve the public good?". New technological advantages are only advantages to Western Australia if all Western Australians stand to benefit from them. If they are only available to a few, they will be drivers of disadvantage, inequity and (in raw economic terms) poverty—rather than opportunities to create a better more productive society. Currently, a small number of large private companies continue to accumulate data, data expertise, and high levels of control over emerging data-driven markets. When combined with technological barriers (such as lack of adequate infrastructure, and the cost of access to, and expertise in, modern computing), these factors raise the spectre of a future wedge driven through society—a digital divide, between those that have access and knowledge, and those who do not. This cannot be allowed to happen, and Government is in a position right now to put steps in place to ensure that it does not.

It is important that government continue to support innovation in the data space – but not at the expense of job security and economic opportunity for all Australians.

Stability and efficiency through shared standards

The Strategy should espouse a light-touch approach to regulation and standard setting, that enables interoperability and collaboration via established international standards, without mandating burdensome technical compliance.

Standardisation is, broadly speaking, a positive development for burgeoning technologies. On the basis of a widely adopted standard (e.g. Bluray discs, HTML 5, Unicode, ISO standards),

industry, government and citizens can adopt a technology with greater certainty that their investment will continue to be supported and effective.

At the same time, standards should not be used as a mechanism for centralised control – or to stifle diverse and innovative solutions. Appropriate standards strike a fine balance between consistency and diversity, and require extensive consultation and a collaborative approach.

Government is well-placed to assume the role of facilitator in identifying and adopting standards, as it intersects with more areas of the economy than any other individual entity. The Western Australian Government supports the progression of commonsense standardisation, in line with international practice, and in partnership with relevant industry – as well as State and Territory Governments.

New insights through better data and privacy

The Strategy should prioritise Government's role in collecting, preparing, sharing, protecting and releasing data, as a public good and key enabler for the digital economy.

The collection of more and more data as new sources come online will add to an already very significant volume held by governments (State and Federal) across Australia. Most government agencies retain datasets of significant size, often stretching back many decades, which despite notable progress in some areas, are typically not well-utilised, nor shared effectively between agency and jurisdictional siloes. As privately-held data continues to grow in size and influence, and technology-driven companies move further into spaces previously dominated by government and not-for-profits (for example, health care), it is increasingly important that government's own data capability should significantly rise. If government is to effectively serve the public, and protect the public interest, it must be able to interact with and counterbalance the growing strength of privately owned data.

Open Data

Where data is publicly released, it facilitates the development of tools and services outside of agencies, which often serve the public at no extra cost to gvernment. A common example of this is the publication of public transport stop location, timetabling, bus and train location data – which feeds into commonly used mapping and route planning applications developed by third parties. Access to government services improves, without a corresponding rise in cost.

Data is often described as a critical resource for the information age, analogous in value to oil during the industrial revolution. Unlike oil, however, data can be in more than one place at once and often increases in value the more people have access to and use it. It is also the case that large volumes of data, across a wide range of areas, is collected and acquired by private companies (tech giants such as Facebook and Google being prime examples), and has significant commercial value. The accumulation of data within private sector silos is potentially just as detrimental to long-term public benefit as it being locked up in the public sector. It also has significant implications for competition in the market, as high quality data increasingly becomes a key requirement for all businesses.

In this context, government has the opportunity to significantly level the playing field and improve service delivery in the process, by publicly releasing large volumes of high quality data. This will enable a wide range of stakeholders, including private businesses, not-for-profit organisations, and other Australian governments (for example, the Commonwealth) to design better products and services based on better data. In terms of immediate stimulus to the digital economy, the Western Australian Government believes that more and better public release of data is one of the most obvious steps for government to take. A clear, high level encapsulation of this sentiment would be a valuable addition to a strategy for the digital economy.

Privacy

As government starts to make better use of its data reserves, and consider the option of public release, it is vital that privacy be at the forefront of its practice and also that this be communicated to the public. If government is not able to establish and maintain a guarantee of privacy for data, it will lose the trust of the public, which will in turn frustrate the potential of data-driven services. Users will become more cautious about sharing data with, and using, services that have proven to be insecure.

The Western Australian Government is currently in the process of revising and updating its sector-wide approach to privacy, seeking to rigorously protect citizens' data, whilst also unlocking its potential for better advice and service delivery across government. A properly designed approach to privacy will protect sensitive information without constraining new and better data sharing and research.

It is important for all States, Territories, and the Commonwealth to be cognisant of privacy, as the public does not always distinguish between State and Federal jurisdictions. High profile privacy breaches, or failures of data management, have the potential to undermine trust in government as a whole, even if they are limited to one agency in one particular jurisdiction. This will have a knock-on effect for the digital economy, as low trust is likely to stymie the use of more efficient services, which would otherwise contribute to time and cost savings.

Data sharing

It is important that government agencies are able to share data amongst themselves and especially so for datasets which may be sensitive, and inappropriate for open public release. Sharing of data will enable all agencies and governments at all levels to make decisions with as much information as possible on the table. This means that agencies will need to work to establish standards for handling and labelling of data, as well as shared platforms to maximise interoperability.

The Western Australian Government supports recent moves by the Commonwealth Government to simplify and streamline its data classification framework, and align its overall operation towards data sharing, and away from the military and national security space it has traditionally occupied.

The complex and granularly detailed requirements laid out in the (yet to be amended) Protective Security Policy Framework, which covers data classification and a range of other protective measures, have proven overwhelming and largely irrelevant at a State level which led States to draft their own, higher level policies. Unfortunately, this has resulted in a frequently confusing and inconsistent array of codified approaches to data sharing, which obfuscates progress towards greater inter-jurisdictional collaboration.

This is a good example of how a clearer, higher level, more strategically coordinated approach by the Commonwealth would create a system with broad benefits for all involved. The Strategy should reflect the value of a collaborative approach to data, built in partnership with State Governments, and sensitive to the needs of all.

Data Analytics

The end-goal of better data practices, privacy and sharing is to be able to combine and analyse datasets from a wide range of disparate sources, and use the insights gained to tackle long-existent, systematically complex problems.

This 'big data' approach is an opportunity for State and Commonwealth public sectors to fundamentally rethink their agency-siloed structure of service delivery. With advice and

solutions that are grounded in rich data from a wide range of policy areas, government will be equipped to target and coordinate resources with greater efficiency and less duplication, as well as measure their effectiveness and adjust accordingly.

For data that is publicly released, the same kinds of analytics will be possible for a wide range of businesses and Non-Government Organisations (NGOs). In one recent example of this from the United States, an NGO was able to collate, analyse and visually represent spending data across local, State and Federal agencies, to provide an overview of the work of government, publicly available at http://usafacts.org . Much of the project's total cost was bound up in sourcing, cleaning and standardising the data from various sources. If government was able to publicly release its data in machine readable, open source formats, the process would be even more efficient.

From an economic standpoint, the benefits are twofold. Firstly, addressing inequity, disadvantage and other social policy challenges will result in a more capable, more self-reliant citizenry which in addition to the obvious wider social benefits is more likely to generate a higher economic output. Secondly, the availability of high quality government data is likely to increase the value of data-driven products and services targeted at the Australian market, and also the quality of those built by Australian companies.

The Western Australian Government recommends that the Strategy provide a clear position on the economic benefits of privacy, sharing, public release and analytics for government data and that this be adopted as a template for driving better high-level collaboration between the Commonwealth and the States and Territories.

Better services through user-centred design

The Strategy should endorse an approach to government online service design that focuses on what is best for the user, not the agency.

As more and better data is integrated into decision-making, and digital workflows become the norm, it is important that government successfully translate these 'back end' improvements into services that are meaningfully better for users.

Digital services can make it easier, quicker and cheaper for individuals and businesses to access information, obtain approvals and licences, and transact with government. The overall cost to government is likely to be lower, especially over time as the initial cost of transition is absorbed – and government will be able to expedite common processes for citizens and business, rather than act as a barrier.

In order for digital transformation of services to be effective, however, they need to be easy to use and easy to understand, not simply a replication of existing bureacratic processes in a digital context.

Businesses and citizens are already accustomed to the efficiencies of digital service delivery from non-government sources, even if they are yet to fully implement them in their own practice. Common experiences like online shopping, accessing 24/7 information via mobile platforms, or interacting on social media have long since set the bar for service delivery significantly higher than most government agencies are currently capable of providing.

As data practices improve, and digitisation increases, agencies will be in a position to provide more and better online services. These services need to be designed from the outset with a 'user centred' approach. This means design that starts with what a typical user might want to achieve, and then builds the service to make that easy—putting the burden of understanding on the government agency, not on the user.

If digital services are designed in this way, the benefits of high quality digital services are much more likely to expand into the broader community (and economy in general), because people will use them – and save time and money when they do.

Cyber Security

The Strategy should promote the Australian cyber security industry as a cornerstone of the digital economy, creating new categories of employment and ensuring the ongoing stability of existing businesses and government.

Digital technologies, and their associated innovations, have for some time acted as a two-pronged force upon economies across the world.

On the one hand, new digital industries have emerged as powerful economic drivers in their own right. Development and maintenance of digital systems (hardware and software), and new kinds of services built around new technologies (for example, personal GPS location) are growing sources of profit, employment. Simultaneously, traditional industries and established businesses are moving to increasingly digital-centric workflows, because they need to do so in order to stay competitive.

The practical upshot of this mass digital migration is that breaking and compromising the security of digital systems is now a far more fruitful exercise than it used to be. Using digital currencies, cyber criminals are able to profit from their activities – both through ransoms, or by pre-packaging cyber attacks for sale on the dark web, outside the reach of law enforcement and institutional financial controls. The value of the systems that such attacks can compromise has also increased, and the combination provides a powerful market driver for cyber crime that did not previously exist.

As a result, cyber security is an increasingly critical component of Australia's national economic security. If the security, integrity and availability of digital systems, and the data they contain, cannot be maintained, there is a profound risk of catastrophic damage across all areas of Australia, and Western Australia's, economies. The alternative – to avoid using digital systems – is not an option either, as to do so would destroy our ability to compete in a global market.

Cyber security (both the activity and the industry) is thus at the centre of both the new and old components of our economy. It is a new, burgeoning industry with enormous growth potential, and also a critical requirement for all existing industries.

Investing heavily in cyber security capability, and creating a skilled workforce of cyber security professionals in Australia, will serve both old and new drivers in the economy, and secure our short and long-term economic prospects.

Western Australia already has a first mover advantage in the cyber security industry. The State is home to one of the pre-eminent cyber security research and education facilities in the world, at Edith Cowan University's (ECU) Joondalup campus, and graduates are frequently employed even before their studies are complete.

Building upon expertise such as those found at ECU, and further supporting the development of institutional knowledge centres (as the Commonwealth has previously done, via the Collaborative Research Centre initiative) will be a vitally important component of the success of any strategy for developing the digital economy.

A digital economy without cyber security is a disaster waiting to happen, and the cyber security industry itself is an economic growth opportunity. The Western Australian Government strongly recommends that cyber security be a major focus of the Digital Economy Strategy.

Future-ready Infrastructure

The Strategy should clearly establish and endorse key infrastructure requirements for Australia to grow its digital capability, including the National Broadband Network, regional telecommunications and smart sensor technology on government projects.

The National Broadband Network (NBN)

Digital technology is frequently described in terms which suggest it is ever-present, always 'on', and universally accessible. However, these things are only true so long as the requisite supporting infrastructure is in place. In areas where telecommunications infrastructure is limited, slow, expensive, or completely unavailable – of which there are many in Western Australia – there is little chance for citizens and businesses to take advantage of the benefits of digital innovation.

The largest, and most obvious example of digital infrastructure in Australia is the NBN. One aspect of the NBN which is worth reiterating in the context of a potential Digital Economy Strategy is that it is a critical enabling requirement for a wide variety of economic activity, not easily captured in the immediate cost/benefit analysis of rollout budgeting. Conversations around the funding and performance of the NBN frequently turn on the ability of the project to deliver 'return on investment' to Government – defined in terms of immediate cost-recovery via sale of NBN products. Whilst it is of course desirable that the project not run over budget, it should not be forgotten that there is a far wider range of short, medium and long-term benefits to a fully realised NBN than the immediate return of Commonwealth funds.

For Western Australia in particular, as one of the most remote political jurisdictions in the world, the value of having high speed, high capacity internet is immense. Western Australia has been an economic powerhouse in Australia for many decades, fuelled by its natural resources, and international investment. With the addition of world-class communications infrastructure, the State's natural lifestyle advantages and 100 per cent time zone parity with Asia present real opportunities to attract, retain and home-grow global companies on Australian shores. Without the infrastructure, the State will be left in the slow lane of the world economy – to the detriment of all of Australia.

As Australian businesses further embrace digital efficiencies, and new industries flourish with the advent of universal high-capacity broadband, State, Territory and Commonwealth Governments are highly likely to benefit from the economic stimulus from multiple avenues.

The Western Australian Government encourages the Commonwealth to emphasise the role of high speed, high bandwidth internet infrastructure in the Strategy, and treat NBN as a critical enabler for the future economic prosperity of Australia.

Regional Telecommunications

Internet infrastructure is also particularly important in regional areas. Residents in regional, rural and remote Western Australia arguably have a greater need for broadband in the absence for equitable access to physical services. A connected regional WA not only has inherent social inclusion and public safety benefits but also allows produces a sustainable environment for communities and businesses to grow and prosper in the global digital economy.

Mobile connectivity also has greater utility in regional areas due to the difference scale and nature or regional workspaces, the long distance people travel to service centres and the length of time spent in relatively isolated situations.

NBN Sky Muster's large footprint in regional Western Australia does not adequately cater to businesses with a true enterprise grade service. Ideally businesses should have fast, reliable affordable and scalable internet connections with sufficient network capacity to handle large amounts of data, in real-time without delays. Enterprise grade service for regional businesses is essential for their sustainable growth – and also an important equity issue. With better internet access, there is significant opportunity for remote locations, including indigenous communities, to engage with the broader economy.

Internet infrastructure is also critical to the ongoing viability of Western Australia's $5.5 billion agriculture industry. With the digitisation of primary production systems, Sky Muster will struggle to meet the growing data needs of primary producers. A strategy should be in place for proactive measures to switch regional areas to non-satellite technology, and preserve Sky Muster for areas where it is truly the last resort.

While ubiquitous mobile coverage is unaffordable based on current technologies, the Western Australian Government is committed to improving regional telecommunications through strategic co-investment opportunities incorporating existing, and emerging technologies.

Further improvements to the regional telecommunications market can be realised through regulatory measures aimed at reducing the cost of backhaul rates on intra-regional routes that are currently unregulated.

Sensors for data collection

One of the key opportunities presented by modern computing is the ability to process and interpret large volumes of data from numerous sources ('big data') to reveal significance and generate insights at system-level scale. The most important prerequisite for this to be realised is that relevant data must be available for as many areas of potential interest as possible.

In terms of infrastructure, this translates into a need for a wide range of sensors on objects and systems (for example, roads, buses, environmental monitoring, public spaces and so on) that are able to provide data, for integration into large-scale analytics. Where government is involved in planning and infrastructure, inclusion of sensors should be a basic level requirement. As more and more sensors come online, and are available for government analytics teams (and public release where appropriate), more and richer insights, advice and services will be possible as a result.

Discussion of this aspect of government investment is predominantly conducted under the labels of 'Smart Cities' and 'the Internet of Things', with an emphasis upon local government and planning involvement. The Western Australian Government encourages the Commonwealth to take up this discourse and connect it with wider elements of digital economic planning in the Strategy, to enable future data-driven opportunities for the Australian economy.

Conclusion

A Digital Economy Strategy for Australia should provide a clear, high level vision for the nation's economic future, interpreted through the lens of digital technologies. It should be grounded in foundational opportunities and requirements, such as cyber security, but also be fundamentally designed to drive better technology into the mainstream.

It should not be a technical manual, or an exhaustive list of potential opportunities, but rather a compelling narrative, articulated in easy to understand language, and communicated as widely as possible. It should also be built upon a strong foundation from within government, of generational change to new, digital tools and ways of working.

There will always be cutting edge technologies capable of increasing efficiency and generating new insights, but their potential is not realised until they are adopted at scale. If Government wishes to drive a strategic agenda – to build economic strength on the back of digital technologies – this is the biggest challenge: to take technical potential, and build a path between it and the wider economy.

The fourth wave of industrial revolution is upon us, and government must act – both to enable the ongoing strength of Australian businesses and workers, and to ensure that government itself is able to operate as a champion of the public interest in the digital economy.

The Western Australian Government provides this submission in service of that aim, and looks forward to a fruitful and productive relationship with the Commonwealth as it develops and implements the Digital Economy Strategy.

Office of the Government Chief Information Officer
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