14 December 2017

Digital Economy Strategy Team
Department of Innovation, Industry and Science
GPO Box 2013
Canberra ACT 2601

By email: digitaleconomy@industry.gov.au

Dear Digital Economy Strategy Team

Microsoft welcomes the opportunity to make a submission to the Department of Innovation, Industry and Science on the Digital Economy Strategy consultation paper.

Please find attached our submission. For any questions or queries, please don't hesitate to contact us.

Yours sincerely

Belinda Dennett
Corporate Affairs Director

Introduction

Digital technologies are having a profound impact on the lives of virtually all Australians. While they have enormous potential to drive further economic growth in Australia, this needs to be balanced with the potential impact on people's lives and careers. Technologies such as cloud-based software and services, artificial intelligence, mixed reality (virtual and augmented) and 3D printing are changing how we live and work at an unprecedented pace. In fact, technological change is transforming whole industries and business models, creating new sectors and jobs, while some functions fade into history. And it is not just the private sector that is tapping into these digital opportunities. The public sector is also realising the benefits of technological adoption to provide more targeted, citizen-focused services. As a massive driver of increased productivity overall, many are referring to the current digital transformation as the fourth industrial revolution.

In this rapid period of change, there are legitimate concerns that people have about their future and the security of their jobs. But we also know that with the right framework in place, Australia's workforce will be in a stronger position to take full advantage of the digital revolution.

In this context, Microsoft Australia welcomes the opportunity to respond to the Federal Government's Digital Economy Consultation Paper and to assist with the development of a national Digital Economy Strategy. There have been many public and private sector reports over the years that have discussed the digital revolution and what Australia needs to do to be on the front foot. While these have been helpful in articulating the digital challenges at a broad and intellectual level, Microsoft believes that it is critical for the new Strategy to become a living, interactive and action-oriented document that delivers practical ideas and solutions. It should be a document that inspires people to do things differently and one that provides a behavioural change pathway for individuals, businesses, community organisations and governments to take full advantage of the digital economy.

For this reason, we have deliberately shaped our response to include real life projects and initiatives that we at Microsoft have led or been closely involved within Australia and around the world. Projects that are already successfully helping students, adults, businesses and whole communities commence or continue the journey of digital engagement and advancement. Rather than just offering recommendations, we feel the best contribution Microsoft can make to this debate is to share our direct digital engagement experiences and offer suggestions based on insights we have gained from these successful digital projects. For this submission, we have focused on five key and interrelated areas that are essential to the digital economy: government as a leader on digital transformation; skills development; support for start-ups and entrepreneurs; diversity and inclusion; and the impact of Artificial Intelligence.

Government as a Leader on Digital Transformation

With digital transformation now the major disruptive force in the Australian economy, it is incumbent on the Australian Government to participate fully in this transformation. If Government is to truly understand and positively influence this activity, it must itself be an exemplar in the adoption of digital technology and transformative work practices.

Deep engagement with emerging technologies like Artificial Intelligence and the cloud is the best way for Government to truly understand the implications of such technology for the Australian economy and society.

Through our investment in new, highly secure Azure cloud regions located in Canberra Data Centres and in the Information Security Registered Assessors Program (IRAP) assurance process - Microsoft is working to create trusted platforms that enable Government to adopt digital technologies while ensuring the highest levels of security and compliance with Agency policies.

The Government can also lead by developing platforms and policies that will be leveraged by other sectors of the economy, particularly in areas like identity, cybersecurity and data.

On Identity, Microsoft welcomes the Australian Government's Trusted Digital Identity Framework, developed by the Digital Transformation Agency, as an important step in create a national framework for the development of trusted identities that can be leveraged by all levels of government and industry.

Addressing the current complexity in verifying your identity to Government in Australia would see dramatic improvements in productivity across the economy and open up opportunities for more connected service delivery to citizens.

Through this process, the Government must ensure that it does not get out of step with the broader economy and that the complexity of the identity requirements is commensurate with the risk of the transaction. An overly complex governance arrangement will also deter the private sector from exploring how to integrate with government digital services.

The community already looks to the Government on Cybersecurity. Policies and guidance from the Australian Cyber Security Centre (ACSC); Attorney-General's Department (AGD) and the Australian Signals Directorate (ASD) are already leveraged heavily by many other sectors including telecommunications, IT, financial services and utilities.

Ensuring that security policies and controls are balanced against appropriate treatment and management of risk is critical to Government adopting modern digital technologies and demonstrating to the rest of the economy that innovation and security are not mutually exclusive.

Microsoft already partners with Government in Australia and elsewhere to demonstrate how digital technologies can be utilised securely through assurances processes like the IRAP assessment process; and to share information about security best practice and emerging threats.

Finally, Government can create significant economic opportunities by better leveraging its existing Data assets more effectively and opening up more unclassified data for public use. Already we have seen the benefits of governments across Australia opening up geospatial, environmental, transport and demographic data. The Bureau of Communications and Art Research (BCAR) in the Department of Communications and the Arts estimated in 2016 that open data could generate up to 25 billion per year or 1.5% of Australia's GDP[1].

Creating trusted open data platforms like data.gov.au enables third party developers, researchers and enterprises to innovate and drive broader value out of those data sets. With the advent of machine learning and artificial intelligence, there is even greater opportunity to drive insight and value out of open data sets. The benefits of open data are clear, but Government must also ensure that it maintains the community's trust around the release of data by ensuring that appropriate privacy safeguards are in place.

Skills development

As digital transformation hits the workplace, the skills people need to not only make a living but also thrive are changing. Different groups of Australians will be affected in different ways. For instance, young people face a future where they will be in roles that did not exist when they started school – and already the private, public and not-for-profit sectors have been encouraging the development of STEM skills and digital literacy, acknowledging the growing importance of such skills.

[1] Department of Communications and the Arts, Open government data and why it matters, February 2016.

For those already in the workforce, the situation is more complex. Some Australians will need to embark on new careers – in particular, those in sectors already in decline or facing significant change as a result of technology, such as the automotive sector. Others will see less job disruption as a result of technologies such as automation, and instead benefit from performing fewer manual, repetitive tasks, which allows time to use more of the innately human skills such a problem solving, building relationships and being creative.

In Australia, Microsoft strongly believes in building up both technical and enterprise skills for people to fully harness digital opportunities. We have incorporated this approach through a number of skill programs which have garnered positive results, for example targeting school-aged Australians and educators. These programs include:

- Microsoft Showcase Schools which lead the way in the best practice of technologies in the classroom and act as exemplars for teaching and learning for other schools. Teachers and IT Business Development Managers at these schools are proactive about upskilling their staff, administration and staying up to date on the best devices and software
- The Microsoft Imagine Academy prepares teachers, students and parents for industry-recognised certifications across Productivity, Computer Science and IT Infrastructure. The program aims to build students' confidence in digital skills such as coding
- The Microsoft Innovative Educator Program is a community of teachers who show expertise in teaching and learning with technology, to upskill fellow teachers.

Microsoft also has a number of digital technology programs aimed at university students in Australia including:

- Microsoft Protégé is an annual case study competition providing university students with the opportunity to apply skills to solve a real-life business problem. In 2017, the case study challenged students to create a digital transformation strategy. Students had the opportunity to choose from a range of industries including professional services, health, sport, retail and manufacturing. Finalists were invited to attend a one-day hackathon where they received mentoring and the opportunity to present to senior managers
- Imagine Cup is a global Microsoft competition that empowers the next generation of computer science students to team up and use their creativity, passion and knowledge of technology to create applications that shape how we live, work and play.

Microsoft supports the following initiatives to help better prepare Australians in meeting the changing digital skills demands as our workforce evolves:

- Reviewing and adjusting Australia's current apprenticeship system to reflect current industry requirements – for example, we support recommendations made by the Business Council of Australia in its report titled 'Future Proof: Protecting Australians through education and skills', which sets a vision of lifelong learning built on VET and the higher education system
- Continuing to grow the pipeline of young people interested in STEM, as well as improving the status of vocational training
- Supporting lifelong learning, including on-the-job training, to help future and existing workers prepare for the digital age
- Encouraging workforce planning, using labour market insights, to help retrain staff before it's too late.

Support for start-ups and entrepreneurs

Microsoft has a strong track record in facilitating entrepreneurship and supporting start-ups to take full advantage of the digital economy. We run several initiatives across the globe and in Australia to incubate and develop new enterprises from pre-conception through to mass market launch. Microsoft understands that start-ups are the primary drivers of innovation in society as well as the job creators, and that is why we place great emphasis on supporting them through our tools, access, programs and advocacy.

Some of the ways we provide support to help start-ups and entrepreneurs to deliver on their potential include:

- Microsoft Innovation Centres: partnering with local governments and partners in Australia (Adelaide and Brisbane) and around the world to help entrepreneurs build digital skills and become successful businesses. The centres provide access to resources for software developers, IT professionals, university students, academic faculties and entrepreneurs as well as providing selected start-ups the opportunity to pitch their business ideas to senior business people to help them scale their products, sales and ultimately their workforce
- Imagine: This initiative provides university students with Microsoft professional tools at no charge to help incubate great thinkers and great ideas. With these tools in hand, students are better able to develop their entrepreneurial dreams into reality
- BizSpark: this program offers software resources, technical support, mentoring and networking access to partners and customers for software to start-ups in their first five years of trading. The program takes an integrated approach bringing together investors, advisors, government agencies and entrepreneurs. Entrepreneurs are mostly recruited by Microsoft Network Partners, which serve as the entrepreneurs' sponsors and shepherds through the program.

Making sure no-one is left behind – a focus on diversity and inclusion

Technology is a great equaliser and if harnessed correctly, it can unlock new opportunities. The question is how do we engage with people from disadvantaged communities, those with very limited internet access and those with limited digital literacy skills? The challenge we face is ensuring every individual has the skills, knowledge and the opportunity to participate and benefit from the digital economy.

Limited access to digital skills threatens to widen the income gap between those who have the skills to succeed in the 21st century and those who do not. To reduce the gap, all young people need the opportunity to learn computer science, especially those least likely to have access. Microsoft is committed to helping close the opportunity gap for young people. We work with non-profits, educators, governments, and businesses to increase economic opportunity for underserved youth around the world.

We believe industry and Government have a big part to play in guaranteeing no one is left behind in the digital revolution. By fostering and supporting diversity and inclusion in workplaces, we can do a lot to bridge the gap for people who would otherwise be left behind.

Diversity and inclusion shouldn't be an add-on. By designing technology and services that meet the needs of people with accessibility requirements or with lower levels of digital literacy – you are ultimately designing digital services accessible to everyone. To assist organisations on this inclusive digital journey, Microsoft has developed the Inclusive Design Toolkit – a set of free resources to embed inclusivity into the digital design process.

Microsoft also actively seeks to foster greater levels of diversity in our workforce around the world and in our pipeline for future leaders. Some of the steps we take include:

- Encouraging girls and students from diverse backgrounds to study computing: We offer the Digigirlz program and Careers Days through Australian Business and Community (ABCN)

Programs to expose diverse high school students to the high-tech world. Microsoft has also founded HerTechPath which is a program to inspire girls to consider a career in technology

- Supporting Mission Australia: Microsoft has been a proud partner of Mission Australia – one of the country's leading national not for profits in community services. Microsoft supported Mission Australia to embrace a cloud-transformed workplace to help drive mobility, flexibility and agility across the organisation and do it in a way that reduces costs while helping staff to access technology that supports the services that they deliver to clients. Moving to the cloud and leveraging Software as a Service solutions such as Office 365, Dynamics 365 and Microsoft Enterprise Mobility + Security (EMS), we helped Mission Australia users' ability to communicate and collaborate. The new environment is freeing their people up from administration hassles, so they can spend more time with clients to fully focus on what matters most - making a difference to people's lives
- Reconciliation Action Plan: Our RAP enables and empowers Aboriginal and Torres Strait Islander youth with 21st century skills required to thrive in the digital economy as well as fostering an internal culture that embraces diversity and pride in Australia's Aboriginal and Torres Strait Islander heritage. Microsoft Philanthropies is developing new national pilot programs to introduce digital initiatives designed to foster greater economic opportunity and job creation in indigenous communities across Australia. By partnering closely with indigenous leaders and communities in city fringes and regional areas, our goal is to learn more about indigenous challenges and how technology can help better contribute to local economic growth, with a plan to share our learnings more broadly. Examples include:
    - Our recent Microsoft TechSummit featured indigenous immersion by retelling Aboriginal Dreamtime stories through HoloLens by Indigital. Microsoft technology was used in this example to preserve indigenous language and culture. In addition, Microsoft Philanthropies supported the National Centre for Indigenous Excellence (NCIE) IDX program to bring 30 students from Grafton to participate in a one-week STEAM skills camp aimed to increase STEAM skills to vulnerable young indigenous people, through education and exposure to new learning experiences and career pathways.
    - Microsoft Philanthropies is also partnering with Indigital, University of Canberra and Shared Path to launch a 'Digital Custodians' program for indigenous youth in 2018. The program will support young people to develop solutions to pressing needs facing their own communities
    - Microsoft partnered with the South Australian Government to bring the Bridge to MassChallenge start up program back to Australia in 2017, following its success in 2016 with the Federal, Victorian and NSW Governments' support. Our sponsorship included providing scholarships for four indigenous start up founders to take part in the program.

We also recognise workplaces need to promote behaviours that encourage new ways of problem solving and reward diversity of thoughts. At Microsoft, we foster a culture of inclusive behaviours by:

- Ensuring that our technology is accessible to people with disabilities and driving innovation that opens further opportunities: Microsoft strives to ensure that its products are accessible to everyone, regardless of their abilities. We have ensured that our core platforms are usable by people with assistive technology like screen readers, speech recognition and alternative access devices that open up opportunities for people with disabilities in education and the workplace. We are also making it easier for organisations to create content that is accessible to all through Office365 and have created a dedicated customer support channel called the Disability Answer Desk.
- Driving Inclusive Innovation: A growing internal hacking culture focused on inclusivity have led to innovation that creates inclusive and empowering experiences including:
    - Seeing AI, an iPhone app that describes physical items like text, barcodes and human faces for people with low or no vision

    - Cities Unlocked that provides a 3D audio 'soundscape' of locations for a vision impaired person; and
    - Eye Control technology in Windows 10 that enables someone to control their computer using only their eyes, if they have lost mobility in other parts of their body
- **Sharing our learnings:** As we have been on a journey to create a more inclusive environment within Microsoft, we have sought to share our learnings. We have publicly shared what started as internal resources, including the Inclusive Design Toolkit; Accessibility 101 Training and our experiences of Inclusive Hiring
- **Providing a portfolio of diversity and inclusion training courses for all levels of employees and leaders around the world**: For example, Managing Inclusion™; Building an Inclusive Culture; Understanding Conscious and Unconscious Bias; CulturalDexterity™; and Consulting for Diversity Hiring developed specifically for our international HR and staffing teams focused on gender diversity.

There are a number of ways governments, industry and non-government organisations can work together to build a digital economy that is more inclusive and diverse. Based on our insights from developing and implementing both community and technology diversity and inclusion initiatives, we suggest the following approaches and measures be considered to support the Digital Economy Strategy:

- **Closer partnerships between governments and industry to examine where they can create the biggest impact.** This should involve a stronger consultation process with the community to analyse and understand the real needs of specific communities
- **Identification of champions from each community** to push for greater diversity and bring something different and authentic to Government and industry consultation processes around the digital economy. For example, indigenous leaders should be the champions for indigenous communities
- **The creation by Government of accessible digital services compliant with WCAG 2.0AA**
- **Governments should only purchase accessible products that comply with the Australian accessible ICT Procurement Standard AS EN 301 549** which ensures all products are accessible to people with vision impairments, mobility impairment and more
- **An examination of how the National Disability Insurance Scheme can be utilised to ensure that scheme participants with digital literacy skills.** Currently the NDIS provides payments and access to products and services however there is an opportunity to also provide individuals with an opportunity to learn digital skills
- **Government consultation processes for digital services that always include a representative from different communities.** For example, from disability groups, sector professions, indigenous and regional communities
- **Compulsory training courses for employees in diversity and inclusion for all levels**.

Artificial Intelligence (AI) – ethical and policy challenges

Artificial Intelligence is the most exciting and daunting aspect of the technological revolution that will have an enormous impact on the digital economy for many years to come. For this reason, we believe it is essential to tackle the workforce, ethical and policy challenges of AI in a holistic way to achieve good social and economic outcomes.

As Microsoft CEO Satya Nadella has outlined in his book *Hit Refresh*, we should think of AI as a set of technologies that perform perception, learning, reasoning, and decision making, aimed at endowing machines with the ability to solve the kinds of complex problems that in the past only people could handle. AI is likely to be central to economic growth in the decades ahead. To take one example, as Nadella explains, China recently announced its intention to become the global leader in AI research and implementation to strengthen its economy and create competitive advantages.

Microsoft is working to enable any company and any developer to build AI into their products to make them smarter and more efficient, and to enable entirely new capabilities, by delivering a comprehensive suite of AI services as a *platform* for others to build upon. Three key aspects of this platform are AI-infused database technology, a new set of "cognitive services," and our Azure Machine Learning services.

As we push AI science forward, it will be critical to address the influences of AI on people and society in the short and long term. There is an urgent need for focused studies, monitoring and analysis in this space now and into the future. The broad reach of AI's influences requires engagement with interdisciplinary groups, including computer scientists, social scientists, psychologists, economists, and lawyers.

There are a number of civil society groups running consultative processes on this to think about how we as an Australian society want AI to operate and to build a unified vision to address the challenges we face and to inform and create a series of principles. Government should engage and connect with those groups – although not try to replace them or control them.

Recognising exclusion in AI

For AI to fulfil its promise, the systems must be trustworthy and free from bias. At Microsoft, we have developed inclusive design tools and processes to recognise people with physical disabilities in our design process. As we've evolved our practices, we've expanded our design thinking to other areas of exclusion, including cognitive issues, learning style preferences and social bias.

Bias in AI will happen unless it is built from the start with inclusion in mind. The most critical step in creating inclusive AI is to recognise where and how exclusion bias infects the system. We believe there are at least five ways to identify this:

- Dataset bias – intelligence based on information that's within the individual's field of vision. This leads to data reduced to generalisations that ignore a variety of users
- Association bias – data making associations that perpetuate stereotypes in gender or ethnicity, for example language translation tools that make gender assumptions (for example, that pilots are male and flight attendants are female)
- Automation bias – AI predictive programs automating goals that override social and cultural considerations, for example beautification photo filters reinforcing a European notion of beauty like lighter skin tone
- Interaction bias – efforts to humanise AI might have unintentional toxic human bias, for example a chatbot is trained to use racist or sexist language
- Confirmation bias – AI algorithms interpret information in a way that confirms preconceptions and excludes results from people who made less popular choices.

By recognising and understanding these biases from the start, we can test the AI against other human considerations and build more inclusive experiences.

Building AI trust

Microsoft's approach to AI is based on three core principles: to build intelligence that augments human abilities and experience; to build trust directly into our technology; and the technology we build must be inclusive and respectful to everyone, serving humans across barriers of culture, race, nationality, economic status, age, gender, physical and mental ability, and more.

The most critical next step in our pursuit of AI is to agree on an ethical and empathetic framework for its design that is an approach for developing systems that specifies not just the technical requirements, but the ethical and empathetic ones too[2].

Everyone should be aware of how the technology works and what its rules are. The technology will know things about humans, but the humans must also know about how the technology sees and analyses the world.

To ensure AI preserves cultural commitments and empowers diversity, we need broader, deeper, and more diverse engagement of populations in the design of these systems. Peoples from every culture should have an opportunity to participate in shaping the values and purposes inherent in AI design. AI must guard against social and cultural biases, ensuring proper and representative research so that flawed heuristics do not perpetuate discrimination, either deliberately or inadvertently[3].

Conclusion

Australia needs to address our digital economy challenges and opportunities immediately if we are to remain internationally competitive. Global comparison studies show we continue to rank very low on business agility and workforce digital and technology skills. This clearly has a direct impact on our preparedness to exploit digital transformation which will hold back our economic growth. It is also alarming that other countries are moving much faster to improve the digital competency of their workforces while Australia lags behind. Put simply, we cannot keep hoping that our future prosperity will continue on as it has in the past.

For this reason, we believe it is essential to make digital skills development a top priority and one that is integrated across all key stages of a person's education, work and personal life. Microsoft has for many years worked hard to promote the digital economy in Australia and around the world. We believe strongly in the power of technology to unlock potential – be that of students, employees, customers, partners, businesses or diverse communities – and drive meaningful contributions within our society.

In summary our five key recommendations centre on:

- Government as a leader on digital transformation – participating as an exemplar in the adoption of digital technology and transformative work practices
- Skills development – ensuring all Australians have the right skills to thrive as digital transformation continues to impact the workplace
- Support for start-ups and entrepreneurs – Government and industry needs to provide the necessary frameworks and support for start-ups to take full advantage of the digital economy
- Making sure no-one is left behind – Government and industry must ensure technology adoption embraces diversity and inclusion
- Artificial Intelligence – While embracing AI Government must consider the ethical and policy challenges in a holistic way to achieve good social and economic outcomes.

From our experience, getting people to take small steps – applying behavioural nudges to move their digital capabilities and move them further along the digital change curve is essential. We need to persuade more Australians to have a go by offering accessible, practical and safe steps forward so they can see that digital skills will not only help them protect their livelihoods, they will help them progress in their careers and lives. This requires an integrated approach so that a culture of digital training and education is embedded from

[2] Nadella, S 2017, *Hit Refresh*, HarperCollins Publisher, New York, pg 204
[3] Nadella, S 2017, *Hit Refresh*, HarperCollins Publisher, New York, pg 205

school, throughout employment and beyond. As Microsoft CEO Satya Nadella explains, technological change is an opportunity: "Rather than thinking in terms of human vs. machine, we want to focus on how human gifts such as creativity, empathy, emotion, physicality and insight can be mixed with powerful [artificial intelligence] computation…to help move society forward."[4]

[4] Nadella, Satya. *Hit Refresh: the Quest to Rediscover Microsoft's Soul and Imagine a Better Future for Everyone*. HarperBusiness, an Imprint of HarperCollinsPublishers, 2017.