

Australia's Digital Economy Strategy

Submission to the Department of Industry, Innovation and Science

23 October 2017

Introduction

AlphaBeta Advisors welcomes the opportunity to provide input to the Australian Government's consultation paper on how to develop a national Digital Economy Strategy. As a strategy consultancy with offices in Sydney and Singapore, our firm uses big data research and econometric analysis to understand how our clients – from government agencies to private-sector companies and not-for-profits – can take advantage of major global macroeconomic trends, including the growth of the digital economy. Part of our work comprises analysis on how automation and digitisation will affect the future employment opportunities and national productivity in Australia.

Australia needs a thriving digital economy to be globally competitive and fully exploit its economic potential. We share the Department of Industry's view that governments, the private sector and the community must work together to unlock new sources of growth within the digital economy to sustain Australia into the future. However, a significant mindset shift is needed to achieve this goal.

This is why AlphaBeta would like to urge the Australian Government to increase its efforts to:

1. **Embrace automation and the digital economy.** To harness a productivity gain of up to \$2.2 trillion for the Australian economy by 2030, the Government should work with Industry Growth Centres to launch a series of **Future Digital Industry Workshops** showing businesses how to use the power of innovative digital and automation technology to increase competitiveness.

The goal is to at least double the share of Australian listed companies with sustained technology investments from currently 9 per cent to around 20 per cent, in line with leading automation nations such as the US.

2. **Facilitate worker transition.** Each year 190,000 Australians undergo a 'workforce transition', in which they face a period of uncertainty and financial instability while moving from losing one job to finding another.¹ To significantly lower the cost of these transitions to the Australian economy, estimated to be \$6 billion per year, the Government should
 - create an accessible **Online Skills Transferability Tool** that links the skills and qualifications of workers in transition with the skills demand in growth industries. Big data technology could enable such a tool to track employment trends in real time, allowing policymakers to identify and develop targeted skills training and re-training strategies.
 - establish a **nationwide Industry Structural Adjustment Program** to help workers displaced by technological progress acquire the necessary skills to find new employment. Such a program could be modelled on an existing initiative for the automotive industry, which enabled 97 per cent of laid-off workers to successfully transition into a new role.

The goal is to substantially improve Australia's poor record of supporting workers through structural change – nearly one in 10 unskilled male workers who lost their job over the past 25 years never found another.

¹ Workers are considered in transition if they lost their job due to being laid off, no work being available, retrenchment, redundancy, employer going out of business or being dismissed.

3. **Focus education on future jobs.** To ensure all Australian students meet the demands of workplaces in the digital economy (60 per cent of students currently train for occupations at risk of being radically transformed by automation and digitisation), the Government should use insights from real-time data on skills demand and jobs growth to **sharpen the Australian Curriculum**, including the **mandatory Digital Technologies Curriculum** from primary school. The goal is to enable education providers to teach students the right skills, as future workers will likely spend up to double as much time per week using their problem-solving skills, science and maths, and entrepreneurial mindset; almost 60 per cent will have to know how to configure and use digital systems or be able to build digital technology in coming years.

Our Recommendations

1. **Embrace automation and the digital economy**

Goal:

Harness a productivity gain of up to \$2.2 trillion for the Australian economy by 2030 and at least double the automation uptake among listed Australian companies from currently 9 per cent to around 20 per cent, in line with leading automation nations such as the US.

Recommended action:

The Government should work with Industry Growth Centres to launch a series of Future Digital Industry Workshops showing businesses how to use the power of innovative digital and automation technology to increase competitiveness. This should help lift the share of Australian listed companies with sustained technology investments from currently 9 per cent to around 20 per cent, in line with leading automation nations such as the US.

- The current public debate is focusing a lot on the potential job losses caused by robotics and other digitisation technologies. However, it would make good economic sense to focus more strongly on the opportunities presented by the growing use of machines and digital technology. **Australia's economy has a lot to gain if governments and industry work hand in hand to set the right policy framework.**
- AlphaBeta research shows that since the start of the millennium machines have already replaced two hours per week of our most repetitive manual job tasks.² By 2030, they will likely replace another two hours of dirty, dull or dangerous tasks per week.
- This shift of labour from human workers to machines will inevitably cause frictions. But our analysis of past workplace trends suggests that a large majority of Australian workers (71 per cent) will simply be doing their existing jobs differently, rather than change or lose jobs, as a result of technology.
- These changes are not unprecedented. The rate of automation today is no higher than past waves of technological progress, and history suggests there is no reason for automation to spark widespread and persistent unemployment. Over centuries, machines have progressively

² AlphaBeta (2017), *The Automation Advantage*. Available at: <http://www.alphabeta.com/wp-content/uploads/2017/08/The-Automation-Advantage.pdf>

replaced labour in agriculture, manufacturing, administration and professional services, but ultimately led to increased prosperity, productivity and employment.

- The same phenomenon is happening today: the use of machines is causing strenuous physical jobs and routine administrative jobs to disappear. On the flipside, new job opportunities are emerging in community, personal and business services, and other specialised professions that rely on uniquely human skills such as thinking creatively and being able to understand other people's emotions.
- If policymakers and business leaders get it right, **automation and digitisation could significantly boost Australia's productivity and national income – potentially adding up to 2.2 trillion Australian dollars in value to our economy by 2030**, according to AlphaBeta research.
- To unlock these gains, the following conditions need to be fulfilled:
 - **Australia must encourage more firms to invest in automation and digital technology.** Currently, Australian companies are lagging global peers in embracing automation. AlphaBeta research shows that only 9 per cent of Australia's listed companies are making *sustained investments in automation*, compared with more than 20 per cent in the United States and nearly 14 per cent in leading automation nations globally.

Australian firms are also lagging Asian peers in producing *digital innovation*. For example, the number of patents granted in 2015 for digital products in Australia (around 77 per 1 million residents), is just a third of the number of digital patents granted in South Korea (around 214 per 1 million residents) and half of that in Japan (137 per 1 million residents) in the same year. This low rate of investment in automation and digital technology acts as a handbrake on our productivity growth that will ultimately reduce our national income.
 - **The Government should consider launching a nationwide series of Future Digital Industry Workshops for business leaders**, in cooperation with Industry Growth Centres, as a cost-effective way to accelerate the corporate uptake of automation and digital technology. The focus could be on helping companies in manufacturing, Australia's most innovative sector, to increase their understanding and adoption of technology associated with the Fourth Industrial Revolution, also known as Industry 4.0.

The Queensland Government, as well as countries abroad such as New Zealand and the United Kingdom, have already invested in Industry 4.0 workshops to inform and encourage local manufacturing firms to advance their production processes.
 - **Australia requires a strong policy framework to ensure workers at risk of being displaced are redeployed.** Government should launch a nationwide Structural Adjustment Program to help workers train and retrain for jobs in the growth industries of the digital economy (see Recommendation 2 for details).
 - **Australia should sharpen its education system to ensure young people are prepared for the big job market changes ahead.** Government should better assist education providers in aligning their curricula with industry needs, so future workers can acquire the right skills to succeed in the digital economy (see Recommendation 3 for details).

2. Facilitate worker transition

Goal:

To significantly lower the current estimated cost of \$6 billion per year caused by workplace transitions and provide targeted assistance to ensure all workers displaced by technological progress find new employment.

Recommended action:

The Government should create an accessible Online Skills Transferability Tool that links the skills and qualifications of workers in transition with the skills demand in growth industries. Big data analytics could help track employment trends in real time, allowing policymakers to identify and develop targeted skills training and re-training strategies.

The Government should also establish a nationwide Industry Structural Adjustment Program, modelled on existing Australian assistance for the automotive industry, to help workers displaced by technological progress acquire the necessary skills to find new employment.

- AlphaBeta research shows that each year, around 190,000 Australians undergo a ‘workforce transition’ – the period between losing one job and trying to find another.³
- Not all workforce transitions are challenging, but many of them are: nearly half of all workers in transition spend some time in unemployment and nearly one-third drop entirely out of the labour force for some time. One in 10 workers in transition suffer a pay cut, while 17 per cent of them rely on some form of welfare payment/public assistance. **Only one in 10 of these workers take part in retraining or other education.** 18 per cent end up changing occupations.⁴
- Together, **workers in transition cost the Australian economy an estimated \$6 billion each year**, according to AlphaBeta research. Much of this cost is caused by lost wages from time between jobs, the wage difference between old and new employment, the depreciation of qualifications and the drawdown on public assistance, including unemployment benefits.⁵
- Some areas of the Australian economy are disproportionately affected by such structural shifts. Many jobs in manufacturing and administration are disappearing due to growing machine use. Yet new jobs are emerging in professional and health services, and in the technology sector.
- However, it can be challenging particularly for older and lower skilled workers to find new employment after being laid off due to structural change. Their chances of finding a new job depend on the overall economic climate and their individual skills and mobility. A lack of re-training opportunities could result in a skills mismatch and hinder laid-off workers from being hired in expanding industries with high labour demand.
- **Australia has a poor record of supporting workers through workforce change.** Over the past 25 years, nearly one in 10 unskilled male workers in Australia lost their job and never found another, according to AlphaBeta research in partnership with the Foundation for Young Australians (FYA).⁶ Today, more than one in four working-age unskilled men are neither in work

³ Unpublished research. Workers are considered in transition if they lost their job due to being laid off, no work being available, retrenchment, redundancy, employer going out of business or being dismissed.

⁴ Unpublished AlphaBeta research.

⁵ Unpublished AlphaBeta research.

⁶ FYA (2015), *The New Work Order*. Available at: <https://www.fya.org.au/wp-content/uploads/2015/08/fya-future-of-work-report-final-lr.pdf>

nor looking for a job. Nearly one in three young people in Australia are either unemployed or underemployed.

- **The Government should use modern real-time labour market data analytics to create an accessible 'Online Skills Transferability Tool'** that links the skills and qualifications of workers in transition with the skills demand in growth industries. Such a web-based tool would allow policymakers to identify and develop targeted skills training and re-training and improve the success rate of transitioning workers from disrupted sectors into growth industries.
- Research shows that the skill sets of many jobs are 'portable' to other jobs, which should be beneficial for any efforts to help workers in transition find new employment in growth sectors. In fact, on average, when a person trains or works in one job, they acquire skills for 13 other jobs.⁷ This is because, for many jobs, employers demand very similar skills. **Using big-data analysis to understand potential skills overlaps between occupations could help policymakers, education providers and employers provide targeted training and re-training opportunities.**

3. Focus education on future jobs

Goal:

Ensure all Australian students have the right skills to be employable in the digital economy, as opposed to 60 per cent of students who currently train for occupations that will be radically affected by automation and digitisation over the next 10 to 15 years.

Recommended action:

To the Government should use insights from real-time data on skills demand and jobs growth to sharpen the Australian Curriculum, including the mandatory Digital Technologies Curriculum from primary school, to reflect latest research showing future workers will likely spend up to double as much time per week using their problem-solving skills, science and maths, and entrepreneurial mindset; almost 60 per cent will have to know how to configure and use digital systems or be able to build digital technology in coming years.

- An entire generation of young Australians is at risk of learning skills that are useless for the future world of work. AlphaBeta research in partnership with FYA shows that **almost 60 per cent of Australian students are currently getting educated for jobs that will be radically affected by automation and digitisation** over the next 10 to 15 years.⁸
- This threatens the ongoing promise of safe jobs and decent pay in Australia. Young Australians are facing a future where pay for the skilled will rise, while unskilled workers will be forced to compete with low-cost automation at home and foreign workers abroad. Several measures indicate a trend towards greater income inequality over the past few decades.⁹ Income inequality has increased, even as a long resources boom has led to very strong growth in incomes across the board, including the bottom decile of households.¹⁰

⁷ FYA (2015), *The New Work Order*.

⁸ FYA (2015), *The New Work Order*.

⁹ ABC News, 29 August 2017, Fact check: Does the data show that income inequality has fallen? Available at: <http://www.abc.net.au/news/factcheck/2017-08-16/fact-check-income-inequality-has-it-improved/8804976>

¹⁰ Treasury Research Institute (2013), *Income Inequality in Australia*. Economic Roundup Issue 2/2013. Available at: <https://treasury.gov.au/publication/economic-roundup-issue-2-2013-2/economic-roundup-issue-2-2013/income-inequality-in-australia/>

- Australia is also facing a severe shortage of workers in critical areas of the digital economy. There are signs that the need for additional cyber security talent in Australia – estimated to be around 11,000 over the next decade just to meet business-as-usual demand – is among the worst in the world.¹¹ Many firms are struggling to find job-ready cyber security workers despite offering high wage premiums.
- The Government can take active steps to ensure future worker generations are prepared for careers in the digital economy:

- **Australia should use new sources of real-time labour market data on jobs growth and skills demand to help education providers deliver the right training.** AlphaBeta research in partnership with FYA, based on a big data analysis of millions of job ads, signals that by 2030 workers will spend on average 30 per cent more time per week learning on the job, spend double the time solving problems, spend 41 per cent more time on critical thinking and judgment, and 77 per cent more time using science and maths.¹² They will also likely use verbal communication and interpersonal skills 17 per cent more often per week and develop a stronger entrepreneurial mindset.

Education and training providers need to be prepared to navigate this changing world of work. There is an urgent need for investment in a national enterprise skills and careers education strategy that begins in primary school, is delivered in a way that resonates with young people, and provides accurate information about the skills that will be important in the future. The focus should be teaching fundamental skills that allow future workers to easily switch from one occupation to another in the digital economy.

- **The Government should use big data analytics to create a new, robust classification of “digital literacy” as a basis for an overhaul of Australia’s mandatory digital technologies curriculum from primary school.** There is still a lack of clarity around the concept of digital literacy and the skills future students need to succeed in the digital economy. AlphaBeta research in partnership with FYA, based on big data analysis, shows that Australia’s workforce needs to acquire better digital skills: almost 60 per cent will have to know how to configure and use digital systems or be able to build digital technology in coming years.¹³

Countries such as Japan, Canada and Singapore can serve as role models for education curricula that place enterprise skills and problem solving at the heart of learning. Japan, for example, reduced content load by approximately 30 per cent and increased time for ‘integrated learning’, where students engage in cross-curricular, problem solving projects.¹⁴

- To at least double the number of cyber security professionals in Australia, **the Government should – in close consultation with the Australian Cyber Security Growth Network – focus on growing existing cyber security education and training institutions** into dynamic, enterprising and export-oriented players.¹⁵ This will help the country

¹¹ ACSGN (2017), *Sector Competitiveness Plan*. Available at: <https://www.acsgn.com/cyber-security-sector-competitiveness-plan/>

¹² FYA (2017), *The New Work Smarts*. Available at: https://www.fya.org.au/wp-content/uploads/2017/07/FYA_TheNewWorkSmarts_July2017.pdf

¹³ FYA (2015), *The New Work Order*.

¹⁴ More case study examples can be found in FYA (2015), *The New Work Order*.

¹⁵ See www.acsgn.com for details on the mandate and work of the Australian Cyber Security Growth Network.

realise its potential to become a leading global provider of cyber security education and training.

- **The Government should consider reallocating funds from existing school-based grant programs to increase opportunities for students to acquire industry-relevant skills for work in the digital age.** The innovative, school-based “Advanced Manufacturing Industry School Pathways Program” in New South Wales, Western Australia and South Australia could serve as a model that could be more widely adopted across Australia.¹⁶ It aims at teaching more students relevant skills in Science, Technology, Engineering, and Mathematics (STEM) and fostering careers in the growing Australian defence manufacturing industry. Schools can apply for program grants to include more STEM subjects in their curricula and to set up partnerships with companies to offer students internships and weeklong work experiences.
- **Australia should also foster partnerships between training institutions and industry** to improve the job-readiness of graduates, particularly in areas of the digital economy such as cyber security. These learning experiences are best suited to developing enterprising and career management skills that will be most in demand and most highly portable in the future of work, and instil in young people the enthusiasm for ongoing learning that will be critical for their future success.

¹⁶ See program webpages for further details: <http://www.meprogram.com.au/> (NSW), <http://dlb.sa.edu.au/atmoodle/> (SA) and <http://www.det.wa.edu.au/curriculum-support/schoolpathways/detcms/portal/> (WA).