



Australia's National Innovation System

AIIA response to the Senate Parliamentary inquiry

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About AIIA

The Australian Information Industry Association (AIIA) is the peak national body representing Australia's information technology and communications (ICT) industry. Since establishing 35 years ago, the AIIA has pursued activities aimed to stimulate and grow the ICT industry, to create a favourable business environment for our members and to contribute to the economic imperatives of our nation. *Our goal is to "create a world class information, communications and technology industry delivering productivity, innovation and leadership for Australia".*

We represent over 400 member organisations nationally including hardware, software, telecommunications, ICT service and professional services companies. Our membership includes global brands such as Apple, EMC, Google, HP, IBM, Intel, Microsoft, PWC, Deloitte, and Oracle; international companies including Telstra; national companies including Data#3, SMS Management and Technology, Technology One and Oakton Limited; and a large number of ICT SME's.

This submission

The AIIA appreciates the opportunity to provide this submission to the inquiry into Australia's Innovation System being conducted by the Senate Economic References Committee. We support the objective of the review which is essentially to investigate and address the challenges to Australian industries and jobs posed by increasing global competition in innovation, science, engineering, research and education.

This submission provides the Committee with our views on:

- The important role that innovation plays in driving productivity, growth and competitiveness.
- The key success factors - pillars - for an effective innovation system, and current impediments to these in Australia.
- Critical actions for industry, government and the research sector in Australia required to improve the effectiveness of Australia's innovation system.



Innovation for long term economic growth

The Australian economy is entering a critical phase, with a number of 'disruptive' trends and pressures which provide both opportunities and risks for Australian business. The resources boom has had a significant impact on the structure of the Australian economy. The rapid increase in global demand for commodities, and the corresponding strong growth in commodity prices, placed the Australian resources sector in an enviable position. Growth in exports, both in volume and value, led to historically high terms of trade and exchange rate.

A critical outcome of the resources boom has been the impact on productivity. Australia's productivity growth - the envy of the developed world in the 1990s - has slowed dramatically in the last decade (primarily due to significant falls in mining and agriculture productivity). While increasing terms of trade has, so far, sustained incomes, despite slower productivity growth, this is not sustainable. In the long run, productivity growth is essential to Australia's prosperity. These underlying structural challenges are emphasized when considering these key trends:

- Between 2005 and 2012, 58 per cent of our income growth was the result of 'boom' factors, rather than productivity growth.
- 35 per cent of income growth has come from resources sector, as has 99 per cent of productivity decline.
- Productivity declined 0.7 per cent annually between 2005 and 2012, compared with growth of 2.4 per cent between 1993 and 1999.¹

Notwithstanding the need for a renewed focus on productivity, the economic and demographic landscape is different and rapidly advancing technology is driving profound change at local and international levels and across all sectors. Technology is transforming business operations and business models and disrupting traditional value and supply chains globally. With the global distribution of supply and value chains, products, services and labour are all tradeable.

To sustain the level of prosperity Australia has enjoyed (and expects) productivity growth is imperative. However, this is only possible if we remain, indeed improve our global competitiveness. In the current global digital economy this translates to both the ability to participate and effectively compete in the global market as well as the ability to compete locally to retain skilled employees and domestic customers.

While greater investment in 'inputs' can provide shorter term growth in national income over the longer term innovation is the primary driver of sustained higher economic growth and living standards. This critical relationship was emphasised by the Productivity Commission:

A little over half of the decline in productivity growth below long-term average rates this decade has arisen from developments in agriculture and mining – notably drought and the export boom. There are good reasons for expecting productivity growth in these sectors to improve, but sustained aggregate productivity growth recovery will not be automatic, and attaining above-average growth will require improved performance in several key areas.

Innovation and diffusion of new and better production methods, and the introduction of new goods and services, are the core drivers of productivity growth – getting more, and more highly valued, outputs from any level of inputs.²

Across the economy, innovation encompasses a broad range of different changes:

- New, or enhanced products or services,
- New processes which improve efficiency,

¹ McKinsey Global Institute (2012), Beyond the Boom: Australia's productivity imperative, August.

² Productivity Commission (2008), Annual Report 2007-08.



- Enabling innovation, which improves networks or linkages across the economy (the Internet being the best example).

Innovation can be incremental - achieved through gradual change - or it can be disruptive, where it leads to a fundamental change in a particular market or sector.

The benefits of innovation encompass direct benefits to innovative firms and consumers and social benefits through knowledge spill overs. Spill overs are benefits which are not directly captured by the innovator. They arise where ideas and concepts from innovation are mimicked or adapted in further innovation. Spill overs from innovation provide a multiplier effect across the economy, and are the primarily rationale for government funding support for research, particularly basic research.

In the case of digital innovation and entrepreneurship, evidence shows a direct correlation to increased business opportunities, economic growth and job creation. With the right support it is estimated that *"the Australian tech startup sector has the potential to contribute \$109 billion or 4% of GDP to the Australian economy and 540,000 jobs by 2033 with a concerted effort from entrepreneurs, educators, the government and corporate Australian"*.³ Recent analysis shows that entrepreneurs supplied 57% of all jobs in the EU in 2012⁴ and 75% in China⁵ while in the US start-ups and companies less than five years old account for nearly all net job creation in the last three decades⁶.

In his recent speech to the Centre for Independent Studies⁷, Parliamentary Secretary to the Minister for Communications, Paul Fletcher specifically highlighted the role of startups in job creation and further, the disproportionate role of the high tech sector in generating startup companies. Siting the report from America's Kauffman Foundation, he reported that new business formation was 23% more likely in the high tech sector of the US economy than in the private sector as a whole. According to Fletcher the report also found that new and young firms in the high-tech sector are more robust job-creators than such firms in the broader economy.⁸

While Australia's position in the 2014 Global Innovation Index⁹ has marginally improved on previous years, we still rank only 17th overall, still well behind countries such as Switzerland, the UK, Finland, the US, Singapore and Canada.

In a world where our population remains reasonably stable whilst the number of people in productive employment is reducing and the cost of our ageing population increasing, innovation is imperative to future growth and productivity improvement. The Government knows this - and articulates that link explicitly. How they are responding is much less clear.

³ PwC Consulting, (2013) The Startup economy. How to support tech starts and accelerate Australian innovation.

⁴ Ecorys, EU SMEs in 2012: at the crossroads. Annual report on small and medium sized enterprises in the EU, 2011/12 p.15

⁵ "China Country Profile: small and medium sized enterprise," Ministry of Commerce Peoples Republic of China website, 3 July 2013

⁶ D Stangler and P Kedrosky, Neutralism and Entrepreneurship: The Structural Dynamics of Startups, Young Firms and Job Creation. 2010.p 13.

⁷ <http://www.paulfletcher.com.au/speeches/other-speeches/item/1101-speech-to-the-centre-for-independent-studies-our-national-competitiveness-and-where-the-digital-economy-fits-in.html>

⁸ Ibid.

⁹ <http://www.globalinnovationindex.org/content.aspx?page=gii-home>



Pillars of an effective innovation system

Despite the critical role innovation plays in powering productivity and growth, Australia's innovation system is not structured, or supported, to ensure that it is as effective as it can be.

While some innovations are simply serendipitous, the level of investment lead economies such as the US, UK, South Korea, Singapore and the European Union are directing to innovation, entrepreneurial capability development and high tech start-ups, suggests that serendipity is not a sure bet. To the contrary, there is a deliberate and intense focus on developing a robust sustainable ecosystem in which innovation thrives and from which productivity and economic benefits can be derived.

Of course, innovation is not an end in itself. It is the means to achieve higher order outcomes - the growth, productivity and competitiveness that underpins national prosperity. It is because innovation is so critical to achieving these outcomes that a more informed and systematic approach to building innovation is necessary.

According however, to the report *Entrepreneurial Ecosystems around the Globe and Early-Stage Company Growth Dynamics*, released at the Davos conference earlier this year, the conditions necessary to foster a robust start-up ecosystem are, in Australia, below par.¹⁰ The lack of effective links between start-ups and larger companies to connect start-ups with global value and supply chains¹¹, limited access to capital, unsupportive tax arrangements, overly burdensome government regulations and poor cultural support for early stage companies are all identified as impediments.

The need therefore for a more systematic, joined-up approach to the innovation system is crucial and in AIIA's view needs to encompass:

- Infrastructure and Knowledge
- Collaboration
- Education and Skills
- Funding
- Regulation and Policy
- Culture

Critically these do not stand alone. The success of the innovation depends on their interconnection.

Infrastructure and Knowledge

An effective innovation system must be underpinned by investment in research infrastructure - basic as well as applied and experimental research. While the latter is typically undertaken by industry, nearly 80% of 'basic' research done in Australia is through Australia's public research capacity.¹² 'Basic' research encompasses broad economic, social, environmental and cultural benefits derived by Australia as a whole. It generally requires long lead times, is characterised by delayed returns and uncontrollable spill overs and has no clear path for commercialisation. For these reasons it is historically been the focus on of public rather than private investment.

Recent funding cuts to two of Australia's premier public research institutions - CSIRO and NICTA, signals therefore, a potentially serious erosion of Australia's future research infrastructure capability.

Funding cuts and policies premised on the assumption that the market will drive basic, core research are therefore, flawed. There are no economies in the world where such

10 <http://reports.weforum.org/entrepreneurial-ecosystems-around-the-globe-and-early-stage-company-growth-dynamics/wp-content/blogs.dir/34/mp/files/pages/files/nme-entrepreneurship-report-jan-8-2014.pdf>

11 Ibid.

12 Powering ideas. An Innovation Agenda for the 21st Century. Australian Government, 2009



fundamental, pure research is undertaken by commercial entities. While companies will pay for research to solve their own problems, the cost of the underlying research infrastructure - the research platforms, skills (PhD students), industry cluster centres, pilot trials of new research, and associated activities that are integral to R&D, must be funded on a sustainable basis – typically by government over the long term. Only governments have the incentive and capacity to invest in core research that benefits the economy as a whole.

In the case of NICTA, its unique feature as a publically funded research model is its role to explicitly connect leading university researchers to industry/business - basic research 'discovered' by NICTA is applied to real business problems and in the process, the next generation of skilled ICT researchers embedded across industry, typically multiple industry sectors. With 22 university partners and some 300 PhD students, the NICTA model has fostered the integral role of ICT in transforming individual companies and ultimately the economy overall. NICTA's research is being translated into tangible economic benefits of up to \$2 billion per annum for a wide range of industries such as mining, logistics and transport, finance, health and government.¹³

As evidenced by the success of NICTA and confirmed by the Government itself (in its Policy for E-Government and the Digital Economy and as articulated recently by Paul Fletcher)¹⁴ the role of technology in Australia's innovation system is increasingly critical. Technology is more than an input to the rapid change we are experiencing. In disrupting business models and driving advancements and innovation in products and services, technology and digitisation are core to future innovation.

Enrico Moretti in his book, *The New Geography of Jobs*, particularly emphasises the importance of technology in enabling innovation and driving resultant economic outcomes. In his view the challenges of the modern global economy can be managed by companies so long as they continue to move up the technological food chain. He makes the point that the multiplier effect of innovative industries is far greater than the multiplier effect of traditional manufacturing. Moretti calculates that the 12,000 Apple workers employed in Cupertino indirectly support another 60,000 jobs in the local metropolitan area *outside* the tech sector - both skilled (24,000) and unskilled (36,000) jobs.¹⁵

Technology and digitisation have contributed to building entrepreneurial capabilities by facilitating easier access to knowledge for innovators; expanding markets for entrepreneurs; facilitating invention; and enabling linkages between stakeholders across domestic and global innovation systems. Although implicit in most of what we do, Australia's innovation system of the future must explicitly commit to leveraging high end and emerging new technology to underpin future innovation capability.

Collaboration

International evidence confirms that collaboration is key to innovation performance and outcomes and that research and innovation are most effective when collaboration is maximised.^{16 17 18} This includes collaboration between universities, research institutions and businesses; collaboration

¹³ Deloitte Access Economics, National ICT Australia: Benefits from NICTA's research to the Australian economy, 15 June 2012

¹⁴ See Paul Fletcher's Speech of 22 July 2014 ¹⁴ <http://www.paulfletcher.com.au/speeches/other-speeches/item/1101-speech-to-the-centre-for-independent-studies-our-national-competitiveness-and-where-the-digital-economy-fits-in.html> and the Coalition's Policy for e-government and the Digital economy. <http://lpaweb-static.s3.amazonaws.com/Coalition%27s%20Policy%20for%20E-Government%20and%20the%20Digital%20Economy.pdf>

¹⁵ Moretti, Enrico 2012, *The New Geography of Jobs*.

¹⁶ Public-Private partnerships for Research and Innovation: An Evaluation of the Australian Experience, ,OECD, 2004

¹⁷ Meetings Around the World: The Impact of Collaboration on Business Performance. Frost and Sullivan, 2008.

¹⁸ Powering ideas. An Innovation Agenda for the 21st Century. Australian Government, 2009



between large companies and smaller businesses; government, research and business collaboration; and more broadly connections to global research and business networks.

Collaboration increases the capacity to create and absorb new knowledge, develop and access new skills, reduce costs through eliminating duplication, driving economies of scale and democratising access to potentially expensive and scarce resources. It spreads cost and risk and in the case of research organisation and industry collaboration enables 'good ideas' to be applied and commercialised. Engagement in international collaboration and global value chains builds world standard competitive capability.

Spill over benefits from knowledge diffusion are a critical component of the overall value of innovation and core to this is an underlying, effective collaboration framework.

While at one level Australia simply lacks an appropriate supporting collaborative infrastructure, at another, incentive arrangements for some publically funded research organisations actively mitigates against collaboration.

A system that incentivises universities to focus on research publications rather than outcomes, is not conducive to effective research/industry collaboration. Combined with practices that lock intellectual property in universities, current arrangements undermine effective collaboration and the potential commercial benefits that could be delivered to all parties.

The lack of well-structured or permanent information sources available to participants in the innovation system combined with the absence of innovation precincts - physical hubs that provide a focal point to bring together the relationships and resources they need to innovate - are symptomatic of the bigger issue if an innovation system that lacks formal and effective collaboration frameworks.¹⁹

Education and Skills

Investment in education, skills development and entrepreneurial capability are critical to building innovation capability - *"The development of genuinely novel innovations typically relies on technical mastery in a complex area, especially STEM fields"*²⁰.

The nature of the global digital economy means that Australian businesses and individuals now participate in widely dispersed markets and value chains. As a result and to be competitive, Australia must have both the right skills as well as the depth of quality of capability to participate.

It also means that the nature of the skills required to compete are changing. The computerisation impacting all industries means that the demand for ICT skills is not limited to the ICT industry but required across most industry sectors - particularly if they aspire to be innovative.

Despite increased industry demand for specific ICT skills, the take-up of ICT related tertiary course over the last decade has virtually halved.²¹ While females once made up 25% of students commencing a technology degree, this is now closer to 10%²² and with the number of women in ICT occupations declining in 2012 to less than 20% of the ICT workforce²³, the current outlook in terms of women in ICT is pessimistic, presenting a challenge for both industry and government.

Similar trends are occurring in the science, engineering and math disciplines.

¹⁹ <http://www.microsoft.com/enterprise/en-au/business-leaders/joined-up-innovation/default.aspx#fbid=XUZGQJKwVP9>

²⁰ Ibid

²¹ ICT job numbers from the ACS Statistical Compendium, 2012 (see www.acs.org.au). ICT applications from the DIISRTE Higher Education reports.

²² Australian Financial Review, 3 February 2014

²³ Australian Computer Society, (2014) *2013 Statistical Compendium*



Notwithstanding that Australia's education levels are recognised as comparatively high internationally, the declining number of students graduating from ICT, science, engineering and math degrees is, in a progressively knowledge-rich and complex world, a competitive *disadvantage*.

In an intensely global competitive market where almost everything is tradeable Australia must also retain the quality skills and capabilities it develops. As labour becomes increasingly mobile, with the best people chasing the best jobs wherever they are in the world, Australia needs to ensure it fosters the right conditions and incentives to retain the best and brightest to drive innovation and success of our home grown businesses. Already hindered by the short supply of IT professionals, and noting the lead time to build indigenous ICT capability, Australia also needs to consider shorter term skill development and retention options.

Entrepreneurialism drives innovation and creates jobs. Entrepreneurial businesses account for over half of all employment in most G20 countries.²⁴ They spur innovation through the development of new technologies, products, services, processes and business models. They spread new ideas, inspire better ways to do things, are prepared to take risks, solve problems and are motivated and skilled to drive change. Fostering entrepreneurship - a skill that can be learned - is also key to an effective innovation system.

Funding

Entrepreneurs need an environment that is conducive to investment in activities that drive new ventures, new products and services and new jobs.

Australia has one of the lowest rates of venture capital investment in the developed world. According to the 2013-14 World Economic Forum Global Competitiveness Report Australia ranks 19th in the availability of venture capital - well behind the US, Singapore, Malaysia, Norway, Sweden, Israel and China.²⁵

On a per capita basis venture capital investments in start-ups in Australia is currently US\$4.7 per capita per annum. This compares to US\$170 in Israel, US\$85 in the United States, US\$20 in South Korea, US\$15 in the UK and US\$5 in New Zealand.²⁶

In 2013 sources for new venture capital reduced by \$2.4 billion, or 77%.²⁷

With limited venture capital and private equity funding opportunities many Australian start-ups and entrepreneurs struggle because they cannot access essential financial support. Lack of access to 'affordable' capital - at reasonable rates and on reasonable terms - is one of the most significant market failures in the Australian start-up ecosystem.

To support an effective innovation ecosystem, Australia needs to develop more innovative funding platforms. These include crowdfunding, microfinance, targeted venture capital funds and incentives for private sector investors to focus more on innovative and entrepreneurial businesses.

Culture

Innovators and entrepreneurs are a nation's job creators. With increasingly rapid advances in technology, they are also the 'creators' of the jobs and careers of the future - a point borne out by Michael Mandel's recent analysis, Jobs in the Australian App Economy²⁸.

²⁴ The Power of Three. Together, governments, entrepreneurs and corporations can spur growth across the G20. EY. 2013

²⁵ http://www3.weforum.org/docs/WEF_GlobalCompetitivenessReport_2013-14.pdf

²⁶ Referenced in Crossroads. An action plan to develop a vibrant tech start up ecosystem in Australia, Startup AUS, April 2014. P48

²⁷ Reported Computer Daily News, 14 February 2014

²⁸ Mandel, M. 2014. Jobs in the Australian App Economy. Progressive Policy Institute.



Notwithstanding that repeat entrepreneurs who have failed once before have been shown to have a higher chance of success than those trying for the first time²⁹, Australia's tolerance for business risk and failure is low. The low acceptance of business failures means potential innovators are often reluctant to launch new ventures for fear of harming their reputation.³⁰ It is also reflected in the reluctance of talented people to transfer from the tertiary education sector to private sector organisations - the perception that it is a failure to go from research in university to business.³¹

A characteristic of countries with a mature innovation ecosystem is that they typically have a more established history and culture of entrepreneurship.³² This must be an explicit goal of Australia's innovation ecosystem.

The role of Government in taking a leadership position in driving innovation, particularly in the delivery of services is also important. When government agencies adopt more innovative ways of delivering services, these have major flow on effects throughout the economy and to businesses' own adoption of innovative technology. While there is lots of talk about the 'innovation' of government operations and service delivery, in truth there is little evidence that agencies are being genuinely encouraged to innovate.

While the more aggressive approach to eGovernment announced by the Government in their pre-election *E-Government and Digital Economy Policy*³³ was welcomed, progress remains elusive. For example, despite a clear commitment to 'open public data' to drive efficiencies in government service delivery, the most valuable data sets that would drive innovation remain locked up, and where data is available the ability to access and use it effectively is patchy. The mooted ICT Advisory Board aimed to provide private sector ICT expertise to advise on the productivity benefits of ICT - nearly a year after the policy was announced, is yet to be formed. Similarly the dashboard of metrics to report Government's ICT performance has not been delivered.

AIIA raises these as critical because they provide clear opportunity for Government to build the innovation culture from within - in the departments and agencies over which it has direct control.

Regulation and Policy

Countries with a strong innovation performance typically demonstrate the value of a supportive policy, regulatory and institutional environment. Policies designed to incentivise innovation and support early stage and more established entrepreneurial ventures provide a critical underpinning in an effective innovation ecosystem. This includes, for example, appropriate tax relief for investment and risk taking, simplifying rules to help companies raise equity and debt capital, reducing the administrative burden of tax, regulation and reporting requirements; improving the accessibility and transparency of regulatory arrangements; and streamlining compliance requirements.

Industry dissatisfaction with current Employee Share Scheme (ESS) arrangements for example, is well documented. It is of major concern to AIIA that analysis undertaken by Deloitte shows that current ESS arrangements (post 2009 legislative changes) have resulted in a significant decline in their use, particularly amongst tech start-ups, looking for ways to attract and retain quality talent

²⁹ P A Gompers et al., "Performance Persistence in Entrepreneurship and Venture Capital", Journal of Financial Economics. Vol 96. No.1 2010

³⁰ <http://www.microsoft.com/enterprise/en-au/business-leaders/joined-up-innovation/default.aspx#fbid=XUZGQJKwVP9>

³¹ Ibid.

³² The Power of Three. Together, governments, entrepreneurs and corporations can spur growth across the G20. EY. 2013

³³ <http://lpaweb-static.s3.amazonaws.com/Coalition%27s%20Policy%20for%20E-Government%20and%20the%20Digital%20Economy.pdf>



to drive innovation and business growth.³⁴ While some 95% of the Deloitte survey respondents said they felt it is important to offer an ESS to growing their business, less than 65% have them, sighting administrative complexity and unfavourable tax treatment.

The fact that both larger companies (i.e. listed companies) and start-ups in other countries (e.g. the USA, UK, Israel and Singapore) are able to offer greater cash and/or access to ESS benefits, is a major impediment to holding innovative businesses in Australia. This is particularly true for innovative start-ups with limited access to capital and cash-flow, competing for staff and skills in a globally competitive market place.

The fundamental failure of our current innovation policy and regulatory environment, particularly when compared with some of our global competitors continues to play out as local technology companies move their operations overseas, principally to locations where they can access more favourable tax treatment to grow their business and/or where the tolerance for business and investment risk is higher.³⁵ The difficulty Australian start ups and even later stage companies have in matching the equity and option offerings of tech firms overseas was highlighted by Paul Fletcher himself in his recent speech to the Centre for Independent Studies.³⁶

By way of further example, while countries around the world are moving to expand their investment in R&D, Australia's R&D tax incentive requirements continue to be 'narrowed'. Legislation that disallows ICT related R&D in specific circumstances reinforces industry concern that the role of ICT in driving innovation and growth is poorly understood. The 'Internal Administration' exclusion in the R&D tax legislation³⁷, can be read to imply that any ICT R&D undertaken by a company for its internal use - including where it is undertaking ICT related R&D to improve delivery of its services to customers - is ineligible for the tax incentive.

The Government's decision not to proceed with the R&D quarterly credit arrangements for small businesses undertaking R&D particularly disadvantages small, start-up tech companies seeking to innovate. These arrangements, which would enable eligible companies to realise their R&D tax incentive/credit progressively throughout the year would address cash flow issues that limit ongoing R&D activity and in some cases, ensure the ongoing viability of the company.

While not an issue for the majority of R&D tax claimants, proposed amendments to the Income Tax Assessment Act 1997 to limit the R&D tax incentive to companies with aggregated assessable income of less than \$20 billion for an income year, sacrifices high end R&D for the sake of short term cost savings.³⁸ Such a targeted exclusion is globally unprecedented and fails to recognise the critical importance of large companies to Australia's R&D system.

34 Deloitte, (February 2014) Submission on Employee Share Schemes and Start-up Companies: Administrative and Taxation Arrangements.

35 Australian Financial Review, Wednesday 8 January 2014, p1

<http://www.paulfletcher.com.au/speeches/other-speeches/item/1101-speech-to-the-centre-for-independent-studies-our-national-competitiveness-and-where-the-digital-economy-fits-in.html>³⁶

37 Section 355-25 of the Income Tax Assessment Act 1997

38 [http://c.ymcdn.com/sites/www.aiaa.com.au/resource/collection/94A1EE83-F0B6-4B38-A7C1-92F4D2136438/140120R&Dexclusion\\$20Bcompaniesfinal.pdf](http://c.ymcdn.com/sites/www.aiaa.com.au/resource/collection/94A1EE83-F0B6-4B38-A7C1-92F4D2136438/140120R&Dexclusion$20Bcompaniesfinal.pdf)



Actions to support an Australian innovation system

In support of our proposition that sustained innovation is most effectively enabled by a system comprising the interconnection of the themes outlined above, AIIA makes the following recommendations in support of the future of competitive innovation in Australia.

While AIIA considers all the recommendations we have made a priority, we have identified as **Priority 1** those which we believe must be executed as a matter of urgency.

Infrastructure and Knowledge

To ensure Australia's innovation system is supported by the infrastructure and knowledge required to drive effective innovation outcomes, AIIA recommends:

Priority 1:

- The differentiated role of publically funded research to Australia's innovation system is recognised and better leveraged through a new model of engagement between universities and industry. AIIA recommends consideration of the UK Catapult program³⁹ which provides a physical hub to connect business, researchers and academics to stimulate innovation and support the innovation lifecycle. AIIA strongly encourages the Government to build on the now mature capability of NICTA to support and guide such a model.
- Availability of and access to high end technology developments and ubiquitous high speed broadband. Technology is a crucial enabler and platform for innovation across all industry sectors. Government needs to foster technology as a platform for innovation by supporting the open, free, decentralised and dynamic nature of the Internet

Priority 2:

- Public investment in basic research with a focus on national priorities that leverage Australia's competitive advantage.

Collaboration

Recognising the critical role of collaboration (at all levels) to drive high performance innovation outcomes, AIIA recommends:

Priority 1:

- Establish cross disciplinary and cross sector collaborative models such as the UK Catapult program to facilitate increased collaboration between researchers and business.
- Universities are incentivised to collaborate with industry to develop the commercial potential of their research.
 - This requires reassessment of performance based block funding arrangements under the Excellence in Research in Australia (ERA) program to rebalance the current focus on producing published research papers as opposed to applied outcomes.

³⁹ <https://www.catapult.org.uk/documents/2155693/2268412/What+is+a+Catapult/e68c7c90-39e0-45b7-be4b-9ba1e1c51232?version=1.2>



Priority 2:

- Establish a national register of intellectual property (IP) for Australian Government funded research institutions to speed up the commercialisation process. IP could be charged (or not) at different charge rates.
 - Where IP from university based research is not used within a specified timeframe that IP is made commercially available.
- Develop a mechanism that supports small and medium sized businesses contract with universities to provide stronger research capacity to their projects.
- Leverage smart digital technology to drive the creation, diffusion and application of knowledge.

Education and Skills

To ensure Australia develops the skills and capability to underpin sustained innovation development AIIA recommends:

Priority 1:

- Development of STEM skills is identified as a priority education focus for all students in years K-12.
- Implement and actively support the Digital Technologies Curriculum. A priority focus must be appropriate training and support for teachers delivering the curriculum.
- Continue to support the current Digital Careers program aimed specifically at increasing the take-up of ICT and specifically computer science courses at the tertiary level.
- To attract entrepreneurs from other countries introduce work visas for entrepreneur. This will help accelerate the growth and maturity of Australia's start up and innovation ecosystem and facilitate relevant skills transfer.

Priority 2:

- Develop a national program of education to support entrepreneurship. Schools and universities have an important role to play in equipping aspiring and potential entrepreneurs with the right skills and attitudes.
 - Such a program needs to be 'hands on' - not constrained by traditional teaching and academic models. A key focus should be giving students' experience of real world business challenges, including how these are managed.
 - Provide student mentoring and coaching programs aimed to provide practical support to young people interested in exploring innovative ideas and entrepreneurship. The support of existing entrepreneurs, philanthropists and innovative businesses - experienced advocates of innovation and entrepreneurship is critical.
- Develop a more integrated approach to driving innovation and entrepreneurship at the university level. This includes a multidisciplinary learning approach that brings together the science and technology students with the business students that could help commercialise their ideas - for example the Centre for Innovation & Entrepreneurship (CIE) at the University of NSW. The Diploma in Innovation Management is a unique multi-disciplinary program, which encourages students to explore an entrepreneurial mind-set and develops the knowledge and skills necessary for commercial innovation.



- Develop a national network of student start-up incubators as proposed in the April 2014 Crossroads Report.⁴⁰

Funding

To assist innovators and entrepreneurs access the capital they need to fund innovation and to appropriately recognise and support investors AIIA recommends:

Priority 1:

- Develop innovative funding platforms such as crowdfunding and microfinance as a means to encourage increased private investment.
- Tax relief for investors in innovative start-ups and high growth companies. This includes relief in the form of tax credits or a reduced rate of tax in the first instances and/or relief in the form of capital gains tax reductions or exemptions for qualifying venture investments.
- A government innovation fund to source new products, services and solutions from small business to support the development of solutions for government. The U.S. Small Business Innovation Research (SBIR) program is an example of such a model.⁴¹

Priority 2:

- Increasing R&D tax incentive credits in areas of R&D priority aligned with national growth objectives.

Culture

Australia's business culture is inherently risk averse. Innovation and entrepreneurialism is fundamentally about risk taking. To develop a more risk tolerant business culture and one that supports innovation AIIA recommends:

Priority 1:

- Government taking a leadership role in delivering innovative approaches to government service delivery.
- Actions that remove the stigma of 'failure', particularly in relation to business start-ups.
 - This could include amending bankruptcy laws to strike the right balance between protecting the interests of creditors and giving entrepreneurs another chance and providing additional tax relief for investors engaged with companies that go bankrupt.

Priority 2:

- Develop an entrepreneur scholarship program targeted at young people. In addition to providing financial support for young entrepreneurs to access relevant support programs and/or provide them some financial support while they focus on their idea, the program legitimises a career focus on entrepreneurship.
- Showcasing success. This includes businesses showcasing success and emphasizing the benefits of entrepreneurship including job creation and broader social and economic impacts.

⁴⁰ Crossroads. An action plan to develop a vibrant tech start up ecosystem in Australia, Startup AUS, April 2014.

⁴¹ <http://www.sbir.gov/>



Regulation and Policy

Policy and regulatory frameworks that facilitate and support innovation are essential. A number of existing impediments need to be addressed and more flexible policy design that supports innovation and entrepreneurial ventures. AllIA recommends:

Priority 1:

- Develop a whole of government approach to innovation policy with a focus on mechanisms that coordinate policies and activities across agencies.
- Reform current Employee Share Option arrangements to ensure tax on options is not applied until after the value has been realised.
- Introduce innovative funding platforms such as crowdfunding and microfinance. This includes a review of existing legislative arrangements including current prospectus requirements, ability to advertise fund/investment raising activities and support for p2p debt crowd funding from non-sophisticated investors.
- Reform government procurement processes to facilitate increased take-up of innovative solutions offered by small and medium sized business. Government can play a key role in driving innovation and developing innovative skills by using its purchasing power to engage with and 'invest in' companies with innovative solutions and capabilities. This also facilitates the maturity and growth of businesses and strengthens innovative supply chains.

Priority 2:

- Reduce the administrative burden of tax, regulation and compliance.
 - Simplifying tax codes, creating convenient, accessible online tools that help entrepreneurs and innovators navigate regulatory requirements and simplified rules to help companies understand and raise equity and debt capital smooth the innovation to commercialisation pathway. This includes streamlining ways for business to deal with all levels of government.



Conclusion

It is not intended that all the actions included in this submission fall on the shoulders of government. It is incumbent on both the public and private sectors to commit to the future of Australian's innovation system and in particular, a system that drives national growth and Australia's global competitiveness. Notwithstanding AIIA strongly urges the Government to proceed as a matter of priority, with implementing pre-election commitments it has made related to using ICT to drive an effective and vibrant innovative ecosystem.

Australia's future prosperity depends on the cooperation of government, academia and industry to build and maintain an ecosystem in which innovation is not only possible but thrives.

To conclude, AIIA strongly encourages the Senate Economics Parliamentary Committee to develop a bipartisan vision for the future of Australia's innovation system. This needs to be supported by a clear roadmap for action and engagement by government of the research, academic and business sectors in the prosecution of that plan. AIIA urges the Committee to act decisively and urgently to ensure Australia is not left behind in the global competition stakes.

