Telstra's submission to

The Senate Economics References Committee's Inquiry into Australia's Innovation System.

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Telstra Corporation Limited
ABN 33 051 775 556

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Executive Summary

Telstra welcomes the opportunity to make a submission to this Inquiry.

Creating a national culture of innovation, backed by a clear strategy and concrete actions,, is important in order to improve Australia's productivity and enhance economic prosperity. Acting on innovation in a holistic manner is not something that is merely desirable; we believe that it is necessary. As other nations prioritise and invest in innovation, Australia needs to ensure it too is positioned to innovate for the future.

The way the world communicates is rapidly changing. Telstra's submission reflects the way we have been adapting to meet those challenges and the value we place on innovation. Our business is especially influenced by changes in technology; however, innovation is not just technological and it's not just those at the forefront of digital disruption who need to be capable of embracing change. Australia needs an innovative culture to allow us to realise our potential as a nation.

Telstra has identified six priority action areas on which Australia should focus in order to design and deliver an improved innovation system. We have opportunities to invest in smart jobs, foster talent and build a culture of creativity and innovation. While traditional industries, including agriculture, mining and manufacturing will remain important to Australia, innovation in those industries and beyond will ensure Australia maintains its ability to effectively compete in an increasingly competitive world. Innovation is essential to ensure the industries of the future are created in Australia, and that we can grow and prosper.

Telstra believes all levels of society have a role to play in supporting and promoting innovation. However, government, those in education and the private sector play a particularly critical role in delivering an innovative country with a strong economy. Collaboration is recognised as an important component of innovation. As a telecommunications and technology leader, Telstra is creating partnerships with clever Australians and believes this collaboration is critical.

Just as corporations and creative individuals are often looked at to lead innovation, governments must play their part in facilitating a supportive ecosystem and role modelling innovation through the delivery of policy and programs that enhance Australia's innovation agenda.

Creating Innovation – six solutions to drive innovation in Australia

Telstra believes there are some important preconditions to fostering innovation and barriers that should be addressed in order to support an innovation agenda. This paper identifies the following six areas as critically important:

1) The need for a **national vision to drive a long-term commitment to innovation** that goes beyond budget and political cycles. A bipartisan commitment to the broader policy goals of innovation, combined with policy and regulatory certainty, is critical. A spirit of collaboration led by a National Innovation Council that provides policy advice and that champions investment on innovation is essential.

2) Education and skills are vital building blocks for fostering innovation:

   a) **Core educational skills in science, technology, engineering and maths (STEM)** as well as the humanities are necessary preconditions for creating multi-skilled individuals with the capacity to innovate. Not every Australian will become an engineer or IT specialist, but boosting core skills – from the very first years of formal education – is essential to ensure a generation of well-educated and trained students who have the ability to become our next generation of innovators.

   b) There is also a need to ensure that Australian companies can take advantage of global talent. **Visa rules** can be restrictive and many highly skilled foreign graduates, with much to offer Australia, leave the country immediately following their studies. Seeking to employ experts from overseas can also be problematic, and can deter the engagement of the best minds to work on local projects. Australian innovators – be they startups or established companies – should have access to the most skilled people, no matter where they are from.

3) A **base level of funding for research institutions** by government is critical to ensure that the costs of administration, as well as basic/pure research undertaken by organisations like the CSIRO and NICTA, can continue. It is also important to encourage a much greater transfer of knowledge and personnel between higher education institutions, government and industry.

4) There is a **need to ensure government policy supports and doesn't impede innovation**. There are several practical things the government can do in this area:

   a) Ensure that there is **regulatory certainty**, which supports investment and ensures that regulation does not stifle innovation by mandating approaches that may be superseded by improved technology or ways of working.

   b) Ensure that **employee share schemes** can be used effectively by startups. Government should move to quickly implement announced changes to reverse the discriminatory tax treatment.

   c) **Incentivise R&D for *all* Australian companies** – it doesn't make sense from a policy perspective to deny those companies with the greatest capacity to invest in R&D from accessing R&D incentives.

   d) **Support our Intellectual Property (IP) system** by ensuring that it is easy to use, accurately reflects changes in technology and is structured effectively to protect digital as well as physical assets.

   e) **Actively seek to support innovation** through championing and promoting the work of Australia's innovators by seeking to procure their products and services. Government is a large purchaser and can often better financially support and foster innovation by purchasing these products rather than through poorly targeted grants programs.

5) There is a need to **finance innovation effectively**. Small numbers of venture capitalists funding only early stage and low risk startups is not a sufficient base to ensure that innovation is effectively funded. Government has a role to play in helping inform and encourage the market to operate in a more supportive manner. Venture capitalists should be encouraged to engage with innovators and entrepreneurs – to understand and then support the market beyond the initial angel investment stage. Government can play a role in supporting the private sector in this area.

6) Governments need to **lead by example**. Whether it is in program design, purchasing, service delivery, communications, ICT, or even governance arrangements, the government has the power to choose innovative ways of working over traditional approaches. The Australian Government must look to implement innovative solutions to reduce costs and improve services to the community. Adopting a Digital First approach is an important step to model innovation in Government,

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What is Innovation?

Telstra encourages the committee to adopt a broad definition of innovation. Innovation doesn't only occur in a specific context or industry – there are economic, social and cultural examples of (and benefits to) innovation across all industry sectors. We support innovation occurring within government and in the way government agencies undertake their work.

Innovation is an important component of our nation's ambition to boost productivity and deliver sustainable economic growth. While corporations and creative individuals play significant roles in delivering innovation, they cannot do so alone. Governments play a critical role in establishing the environment in which innovation can occur, and should therefore play a leadership role in role modelling innovation.

Innovation is something that government can influence and even champion. It can be taught and should be celebrated so it becomes a part of our culture. We agree with the Commission of Audit that "governments can have an important influence on the incentives that affect innovation, investment and decisions on whether to participate in the workforce – all fundamental drivers of growth. Incentives are also influenced by the disciplines imposed by competitive markets."[1]

As many countries prioritise innovation and direct their national effort to supporting and growing their innovation systems, there is a real risk of Australia falling behind if it does not have a national innovation agenda. We must, as a country, do more to create the jobs of tomorrow and the brands of the future. Despite our natural advantages and generally high level of education, it will take action to ensure that we're ready to face the challenges – economic, social and environmental – and are not left behind.

Telstra approaches the future with optimism. Australians are naturally resourceful and we believe that we can continue to build on our history of scientific, technological and associated innovation.. Innovation should be seen as core part of delivering a strong Australian economy and not as a niche area of industry policy or passing fad. Every sector has the capacity to innovate and should be encouraged to contribute to this agenda. Australia has specific skills and expertise – in mining and agriculture as well as biotechnology and pockets of advanced manufacturing – and should build on those strengths in seeking to develop and implement an innovation agenda.

While there are clearly major opportunities in the ICT sector, it would be a mistake to view innovation as something only for technology-focused companies. We believe no one can afford to leave the job of building an innovative country to others – it's an endeavour in which we all must share.

International institutions, including the OECD, World Bank and most recently the B20, have focused on innovation as a driver of growth. It is increasingly accepted that in an age of ever-faster technological change, the jobs of the future will be created by innovators. Australia has the capacity to harness the creativity and ingenuity of our people to create highly skilled and paid jobs to replace those being lost by changes in technology and business models. However, this will not happen through businesses and individuals alone, and is unlikely to occur with sufficient scale if not endorsed by government.

The committee should see the innovation system as extending from entrepreneurs and the startup community, to individuals and businesses who are innovating in existing organisations. Innovation is not something that can only happen in one part of the economy or one model of commerce – it must be pervasive across every part of society.

[1] Department of Finance 2014, *National Commission of Audit*, Australian Government, Canberra

Likewise, innovation at its best is a collaborative endeavour with various roles for a range of people across the economy and society. Smart people can come up with a great idea, but they'll need teams of people to scale up, to invest, to market and to sustain them. Telstra wants to see greater collaboration in the development and funding of innovation in Australia, and is prepared to actively partner with government to play a part in the national innovation agenda.

Telstra sees a difference between invention and innovation, though both form part of the innovation system and both are worthy of support. Some innovations are borne of invention, but others are refinements to processes or systems. Both can be major contributors to productivity.

While the OECD gave Australia a relatively positive scorecard on innovation in 2012 when compared with other OECD countries[2], it highlighted areas for improvement, including the need to expand research from being principally undertaken in universities to broader partnerships with industry. Governments have a role to play in helping undertake these sorts of transitions.

Australia's innovation challenges and opportunities

Innovation can contribute significantly to the improvements in productivity that drive economic growth and better living standards. Telstra supports the many submissions that have made this link.

And there is strong evidence to substantiate the clear link between R&D and productivity. The OECD argues: "There is little, if any, dispute that R&D is a major source of long-term productivity growth."[3] Economic growth is significantly expanded through investment into R&D, which has been evidenced in many OECD countries and newly industrialised economies, such as Singapore[4]. This is further evidenced in that: "R&D expenditures contributed substantially to output growth in a variety of industries in the USA and Japan."[5] While R&D costs businesses money, it is also an investment and devoting resources to R&D can increase national productivity.

Smaller firms are not as capable of undertaking R&D as larger firms, yet everyone is capable of innovating. At the heart of improving productivity is the desire to more efficiently and effectively use inputs to increase production, output and, ultimately, living standards. Corporations seek to improve their levels of productivity to benefit their shareholders, staff and customers. Yet the way in which those productivity benefits can be achieved vary. Changes in work practices and greater use of technology are the most traditional ways of boosting productivity. More forward-looking – and ultimately more transformational – step changes in productivity invariably require investment in R&D. Large businesses are generally resourced to undertake such transformational and nation-building infrastructure developments. However, a recent ABS report indicated that 20 per cent of Australian businesses lacked the funding to be able to engage in innovative activities [6]. Such large-scale projects produce "flow on" impacts to the broader economy, including employment and attraction of foreign investment.

[2] Organisation for Economic Co-Operation and Development 2012, *Science, Technology and Industry Outlook*, http://www.oecd.org/australia/sti-outlook-2012-australia.pdf ,Organisation for Economic Co-Operation and Development, Australia

[3] OECD, *Empirical analysis of the effects of R&D on productivity: implications for productivity measurement?* http://www.oecd.org/std/productivity-stats/37511005.pdf

[4] National University of Singapore, *The impact of R&D on the Singapore economy: an empirical evaluation*, http://www.academia.edu/180525/THE_IMPACT_OF_R_and_D_ON_THE_SINGAPORE_ECONOMY_AN_EMPIRICAL_EVALUATION

[5] ibid

[6] ABS, Innovation in Australian Business, 2012-13- Number 8158.0

In the area of Information and Communication Technology (ICT), in which Telstra principally operates, it is widely acknowledged that productivity is being driven by the rollout of new technology and ways of working. Telstra endorses the AiGroup Submission, which points to investing in new technology as an important policy priority in supporting innovation.[7]

Innovation is hard to do alone – it requires collaboration.

For the benefit of economic growth and the social and cultural life of Australia, we encourage the government to place innovation at the heart of its economic agenda. Innovation has a strong link to productivity[8] and is not the same as invention,[9] although it can be. Telstra also firmly supports Microsoft[10] and the Deloitte Access Economics Paper submitted by the Business Council[11] that innovation is hard to do alone – it requires collaboration.

Australia has a mixed record on innovation. We have some excellent research institutions, but a failure to consistently commercialise and build new businesses.[12] The relatively low level of university-industry collaboration (Australia is 15 compared with the US at 3) could be a reason.[13] The ABS also indicates that fewer than 10 per cent of Australian businesses that are active innovators have a relationship with a university or research institution.[14] There is also evidence that our base level of education is falling, especially in science, technology and maths.[15]

This isn't the first time a review of innovation has been undertaken in Australia – there have been reviews and policy changes on this subject for decades and yet the need for action on innovation is critical if Australia wants to diversify its economy and operate at a more global level. The time is now for a long-term, sustainable and bipartisan commitment to innovation.

While Australia is reducing the support it offers its largest companies for investment in R&D, other countries are expanding their innovation agendas. Singapore and New Zealand are among the economies that are seeking to promote innovators with a range of targeted incentives.[16] China is investing heavily in education from school to university and is supporting high-profile, world-class academics and universities. The most progressive countries are developing ten-year innovation and ICT visions.

Australia can lift its innovative performance by boosting education, especially in the areas of science, math and technology. With increasing evidence of teachers working outside their area of speciality in these disciplines, we risk losing the students who should be aiming to undertake further education in this area.

Australia can also expand the public promotion and celebration of innovation. The prestigious Prime Ministerial Awards for Science and the well-publicised National Science Week are a good start, but we can and should do more. Internationally, celebrations of innovation are widespread by government

[7] Australia Industry Submission #150 pp. 23-26

[8] Report on Australia's innovation system chapter 2

[9] Department of Finance 2014, *Innovation*, Australian Government, Canberra, <http://www.business.gov.au/business-topics/business-planning/innovation/Pages/default.aspx?utm_source=businessgovau-old-website&utm_medium=301-redirect&utm_campaign=Innovation>.

[10] Microsoft 2014, *Joined Up Innovation*, Microsoft,<http://www.microsoft.com/enterprise/en-au/business-leaders/joined-up-innovation/default.aspx#fbid=QEdkQCZuVqZ>.

[11] Deloitte Access Economics, *Australia's innovation imperative*, pp. 33- 39

[12] 2013 Inovation Report, Australian Government

[13] Compete to Prosper: Improving Australia's Global Competitiveness, McKinsey Australia for the BCA, page 34

[14] ABS, Innovation in Australian Business, 2012-13- Number 8158.0

[15] http://ourtimes.wordpress.com/2008/04/10/oecd-education-rankings/

[16] Page 22 of this submission

and by industry and we should aspire to celebrate innovation in the way we celebrate national sporting achievements.

One recent approach from NESTA, a UK charity with a mandate to research and promote innovation, is worth considering in Australia. At the World Economic Forum in Davos, NESTA launched the European Digital Forum, which is designed to bring innovators together and spread their voices to the broader community.[17] Similar collaboration between government, industry and civil society could work very well in Australia.

We should aspire to celebrate innovation in the way we celebrate national sporting achievements.

[17] http://www.nesta.org.uk/news/european-digital-forum-launched-davos

Recommendations

Recommendation 1

There needs to be a long-term national vision and commitment to innovation; this could be led by a National Innovation Council or similar body.

Governments have over many decades indicated their support for innovation through policy statements and often niche industry or sector-based programs. However, innovation cannot be imposed nor can it be seen as a program or initiative with a one or three-year time horizon. Innovation is best seen as an important macro-economic goal, rather than something only to be promoted in a specific sector or sectors. Fundamentally, innovation needs high-level support, a collaborative approach and a set of specific policies.

Some areas, like education and research are long-term investments that require consistent funding support to deliver the required objectives. Other initiatives, such as encouraging the procurement of innovative products and services, requires agility in order to take up the opportunity. Yet the challenge must be to work simultaneously on what can be achieved quickly and on the second and third horizon opportunities we need to plan now in order to deliver in the future.

While it is not the job of government to innovate for Australia, it can and should ensure the foundations are in place to foster innovation.

A long-term, bipartisan commitment to innovation is critical to delivering Australia the economic competitiveness and future prosperity we seek. While it is not the job of government to innovate for Australia, it can and should ensure the foundations are in place to foster innovation. It should also ensure that as an entity and sector itself, the government and public service is open to new ideas and ways of working as this also supports innovation.

The government should recognise and support the breadth of innovation. There is innovation in large and small organisations, among startups and established businesses. Too often, innovation policy has worked to support only very slim slices of the innovation pie rather than seeking to grow it. Deep support in areas like research and education will produce results in innovation if coupled with regulatory and taxation certainty. Government should not look to “narrowcast” its support for innovation, but to ensure it is broad enough to support innovation across the economy.

While innovation is often applauded, it can produce changes that are disruptive. There are countless businesses and industries that have disappeared due to new technologies or ways of working. The impact of these changes, and the transitional effects they cause, highlight a special role for government.

Telstra does not wish to be prescriptive in how the government wishes to lead work to deliver the national vision. We support a long-term, sustainable, multi-year strategy, yet recognise that there are many approaches that have been raised in submissions. A version of the NESTA European Digital Forum is also a possibility the Government may wish to consider.

We support the notion, outlined by the Business Council in their submission, of a National Innovation Council to be established by government and suggest that it contains a broad membership comprised of leaders in all sectors of the Australian economy and society. Such a body, supported by a small secretariat, can provide policy advice, assist in setting priorities for innovation actions, help prosecute the public case for innovation in Australia and provide a clear focus for Australia’s innovation agenda.

Through collaboration and a supportive innovation ecosystem, Australia can deliver more world-class innovations.

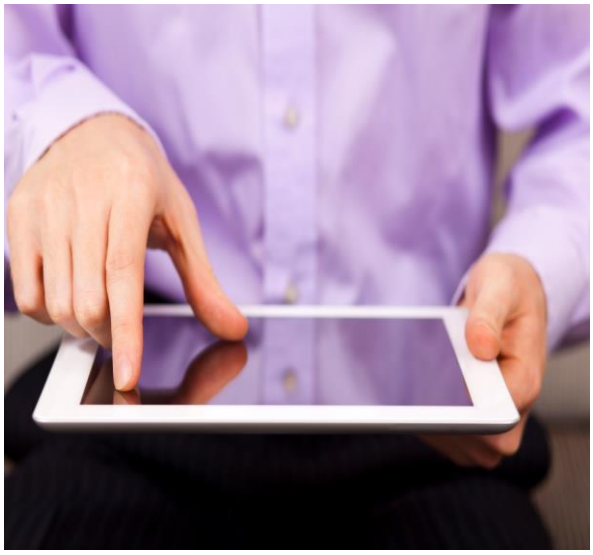
Innovation doesn't just happen; it needs to be supported. The experience from Silicon Valley is that entrepreneurs need to lead the startup community, these communities need to be inclusive and there must be a long-term commitment to their work with contributions from a range of actors. Industry large and small, investors, mentors and skilled professionals all need to work together to build an innovation ecosystem.

Australia has small and emerging hubs of innovation that have often been spawned by larger industries and their trained workforce, and there is no reason why they cannot grow in size and importance. Indeed many mining services companies are small to medium enterprises supplying multinational companies. Australia has particular industry and innovation strengths that can fuel the next generation of innovations.

The driverless trains at Rio Tinto's Pilbara operations are a world first and were driven by a desire to maximise Australia's capacity to deliver productivity benefits in mining and allow the savings generated to open more mines and employ more Australians.[18]

On a smaller scale, Telstra's National Business of the Year in 2014 is REDARC, an electronics company in South Australia that develops batteries and associated products. REDARC is a high-growth, high-quality manufacturer that has focused on innovation, deep customer understanding, targeted marketing and investment in new capability. REDARC demonstrate that with a very strategic focus on their value proposition, as well as partnerships with universities and high levels of investment in R&D and production quality, domestic manufacturers can capture value and not just survive, but thrive.

Biomedical science and biotechnology are particularly strong sectors where close collaboration between academia and industry is helping to bring innovative ideas, products and services into life and onto market. Melbourne has six biotechnology hubs with expertise in human health, agriculture and animal sciences. "Collectively, these research precincts have the highest level of research spend and granted patents in Australia," [19] making them worth examining as case studies for innovation success.



Challenging the next frontier of innovation will require strong skills in software development. Australia benefits from a strong supply of home grown software developers as well as hosting international firms who undertake software R&D and testing in Australia.[20] While Australia has the capacity and talent, there are concerns that collectively not enough has been done to deliver the education, skills and taxation policies required to grow our software industry.[21] Telstra has sought to encourage innovation in the use of ICT and software through supporting the Machine to Machine Challenge, this year won by a team at Monash University who produced an app that allows train travellers to see the progress of trains in real time including seating information.[22] [23]

Just like Israel and Singapore have managed to

[18] http://www.miningaustralia.com.au/news/rio-tinto-approves-driverless-trains-for-pilbara
[19] http://www.biomelbourne.org/content_pages/display/94
[20] http://www.austrade.gov.au/Buy/Australian-Industry-Capability/ICT/default.aspx
[21] http://www.smh.com.au/it-pro/it-opinion/whatever-happened-to-australias-software-industry-20130727-hv0na.html
[22] http://exchange.telstra.com.au/2014/05/08/challenging-university-students-to-innovate-with-the-m2m-university-challenge/
[23] http://www.telstra.com.au/aboutus/media/media-releases/monash-university-students-win-telstra-m2m-challenge.xml

drive innovation with small populations, there is no reason why Australia cannot do the same. Australia already has the building blocks required to become a leading innovator. The recent global index on innovation placed Australia at 17, just above New Zealand,[24] but behind Israel and South Korea and leaders Switzerland and then the UK. There is much we can learn from others as we endeavor to create Australia as an innovation ecosystem.

Ernst & Young's submission states that public policy can be successful in creating "a culture of innovation and a healthy innovation ecosystem."[25] The EY submission refers to the OECD, which notes: "Even countries that have generally refrained from active industrial policy...now seek new ways to improve the environment for innovation."[26] All sectors of the economy – from government to large, medium and small business – need to engage to achieve success.

In addition to quality people, Australia requires an economy willing to back innovation with resources and a suite of supportive government policies. Australia needs to move beyond academic fears that championing innovation is about undue intervention or "picking winners" in a particular industry or area of the economy. While inappropriate for the Government to select the innovation it would like to see – for that is not how innovation works – it is essential for government to stand up for the notion and to support appropriate legal, regulatory and financial avenues for innovation. When there is no rational case for any one individual or company to address on their own, or where there is market failure, there is an appropriate role for government to intervene.

Governments can champion innovation by seeking to make their own operations more efficient and effective. The Commission of Audit proposed that Government speed its moves to digitise its operations, move data into the cloud and to make data available, in non-identifiable form. Undertaking these recommendations – among others – show a commitment to supporting innovation and will help boost an efficient market in the provision of these services in Australia.

Recommendation 2

Invest in education and skills

2a. Core education skills are essential to creating innovation

Investing in education and skills at all levels is absolutely critical to developing and supporting innovation. It is also possible to teach students to be more inquiring, creative and innovative. Strong post-graduate candidates need the strong foundational knowledge they gained from the school, as well as the university, system. The OECD and World Bank both point to education in STEM subjects as the key to enhancing innovation.

Investments in education, especially STEM, is the only way to provide the base skills students need so they can later become engaged in the systems and design thinking upon which innovations are founded. Core numeracy and literacy skills, as well as emerging core skills (such as coding which is explained in more detail below) will give young Australians the agility to move between jobs and careers.

In addition to STEM, new research highlights the important role that humanities also plays, as these disciplines equip students with critical thinking and problem solving skills, especially those relating to ambiguity. The Australian Industry Group has proposed a significant policy agenda in their paper *Lifting our STEM skills*[27] and we endorse their work and call for investment in the early childhood education, the school system and into higher education.

[24] *The Human Innovation Factor* 2014, Global Innovation Index, <https://www.globalinnovationindex.org/content.aspx?page=gii-full-report-2014#pdfopener>.

[25] Ernst & Young Submission #95

[26] ibid

[27] *Lifting our STEM Skills*, AiGroup, 2012 http://www.aigroup.com.au/portal/binary/com.epicentric.contentmanagement.servlet.ContentDeliveryServlet/LIVE_CONTENT/Publications/Reports/2013/Ai_Group_Skills_Survey_2012-STEM_FINAL_PRINTED.pdf

Australia needs to adopt a broad view of innovation that explicitly acknowledges the fundamental role of non-technological innovation.

We endorse the views of the Australian Academy of the Humanities who say in their submission to this Inquiry that: "Australia needs to adopt a broad view of innovation that explicitly acknowledges the fundamental role of non-technological innovation."[28]

In our experience, even in the area of technology, skills that are taught and honed in the humanities – such as critical thinking and speaking for the user – also play a vital role. The quote from Westpac's Chief Experience Officer, Ian Muir, in the submission – that humanities expertise "may help bridge the divide that seems to exist between business thinking and design thinking" – is also illustrative of the fundamental nature of innovation: that as well as often disrupting industries, it can unite different silos of academic thought.

Investing in teachers and schools as well as TAFE colleges is an important part of investing in education. International best practice is for school teachers to be highly educated, often at a Masters Level, to be well paid and, most significantly, to be respected within the community. In addition, it is not beneficial for students or our future innovators if educators are forced to teach in areas outside of their discipline. In particular, the lack of science, technology and maths teachers means that less experienced teachers are often leading these vital subjects. Remuneration in the Australian education does not allow specialist STEM teachers to be paid salaries commensurate with what they would receive in higher education or industry, making a teaching career less attractive to talented STEM professionals.

While Australia should aspire to teach and train its STEM teachers to international standards, technology can also help deliver the world's best teaching to Australian students. Massive Online Open Course and Coursera type models cannot only be used to make international educational expertise available to Australian teachers, but could also be evolved to deliver both primary and secondary education so that all students get access to the world's best teachers. Australia is a world leader in distance education, perhaps an example of innovation borne out of necessity, and with the further rollout of high speed broadband to the Australian community,,innovative models of learning should be trialled and evaluated.

In order for the nation to increase its contribution to the innovation system, education, particularly STEM education, will need to be well funded.

Telstra believes the focus of government should be on ensuring that there's a well-educated and agile workforce that is able to take advantage of change. This is just as important for young students as it is for older workers and those looking to retrain.

In order for the nation to increase its contribution to the innovation system, education, particularly STEM education, will need to be well funded. The OECD has identified a 13.4 per cent return on government investment in higher education, which is in the top four of Australia's exports.[29] Adequate funding for this sector will ensure that we encourage and retain potential students in Australia who can develop their skills in an appropriately equipped environment. To be effective, however, funding needs to be targeted so that qualified STEM professionals are attracted to roles in education.

Telstra is one of the largest employers of science, technology and maths professionals in Australia. We have a strong and productive workforce, yet as we move to transition our company to meet the challenges of the future, we recognise that a significant ongoing investment in core and emerging skills will be critical.

[28] Australian Academy of the Humanities, Submission #88, page 161

[29] University of Melbourne Graduate Student Association Submission # 43

Likewise, if Australia wishes to increase its innovation agenda, it will need to produce increased numbers of STEM graduates in order for this to happen. Current indications are that there is a rise in commencements, but a decline in completions in science, computer science and engineering courses. This is coupled with declining numbers of female graduates. Telstra currently struggles to recruit a gender balance among its STEM graduates, which is a significant concern as we seek to build a balanced organisation. The disparity between enrolments and completions is also concerning, and should be addressed by government in partnership with the university sector.

The gender gap in STEM is an important one that must be confronted as part of addressing the broader gap in graduates. This disparity is concerning as STEM jobs are often high paid and a lack of gender balance at the tertiary level contributes to the gender pay gap in later years. As one way of contributing to the gender equality we would like to see in STEM, Telstra supports Robogals, an international student run organisation that started at the University of Melbourne and now extends worldwide with chapters in the Asia-Pacific region, North America, the UK and Europe. The case for change section of the Robogals' website clearly identifies the gender gap that exists from school and into university.[30]

Robogals uses fun and educational initiatives aimed at girls in primary and secondary schools to inspire interest and build proficiency in engineering as well as robotics – key areas required for innovation.

Coding: a new foundational skill

In order for Australia to successfully develop and enhance its global innovation agenda, we need to ensure our future students are equipped with the necessary skills to do so. Key to this will be ensuring that these students develop their technical skills at an early age. Coding and programming is not part of the current educational curriculum, meaning that students are leaving their primary and secondary education not knowing the basics of computer science. Cultivating this interest early on in students will help increase the uptake and completion of IT-related degrees, leading to a future workforce that is well-prepared to innovate, create and design.

Internationally, from September 2014, Britain will be introducing programming into their curriculum for all state primary and secondary school students.[31] Mike Cannon-Brookes, co-founder of Australian enterprise software firm, Atlassian, has stated that introducing coding into the foundational education will be key to Australia's commercial success, and believes that the "current state of IT education could put the nation at a competitive disadvantage, not just in the technology sector, but across all businesses."[32]

Many other countries are recognising the important of teaching coding to students, with the US, Israel, New Zealand, Germany and Denmark all placing a higher importance on computer science.[33] There is currently a shortage of skilled programmers globally,[34] so investing in quality education across all levels will ensure Australia is not left behind in the future and is able to be a leader on the technology front. Estonia is educating primary school students from the age of six to program a multitude of electronic devices, which lays a very strong foundation for their future.[35] The key, however, will be to ensure our teachers are qualified to teach the subject to students so that a quality syllabus is delivered. A recent study revealed up to 58 per cent of years 7-10 ICT teachers and 48 per cent of years 11-12 ICT teachers were not sufficiently qualified to teach those subjects.[36] Investing in teacher

[30] http://www.robogals.org/about/the-case-for-robogals

[31] Han, M, The Australian Financial Review, *Should schools teach coding as part of the curriculum?*, 18 June 2014, http://www.afr.com/p/futureforums/should_schools_teach_coding_as_part_NoFew2q9krMAFmSFXoYFgL

[32] Ibid

[33] The Economist, *A is for algorithm,* 26 April 2014, http://www.economist.com/news/international/21601250-global-push-more-computer-science-classrooms-starting-bear-fruit

[34] ibid

[35] Foo, F, The Australian, *Primary students learn to program,* 25 March 2014, http://www.theaustralian.com.au/technology/primary-students-learn-to-program/story-e6frgakx-1226863685973

[36] Han, M, The Australian Financial Review, *Should schools teach coding as part of the curriculum?*, 18 June 2014, http://www.afr.com/p/futureforums/should_schools_teach_coding_as_part_NoFew2q9krMAFmSFXoYFgL

training is the only way to ensure that our students learn the skills necessary to further the national innovation agenda of this country.

Industry and professionals with skills can also help with coding. Along with other talented individuals and firms, Telstra staff and contractors have volunteered, in their own time, to participate in coding clubs in Melbourne and Sydney schools.[37] Code Clubs originated in the UK and are spreading rapidly worldwide. In a related initiative to Robogals, Code Clubs in Australia are attracting talented women with a desire to promote coding to girls.

2b. Global, as well as Australian, talent is important for boosting innovation

By their very nature, many of the innovations brought about by technology are international. No longer can Australia just look domestically to grow jobs; we need to continue to engage internationally. A free flow of ideas, along with the benefits of cross cultural exchange and migration, has always been a part of the Australian way. Governments should continue to support opportunities for this free exchange to support the jobs of the future. Supporting the innovation system will also help retain skilled Australians, too many of whom have left to work overseas in search of career opportunities.

Telstra is the number three recruiter in Australia, and employs a significant number of STEM graduates as well as a highly trained operations workforce. Our Operations Division consists predominantly of male engineers, programmers and other STEM professionals. Telstra aspires to a gender-balanced workforce as part of our commitment to diversity and inclusion, but we struggle, even at the graduate level, to recruit enough female graduates. The STEM skills shortage and lack of gender equality amongst STEM professionals means Australia too may have to look overseas to gain all the skills we need to grow and prosper.

Creating stronger links with international partners will be vital to furthering Australia's innovation agenda. Being a small nation, we need to recognise that there are many great minds elsewhere in the world and it is important for us to attract them here.[38]

Recommendation 3

Support funding for research

With completions in STEM subjects declining, there is the risk that the pool of higher research candidates and academics will also shrink. This is likely to lead to a bigger shortage of skilled STEM professionals in teaching, research and in industry. Australia's Chief Scientist, Professor Ian Chubb AC, argues that the current number of STEM graduates is insufficient to support Australia's innovation agenda and high technology economy.[39] Government is best placed to support basic research and should ensure that the number of graduates is sufficient to ensure Australia has a strong base of locally trained professionals who can support innovation.

Investment in STEM education will be key to placing Australia at the forefront of global innovation – and retaining this position well into the future.

[37] See www.codeclubau.org for the Australian chapter of this international movement.
[38] Group of Eight submission #13
[39] Innovative Research Universities submission #86

The OECD acknowledges that R&D are amongst the most significant drivers of productivity growth in major economies. Today, with economic success increasingly reliant upon innovation, STEM education will provide future graduates with skills in evidence-based thinking and problem solving.[40] Investment in STEM education will be key to placing Australia at the forefront of global innovation – and retaining this position well into the future.

Economies of all levels are prioritising innovation and: "At the core of almost every national innovation agenda is a reliance on STEM research."[41] The creation of an innovation supply chain is central to NICTA's submission[42] and it resonates with the approach Telstra is making in our submission too – we cannot innovate without strong skills in education and research, and partnerships with industry that allow for the products of innovation to be commercialised.

Supporting pure/basic research is a core goal of government. While companies should invest in R&D and apply knowledge to their business, it is the role of government to provide a base level of support for research institutions.

Government and universities often look to industry to support research. Greater collaboration between the university sector and industry is important and Telstra has recently moved to build a research partnership with a number of higher education institutions and research bodies. However, core and basic research by its nature is about exploring possibilities and stretching boundaries. It does not provide a clear return that can be attributed to any one individual or firm. For that reason, the Commission of Audit has indicated that government funding for basic/pure research is essential.[43]

Telstra's contribution to research and innovation

Telstra recognises that the role of a company is to apply research and innovation, and not just carry out pure research. We have created a significant research partnership with the university sector and this program, beginning with a signed agreement with NICTA, is designed to explore opportunities flowing from technology advances and cutting-edge research that could benefit Telstra and our customers. The Research Partnership Program complements Telstra's existing innovation agenda, which includes an in-house platform for crowd-sourced innovation, the muru-D incubator for start-ups and the Telstra Ventures group, which takes a broader, global view of opportunities in the industry (see appendix 1).

We want to expand the breadth and depth of our relationships with research institutes over time to ensure the highest quality outcomes. Much of the work with NICTA relates to parts of our business that are of great importance to Australia and our customers. Telstra wants to gain further insights into the growing demand on our networks and how that can further inform our overall network strategy and investment approach. We're also looking at the security and privacy of the data our customers entrust with Telstra, and exploring future products and services that can give customers more control over how their data is used.

Recommendation 4

Government policy must support innovation

[40] Chief Scientist of Australia 2014, *STEM Education in the workplace*, The Chief Scientist of Australia, Canberra.

[41] Chief Scientist for Australia's submission #20

[42] NICTA submission #153

[43] Department of Finance 2014, *National Commission of Audit*, Australian Government, Canberra

Government policy can play a significant role in supporting or inhibiting innovation. The following recommendation covers a range of specific Government actions, including regulation, taxation, and intellectual property. A holistic approach to ensuring that Government policy drives and doesn't inhibit innovation is critical to boosting Australia's national innovation performance.

4a. Regulatory certainty is needed to support innovation

Open markets with consistent regulatory environments allow innovation to flourish. Yet governments can stifle innovation when they unnecessarily intervene in markets or fail to repeal outdated regulation. Just as innovation is an expression of change, so too must governments be active and able to change. Telstra propose that rather than searching for further ways to engage in markets, government must rather ensure that the regulatory environment does not hamper innovation.

Stable regulation also supports investment. Companies who invest significant resources in capital investment do so in order to reap the rewards of taking that risk. They do not do so to see the benefits redistributed via regulation. If businesses believe that they will be supported in free riding on the investment of others, it sends the very worst signal to the broader business community – and indeed to entrepreneurs.

Open markets with consistent regulatory environments allow innovation to flourish.

Regulatory approaches also need to recognise changes to the location of assets and businesses. Digital assets, including software and electronic applications, are by their nature global, and so will not easily regulated by static domestic policies and legislation.

Australia has a sound intellectual property system, regulated well by IP Australia. However, the world of digital assets is fast moving and there is a risk that the IP system will fall further behind changes in technology.

Telstra believes that there are current legal and financial hurdles to innovation and options to support innovation and this paper address those issues individually. Many regulations require specific types of technology or applications to meet the policy objective of the regulation. Call number display, untimed local calls, requirements to advise customers that the service they are receiving is a VoIP service and specific technology types to deliver disability equipment are all examples of regulatory goals that lock in old technology and do not allow for new ways of supporting that goal.

Lark's Distillery – Telstra Business Award Tasmania and National Small Business Award Winner 2014

Bill Lark was surprised that Tasmania, with so many characteristics similar to Scotland, did not have a single whisky distillery. When he investigated, he found out that there was a outdated law that forbid the distilling of spirits by small-scale providers (obviously to stop production of unregulated and untaxed alcohol). He approached his local MP and sought to get the law overturned, resulted in him launching his business fifteen years ago. There are now many whiskey distillers and a burgeoning whiskey tourism industry emerging in Tasmania. A new industry was born from the demise of an outdated piece of legislation.

4b. Employee Share Schemes

Reversing the current discriminatory tax treatment of employee share ownership schemes is critical if we wish early stage companies to be able to attract and retain high quality talent. Many startups have raised this issue with Telstra as one of the most significant impediments to their growth.

Telstra strongly supports the Australian Government's stated position to remove the 2009 taxation changes that sought to penalise the offering of share options in lieu of cash by making them immediately taxable. While these provisions were enacted as an anti-avoidance provision, they have prevented cash poor companies, most critically startups, from rewarding high calibre staff with a share of the business and a chance to benefit from any growth.

While this change can be made independently of any innovation strategy, the fact that it has not been made to date – even after having been raised as a barrier to innovation – is itself a concern. The integrity of the taxation system is a critical matter for government. Yet while the law has protected the revenue, the ability for startups to self-fund their own innovation and growth has been hampered.

A strong national focus on ensuring innovation would ensure that such barriers are identified and addressed early and as a matter of national priority.

4c. Research and Development and other taxation issues

Research and development (R&D) is not the only dimension of innovation, but it is an important one. Undertaking R&D is an investment and, by its nature, a discretionary one that carries risk. By undertaking R&D, a company is making a decision to look beyond business as usual to new ways in which it can operate and serve its customers. Governments have tended to support R&D on the basis that encouraging businesses to undertake investment in areas of potential growth may ultimately deliver broader benefits.

Telstra has provided a previous Inquiry by this committee with a submission in favour of ensuring that all companies are able to access the current R&D tax arrangements.[44] This submission states that while Telstra does benefit from the concession, there are broader reasons to support the ability of all companies to access the concession. These include:

- R&D is a business cost like any other cost. Increasing the after-tax cost of R&D will discourage investment, if only at the margin. It will also mean that Australia will become a relatively more expensive place in which to undertake R&D. By way of comparison, Singapore has continued to attract R&D to be undertaken there and has increased its R&D deductions to 400 per cent (from 150 per cent) on the first 400,000 Singapore dollars of eligible expenses. Other nations also compete for investment on the basis of their concessional R&D rates.
- Whether or not the R&D incentive encourages the largest companies to undertake any additional R&D than they would otherwise, it certainly encourages them to undertake those R&D activities in Australia (either directly or through contracted R&D with enterprises in Australia including small and medium enterprises). Such activities create jobs in Australia and result in wages, salaries and profits, all of which are taxable in Australia. The OECD, in a conference on knowledge-based capital last year, specifically highlighted the role that global tax incentives may have on reducing domestic employment.

Ensuring R&D is undertaken in Australia is an important part of keeping our economy thriving for decades to come and ensuring that we retain the best and brightest minds of the field in order to significantly contribute to the national innovation agenda. Former Vice Chancellor of Monash University Professor Edward Byrne's submission made the point that as a nation Australia has not

[44] Telstra's R&D Submission to the Economics Committee

been successful in turning innovation investment into jobs creation and suggested we must: "develop and increased presence in niche and clever industries to sustain our economy."[45]

A strong innovation system should contain appropriate incentives for undertaking R&D that are available to all taxpayers.

Internationally, post-GFC revenue pressures on governments – together with an increased focus on taxpayer compliance and a perception that the international tax rules are being exploited by multinationals – led to the OECD's Action Plan on Base Erosion and Profit Shifting (BEPS). Much of the media attention has centred on US technology companies (e.g. Apple and Google).

The BEPS plan, released in July 2013 and endorsed by the G20, proposes fifteen actions to reform the international tax framework, with initiatives ranging from designing tax rules for the digital economy to transfer pricing (especially in relation to intangibles), transparency, information exchange and tax treaty abuse.

Many of these actions have the potential to impact not only Telstra, but also all global multinationals competing in the Internet and technology markets.

The digital economy

One of the OECD actions (Action 1) is to "Address the Tax Challenges of the Digital Economy." The OECD's draft paper (issued in March 2014 and due to be finalised in September 2014) examines the emergence of the digital economy (including examples of new business models), highlights common tax strategies that cause tax base erosion and profit shifting issues, and identifies potential options to address them.

Common tax planning features in the digital space that are identified as raising base erosion and profit shifting concerns include:

- Avoiding a taxable presence in the "market" country, i.e. the country where customers are located
- Minimising functions, assets and risks in the market country, e.g. by limiting in-country activity to marketing (not sales), or putting intangibles in a tax haven
- Maximising deductions in the market country, e.g. by charging royalties to, or highly leveraging, the in-country subsidiary
- VAT/GST avoidance, e.g. digital sales by an offshore vendor who does not register for VAT/GST purposes.

One of the challenges for Australia as a capital importer is to ensure that foreign companies that operate here and/or sell to Australian customers are taxed appropriately. This ensures a level playing field. On the other hand, the challenge for outbound MNCs like Telstra is to remain competitive globally, having regard for the risks of tax reform in the foreign markets in which we operate.

Preferential tax regimes

The OECD also recognises the challenge of so-called "preferential" tax regimes and the concern that these could lead to a race to the bottom that would ultimately drive tax rates for certain types of mobile income to zero. BEPS Action 5 is to "Counter harmful tax practices more effectively, taking into account transparency and substance". We would agree with the Business and Industry Advisory Committee to the OECD that tax is a business expense to be managed and businesses should be able to respond to tax incentives offered by governments ("BIAC Statement of Tax Principles for International Business", September 2013). In our view, there is nothing inherently abusive about tax incentives, provided they support real commercial activity and global business competition. As we have noted above, tax incentives for R&D have proven to be a powerful lever, an example being

[45] Professor Edward Byrne AC submission #1

Singapore's 400 per cent tax deduction on the first $400,000 of qualifying R&D expenditure. Another recent example is the UK's 10 per cent corporate tax rate for "Patent Box" companies. (Other even more favourable IP tax regimes exist e.g. in Luxembourg, the Netherlands and Ireland). There is no reason why Australia should not consider introducing a broader IP regime (i.e. not just patents) with a favourable preferential tax rate.

Intangibles

The movement of intangibles among group companies has been targeted for possible action (BEPS Action 8). The emphasis is on ensuring profits are appropriately allocated in accordance with value creation and that transfer pricing rules are developed for hard-to-value intangibles. This is an area of relevance for investment in innovation.

In summary, any tax reform that targets the digital economy, tax incentives for R&D or the taxation of intangibles has the potential to affect global innovation activities. We support international action to address BEPS. However, we are concerned about the impact on investment (including cross-border flows) and the likelihood of increased compliance costs for Australian companies. Telstra's participation in BEPS debates seek to promote innovation and international competition, but not at the expense of a fair international tax regime.

Any tax reform that targets the digital economy, tax incentives for R&D or the taxation of intangibles has the potential to affect global innovation activities.

4d. Innovation and Intellectual Property

A strong innovation system is sustained by a strong intellectual property system. There is significant risk in investing in a new product only to find it can be easily copied or passed off. Knowing that a product will be protected encourages an innovator to work to produce and protect their asset.

Yet despite the very positive work of the regulator, IP Australia, intellectual property remains a highly specialised and complex area of law that can be confusing for new innovators to navigate. Protecting assets must also take place upfront, requiring costs before any income has been generated, which can be a disincentive to protection.

While Australia has a robust intellectual property framework, changes in technology have moved faster than legislative change and there are challenges being faced by a range of both rights holders and users in the current system.

Australia's patents per capita are less than half the United States.[46] While this is neither a conclusive sign of a failure to innovate nor a conclusive sign of problems with our IP system, it is a symptom of a country that is not leading in the creation of new intellectual property.

Telstra supports copyright laws that promote freedom and flexibility for our customers to store and manage legally acquired content, on different devices, using different technologies, at a time and place convenient to them. We also support the integrity of copyright ownership and licensing regimes, and the rights of intermediaries to legally facilitate access, distribution and storage of copyright materials. The rapid proliferation of digital technologies and devices is challenging the relevance and effectiveness of Australia's copyright laws. At the same time, these innovations are driving compelling offers and solutions for customers and creative opportunities for business.

Australia's numbers of patents per capita is a symptom of a country that is not leading in the creation of new intellectual property.

Telstra has an extensive intellectual property portfolio, including copyright works, trade mark and patent rights in Australia and overseas. At times, Telstra is a rights holder, licensor, licensee, user and intermediary of copyright works, and our customers are enthusiastic consumers of digital content.

[46] McKinsey's competitiveness paper page 34

Telstra is therefore uniquely placed to understand the challenges and opportunities presented by Australia's copyright laws.

Telstra believes a National Innovation Council should be charged with ensuring that Australia has a fair intellectual property system that is clear, coherent, robust and that keeps pace with changes in technology.

There are options in the intellectual property system to support innovate. These include:

Patent Box

Telstra supports the introduction of favourable tax treatment for innovations that are protected by Australian patent rights, in a similar manner to the treatment currently afforded in the UK, which is known as the "Patent Box".

In the UK, companies are able to apply for the lower rate of taxation on the basis that the income is earned from the proceeds of a patent. There are protections to the revenue and only companies earning money from patents are able to apply for this tax treatment.

Introduction of Fair Use provisions

In that environment, Telstra supports the introduction into the *Copyright Act 1968 (Cth)* of a "fair use" exception to copyright infringement. In our view, the significant advantage of a broad fair use exception (particularly when compared with the suite of the current closed, incremental fair dealing exceptions) is its prospective and flexible nature. Fair use, as proposed by the ALRC in its recent report on "*Copyright & the Digital Economy"*, is a principles-based assessment. As such, it provides all stakeholders with a framework for considering specific known, and future unknown, ways of using copyright works.

Patents

Telstra supports reform in the area of software patents and the introduction of both an Innovation Patent System, as well as the insertion of an objects clause in the Patents Act 1990.

Telstra believes it is important that all levels of innovation are encouraged. To this end, we support a second tier patent protection regime for functional inventions that do not meet the inventiveness threshold for a standard patent. The Innovation Patent System has the potential to play an important role in stimulating innovation in Australia, at a range of levels and across different businesses. However, we are concerned that the current threshold test for an Innovation Patent (being "innovative step") is too easy to satisfy. We consider that the threshold for inventiveness required for an innovation patent should be raised to a more demanding level, but should also fall short of the "inventive step" threshold required for a standard patent.

Telstra acknowledges the importance of the patent system in encouraging innovation by providing inventors with a temporary exclusive right to the patented invention in exchange for sharing the details of the invention with the public. Telstra also recognises the important economic and social concerns regarding the scope of inventions that should be patentable.

Telstra supports insertion of an "Objects Clause" into the Patents Act, setting out the underlying purpose of the legislation to provide some assistance to clarify the general principles against which to interpret the detailed legislative provisions. We support an Objects Clause along the following lines: "*The purpose of the patent system is to provide an environment that enhances the well-being of Australians by promoting innovation and the dissemination of technology and by balancing the competing interests of patent applicants and patent owners, the users of technology, and Australian society as a whole*."

Telstra also supports the introduction of an explicit exclusion from patentability for inventions where society would have a moral objection to commercialisation of the invention (e.g. an exclusion for an invention the commercial exploitation of which would be wholly offensive to the ordinary reasonable and fully informed member of the Australian public.) We agree that focusing on the commercialisation of the invention rather than the invention itself is a sensible formulation of a patentability exclusion. In addition, Telstra agrees that the proposed wording is preferable to specific listed exclusions, because

specific listed exclusions lack flexibility to adapt to evolving societal values. Tying the exclusion to the "ordinary reasonable and fully informed member of the Australian public" may facilitate keeping the law in step with community morals, going into the future.

The area of design is particularly important in terms of innovation, as enhancements to the look and feel of products can be an important evolution in a product. The registration of designs is particularly important in Australia, as it may be the only way of protecting the shape and configuration of three-dimensional articles that are intended for large-scale commercial exploitation. The process can be complex and expensive, and has certain limitations (e.g. loss of copyright protection). Australia, unlike the EU, does not have an unregistered design right, which could be of significant benefit.

There is much to recommend the submission of the Australian Design Integration Network and we also agree that "it is clear then that design has an integral role to play in securing Australia's future competitiveness and is a key component of Australia's National Innovation System."[47]

Recommendation 5

The need to fund innovation

Well-functioning capital markets are an essential pre-condition to business investment. Australia benefits from a well-regulated and stable business environment with a range of strong, local financial institutions as well as growing inflows from the superannuation system. However, innovators have criticised the risk aversion of Australia's investors. With notable exceptions, there has, and continues to be, a preference for investment in low-risk assets with stable returns, as opposed to higher risk assets.

Investing in innovation needs to move beyond startups and into longer term support for small companies and firms – by ensuring that R&D expenses can be deducted by *all* Australian companies, government can provide important support for innovation.

Telstra continues to look to invest in innovative companies of varying sizes where these can support the strategy of our company. Through our startup innovator, muru-D, we support selected startups with money, mentoring and a space to grow their ideas. While we are proud of the startups we have helped nurture, and the investments we continue to make in Australian companies, we recognise that no single company can support the nation's innovation agenda on its own.

While innovation will continue to require private sector leadership, there is also a range of early stage capital opportunities that the Australian Government could look to support. This is an area that would benefit from the work of the National Innovation Council.

NESTA is a UK charity, referenced earlier, whose purpose is to support and fund innovation. It helps innovators with early stage investment and intensive researching of ideas to test their potential. NESTA was funded by a government endowment in 1997. Their work in supporting innovators with ideas and money is an important model worth considering for implementation in Australia. Again, the National Innovation Council could study this model and how it could best support innovation research and funding avenues.

[47] Australian Design Integration Network submission #105

Singapore and New Zealand – best practice examples of government funding for innovation

Singapore has low barriers to investment and continues to invest in innovation, both directly and through taxation credits.

Some initiatives Singapore is using to enhance its attraction of innovators and innovative businesses include:

- **Fund matching programs**: Looking to solve the problem of unlocking early capital, the government is providing early stage capital at a ratio of 5:1 so if an innovator is able to raise $100k, the government will provide $500k back on very reasonable repayment terms. There is anecdotal evidence of Australian innovators and startups moving to Singapore to establish their businesses rather than stay in Australia.
- **R&D incentives:** these are amongst the most generous in the world, with significant concessions for companies.

The Ministry for Business Innovation and Employment in New Zealand provides information and assistance to innovators and entrepreneurs. It is action-focused and has sections on finding funders, an accelerator program, an entrepreneur support program, innovation lab and incubator support program. There are a variety of government funding programs, including early stage firms that can access up to NZD $450,000 as a repayable grant for two years.

Telstra believes that the National Innovation Council, or similar body, should be mandated to ensure that international best practice is constantly examined and that recommendations are brought to Australia for consideration.

Crowd Sourced Fundraising

Crowd Sourced Equity Funding (CSEF) is a relatively new form of fundraising for businesses that may otherwise not be able to access capital. In short, a business seeking funds (especially in its formative stages) via CSEF, offers interests in the business to investors online. The Internet plays a central role in CSEF, as interests in the business are typically advertised online through a crowd funding platform.

Investor risks in CSEF are typically higher than other capital raising methods, given the use of the Internet to access a greater number of potential investors[48], who may not be fully aware of the investment risks. Regulatory oversight of CSEF offerings is also an issue, as existing corporate laws in Australia are not tailored to address CSEF, and information provided to investors may be less fulsome than with traditional prospectuses and disclosure requirements. The obligations of a platform provider when offering interests in a business are also the subject of debate.

CSEF has real potential to provide risk capital to startups, and although the current business model for CSEF is challenging, it is the subject of current legislative review and an exciting development area.

[48] CAMAC paper, page 7

IT'S HOW WE CONNECT

Recommendation 6

Governments should actively support innovation via their purchasing decisions

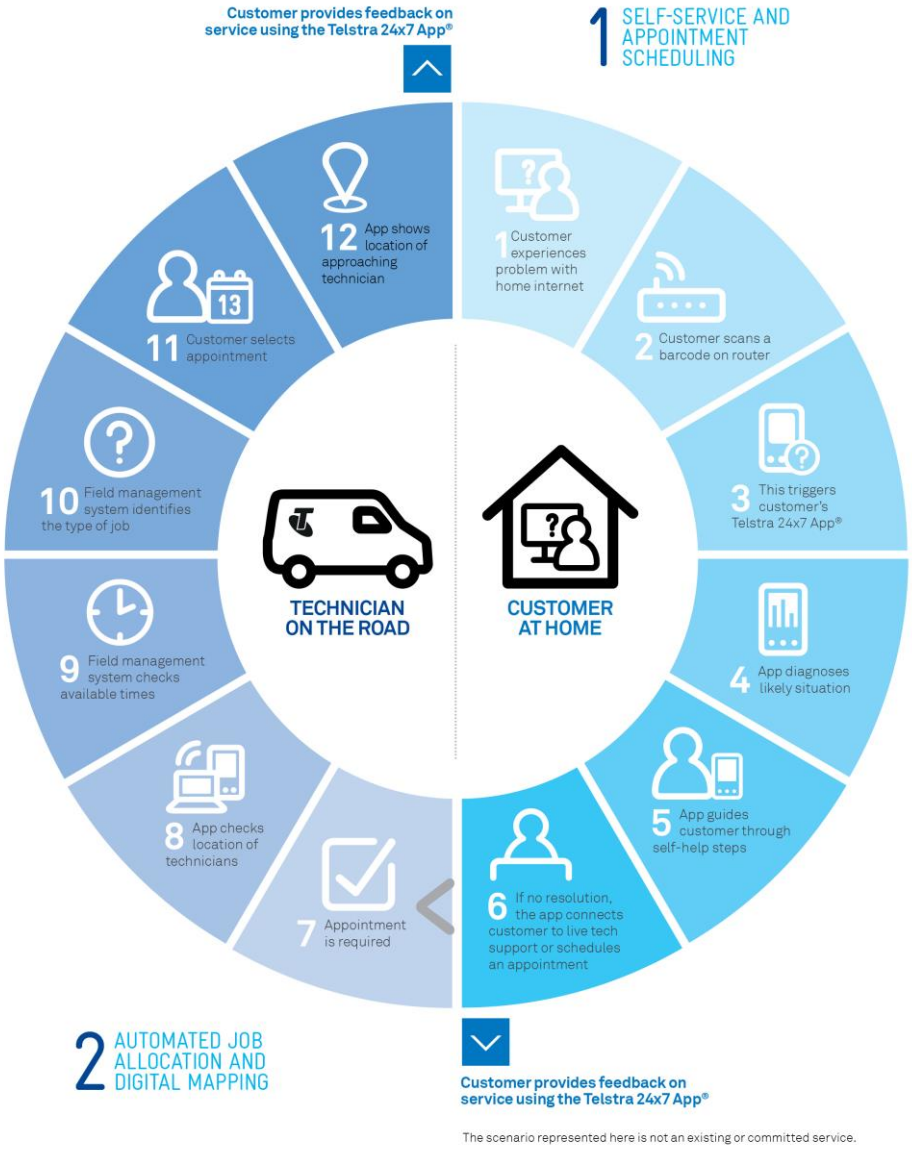
The Australian Government should actively support innovation by advancing the rollout of its Digital First Strategy and actively seeking to role model innovative practice across its operations. State, Territory and Local Governments should also look to continually innovate in their engagement with their community and in their broader operations.

Governments connect with people in many and varied ways and have multiple opportunities to innovate in those interactions. In addition, government's significant budgets for areas as diverse as ICT, buildings and other products and services can be used to leverage best practice in these markets. Through purchasing, promotion and preference, governments at all levels have the ability to support innovation. Contracting and procurement policies should be geared towards supporting an innovation environment, and not just adhere to traditional ways of working.

The Australian Government's support for a Digital First Strategy is to be commended. Initiatives such as moving towards personalised service, offering a digital mailbox, shared cloud services and a commitment to open data are welcome and will make a positive impact on both citizens and the operation of Government. The innovators of Australia should be able to aspire to deliver quality products and services to their government.

While the commitment is to be commended, the delay in the transition to cloud computing among many parts of government – In favour of the up-front purchase and maintenance of servers – is just one example of how existing ways of working need to be addressed as part of government support for innovation.

DIGITAL FIRST EXPERIENCE – EXAMPLE



The scenario represented here is not an existing or committed service.

IT'S HOW WE CONNECT

Summary
Recommendations for an innovative Australia

1. Develop a National Vision to support innovation, and support the establishment of a National Innovation Council.

2. Invest in education and skills
    a. Ensure appropriately trained STEM teachers are available to engage and educate students at a primary, secondary and tertiary level so that they can contribute to the next generation of Australian innovations
    b. Skills – support for visas for overseas innovators.
3. Provide a base level of government funding for research organisations to undertake fundamental research and to enable them to then partner with industry.

4. Ensure government policy supports innovation:
    a. Reforms to allow startups to offer tax-effective employee share schemes
    b. Maintain R&D tax incentives for all Australian companies
    c. Maintain regulatory certainty to support innovation
    d. Support for modernisation of the Intellectual Property (IP) system.

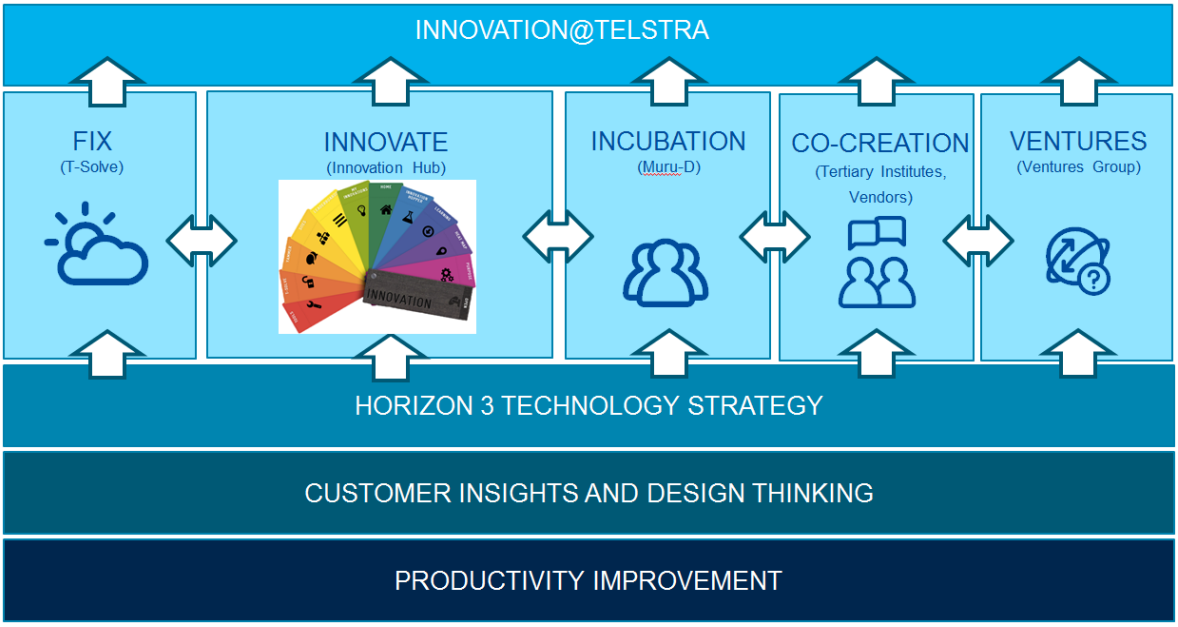
5. Finance innovation effectively – encourage the private sector to provide funding beyond the start-up stage and develop a better functioning venture capital system.

6. Lead by example – ensure government's own operations and actions support innovation:
    a. Implement the Commission of Audit's recommendations
    b. Develop a Digital First approach for each agency
    c. Leverage government's power as a purchaser to support innovative solutions that reduce costs and deliver better services to the community..

IT'S HOW WE CONNECT

Appendix 1
Creating a culture of innovation at Telstra

Telstra is working on an innovation agenda as we continue to position our company for continued strong and sustainable growth. Telstra's innovation agenda is strengthened by the engagement of our customers, vendors, partners and our people.



As there is not a one size fits all approach we have a variety of channels for our innovation work and see each of them as important projects in their own right. Together, they are evidence of our company's widespread commitment to innovation. Our projects currently include:

- **Fix** – our T-Solve platform is an online community where our people seek to fix problems.
- **Innovate** – our Innovation Hub is our online community for innovation. The Hub allows staff to create solutions to problems (internal or customer) and seek internal funding and executive sponsors. We have over 11,000 active users across the company, and over 900 ideas have been submitted many of which have been acted upon and turned into new approaches, products or services. An annual innovation challenge celebrates the idea with the most support.
- **Incubate** – As a concrete way of supporting innovation, Telstra has established an innovation accelerator called muru-D (muru is based on the local Aboriginal world for "path to" and the "D" stands for digital).

  muru-D connects promising startups with some of the best brains in the business while providing the funds, facilities and support to help make their dream product or service a reality. The six-month muru-D program handpicks ten standout startups and gives them $40,000, a world-class workspace and access to expert mentors. They also get tailored training programmes that cover all aspects of how to set up and scale a business. In exchange, Telstra is taking a small stake in the concept.

By harnessing the big ideas any of us can have and supporting the passion behind them, muru-D is designed to encourage digital innovations across a broad range of areas. The aim is to enable start-ups to bring their own unique ideas to life, rather than to influence the ideas themselves. This start up accelerator is a practical way in which Telstra can shares its skills and experience with digital innovators who have ideas but need access to capital and skills.

- **Co-Create** – Telstra's research partner program sees us building relationships with research institutions, such as NICTA, where we work together to apply research, test ideas and potentially build new products and services.
- **Venture** –Telstra Ventures is currently investing in a number of breakthrough companies, both in Australia and internationally. We are actively seeking out opportunities to support new and emerging businesses that can support our future growth and create innovation.

IT'S HOW WE CONNECT

Appendix 2
Australia's innovation success stories

In the early 1990s, the CSIRO invented Wireless LAN (WLAN) technology, an invention that has had such a deep impact on our lives that we hardly give it a second thought. This technology has revolutionised communications across the globe, with an estimated five billion devices worldwide now connected[49].

The CSIRO is currently working a number of initiatives to support health data interoperability and the National e-Health strategy. Australian CSIRO scientists are currently developing innovative new tools for use in electronic health and medical records throughout the country.[50]

The CSIRO has also been responsible for the development and design of enhanced, specialised protective clothing for the Australian Defence Force. The CSIRO developed new, thinner ceramic armour plates that fit better to a soldier's body whilst still providing excellent protection. The new design has cut production costs by more than 50 per cent and improved safety.[51]

University of Melbourne Professor Graham Clark and his team researched and successfully developed the first bionic ear, with the first implant being inserted in 1978. This revolutionary product was the first sensori-neural prosthesis to effectively and safely bring electronic technology into a direct physiological relationship with the central nervous system and human consciousness.[52] The idea, with commercialisation support from the Commonwealth Government, became Cochlear – now an international leader with 60 per cent of the world's market share for hearing implants.

Following the 2002 Bali bombing, West Australian plastic surgeon Dr Fiona Wood successfully developed spray-on-skin. This allowed for the rapid administration of skin cells, which sped up the healing process and significantly reduced scarring on burns victims. Previous attempts at this had meant skin cells took twenty-one days to turn over, whereas this new design reduced the turnover period to just five days.[53]

[49] CSIRO 2013, *Wireless technology having profound global impact*, Australian Government, accessed 15 August 2014, <http://www.csiro.au/Outcomes/ICT-and-Services/People-and-businesses/wireless-LANs.aspx>

[50] CSIRO 2014, *Advancing Australia's e-health agenda*, Australian Government, accessed 15 August 2014, <http://csiro.au/Portals/About-CSIRO/What-we-do/Impact-case-studies/ClinicalTerminology.aspx>.

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