

Business
Council of
Australia



Submission to the Senate
Economics Reference
Committee Inquiry into the
Australian Innovation System

SEPTEMBER 2014

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The Business Council of Australia is a forum for the chief executives of Australia's largest companies to promote economic and social progress in the national interest.

Executive summary

A mindset change is needed

If we are to unleash Australia's capacity to grow and prosper in an increasingly competitive global environment, a mindset change is needed in how government conceives of innovation, and how it mobilises the system that underpins it to create a more agile, creative and competitive economy.

Innovation is not a program that can simply be delivered. It is the outcome of a thoughtfully designed system that builds and supports the nation's capacity to innovate, while encouraging the demand for innovation to occur.

Innovation is defined by the Business Council of Australia as the application of knowledge and technology to create additional value. Innovation can be incremental, or it can be transformational. At its core, demand for innovation is driven by the need to find solutions to problems.

The approach to innovation by successive governments has been ad hoc and narrowly focused, primarily on science, research and development. It has ignored or overlooked how the innovation system operates overall.

The Senate Economics Reference Committee Inquiry into the Australian Innovation System is an opportunity to focus attention on the critical importance of innovation to growing the Australian economy, improving living standards and creating the jobs of the future.

It provides an opportunity to promote bipartisan agreement around a set of core principles to guide a new approach to innovation in Australia.

These principles should reflect a shared understanding of what makes an innovation system effective, and the multiple, interconnected government policies involved in delivering it.

It is time to move beyond the continual redefining and researching of innovation. It is time for action.

The imperative for innovation

Innovation is essential to achieve the next wave of growth and investment in the context of significant global forces of change.

In its 2013 *Action Plan for Enduring Prosperity*, the Business Council identified innovation as a key area Australia has to get right to achieve sustained economic growth.

A subsequent discussion paper, *Building Australia's Comparative Advantages*, reinforces that innovation is at the heart of building the competitiveness of important existing and emerging sectors of our economy.

Our strong premise now is that innovation can no longer be viewed as an adjunct to economic policy and growth. It is central.

Over the past two decades, the Australian economy has grown at an average annual rate of 3.4 per cent. These growth rates have been achieved on the back of substantial economic reforms from the 1980s and 1990s that opened our markets and increased productivity. From 2004, Australia's unprecedented terms of trade kept our economy growing strongly.

Driving growth over the next decade will be far more difficult.

Sustaining an annual rate of 3.4 per cent will require extraordinary policy effort.

The 2010 *Intergenerational Report* (IGR) projects real GDP growth to slow to an average of 2.7 per cent a year for the period through to 2050. Assuming that participation and population projections are borne out, achieving economic growth of 3.4 per cent would require labour productivity growth of 2.4 per cent per annum.

According to the 2014–15 Commonwealth Budget, the long-run rate of labour productivity growth is just 1.5 per cent per year.

Analysis covering the 10 years to 2005 showed that almost two-thirds of Australia's productivity growth was driven by innovation. A key determinant in lifting our productivity performance going forward will be how effectively we unleash innovation.

This is why the Business Council of Australia asserts that the next decade of economic growth must be innovation led.

In the context of a rapidly changing world, it is only through this innovation-led growth, as well as the supporting innovation infrastructure, that we will be able to drive job creation into the future.

In the same way that innovation can be a source of comparative advantage for businesses, mobilising our innovation system can be a source of comparative advantage for Australia.

It is time to act

There is a considerable body of work on innovation in Australia, including:

- *Australia's Innovation Imperative* (Deloitte, 2014)
- *The Startup Economy: How to Support Tech Startups and Accelerate Australian Innovation* (PWC, 2013)
- *Reinventing Australian Enterprises for the Digital Economy* (IBM, 2013)
- *The Australian Innovation System Report* (Australian Government, 2010–2013)
- *Digital Disruption* (Deloitte, 2012)
- *The National Digital Economy Strategy* (Australian Government, 2011)
- *Powering Ideas* (Australian Government, 2009)
- *Venturous Australia: Building Strength in Innovation* (Terry Cutler, 2008)
- *New Concepts in Innovation* (BCA, 2006)

- The National Innovation Summit (2000).

Undertaking further studies or re-prosecuting outdated arguments about innovation is not what is needed now.

What’s needed is the courage to take action.

In making this submission, the Business Council has outlined a series of recommendations which are practical and implementable. We hope that the committee will both recognise and endorse these recommendations.

A systems approach to innovation is needed

Innovation occurs in the context of a broader innovation system. To drive innovation, we need to recognise this and ensure that:

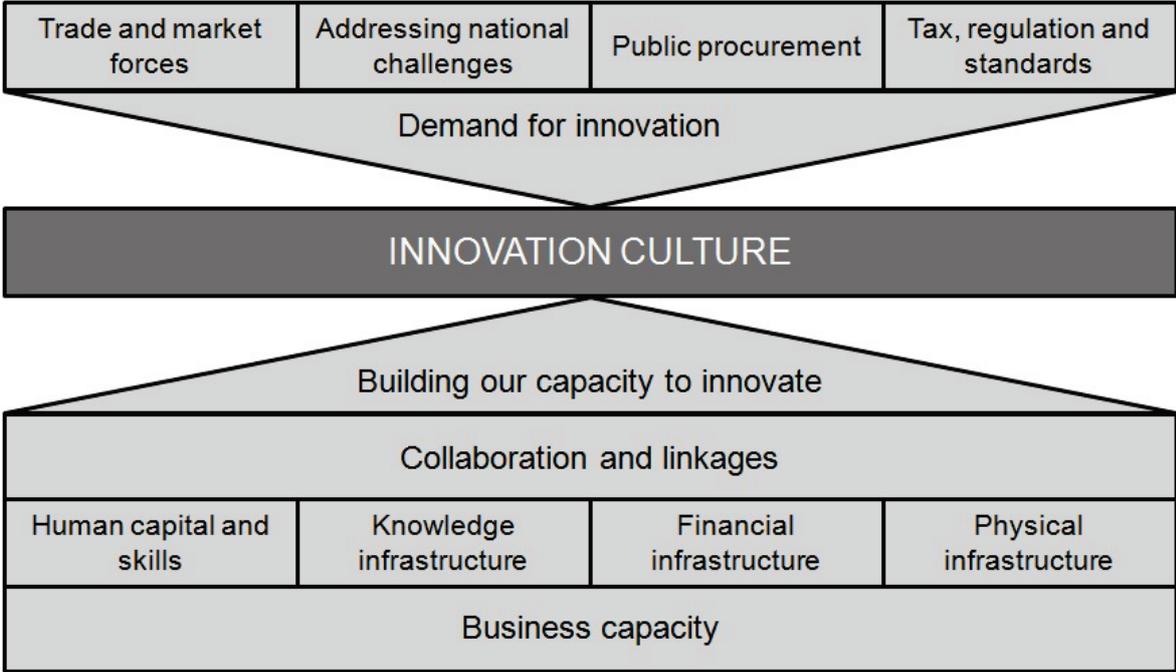
- all parts of the system are in place
- the parts of the system are aligned
- the system is mobilised to achieve national objectives.

Figure 1 illustrates key elements of the Australian innovation system. All of the areas presented in the boxes are policy amenable.

The triangles display two important dynamics. Innovation happens at the intersection between the capacity to innovate and the demand for innovation that flows from the need to solve a problem.

This is why mobilising the system requires us to focus on both building the capacity to innovate and increasing demand for innovation.

Figure 1: Business Council diagram of the Australian innovation system



Source: Business Council of Australia, 2014

Building capabilities and incentives to support an innovation system

Government controls many of the levers and much of the infrastructure which contribute to the national innovation system.

This includes skills and education (human capital), research and development (knowledge infrastructure), physical and technological infrastructure, and our tax and regulatory settings.

In combination, these levers influence our capacity to innovate and also the incentives which reward innovation.

Government itself needs to innovate

Government has a substantial footprint on the Australian economy, with government spending responsible for 34 per cent of Australia's GDP.

This requires government to be innovative in improving the effectiveness and value of service delivery.

Where government embarks on major pieces of reform, it should seek and articulate an innovation dividend.

Government must also recognise the significance of its role as a customer, and its responsibility to demand innovation in the products and services it procures.

For example, major projects such as the National Broadband Network (NBN) or new defence contracts provide the opportunity for government to factor in an innovation dividend into its up-front decision making, rather than opting exclusively for the lowest-cost alternatives.

Five elements of change

To mobilise Australia's innovation system, the Business Council has identified five critical areas for action:

- Creating an environment and culture that incentivises innovation and enables risk taking. This includes the broader business environment as well as using government procurement to drive innovation across the economy.
- Collaboration. This includes drawing on external expertise, and sharing information, knowledge and experience to leverage opportunities in a globally connected world.
- Human capital and skills. This includes educating and training our citizens to think creatively, to problem solve and to apply their skills productively.
- Knowledge infrastructure. This includes providing support for institutions and organisations which create and renew knowledge, and ensuring that knowledge is disseminated so that it can be leveraged, translated and practically applied.
- Regulation. This includes assessing current regulation on whether it discourages investment in innovation, or undermines the ability of firms and individuals to take risks or adapt to changing market circumstances.

Recognising the complex interconnection of policies involved in the innovation system and the need for a whole-of-government approach, innovation should be specifically considered in the context of important current and planned government reviews and processes, including the Tax Reform White Paper, the Financial Systems Inquiry, the White Paper on the Reform of the Federation, and the Productivity Commission Inquiry into Workplace Relations.

1. The innovation imperative

The Business Council's *Action Plan for Enduring Prosperity* identified innovation as one of nine areas Australia has to get right if we are to secure lasting community prosperity in a context of fundamental and ongoing structural change.

Building on this work, the Business Council released *Building Australia's Comparative Advantages* in July this year. This paper analysed the factors affecting Australia's competitiveness on a sectoral level. The work reinforced the critical role of innovation in:

- maximising the comparative advantages of existing and emerging sectors
- enabling the transition of less globally competitive sectors of the economy into other areas of the new global value chain
- improving the quality and affordability of government service delivery.

In developing the Business Council's work program on innovation, we commissioned a report from Deloitte. That report, *Australia's Innovation Imperative*, is attached to this submission.

The common theme across each of these reports is that innovation is critical to Australia's future economic growth.

The importance of innovation to economic growth

Over the past 20 years, the Australian economy has grown at an average annual rate of 3.4 per cent. This growth has been unambiguously good for business, for job creation and for living standards.

Maintaining this rate of growth depends on whether Australia can vastly improve on its productivity performance over the last decade.

Analysis contained in the *Australian Innovation System Report 2011* showed that innovation accounted for almost two-thirds of Australia's productivity growth.¹

It should be of considerable concern that Australia is ranked 17th out of 143 countries according to the Global Innovation Index.

To drive another decade of economic growth at the rate we need to repay government debt while reinvesting in education and skills, our physical and knowledge infrastructure, the environment and our social safety net will require significant effort.

¹ Department of Innovation, Industry, Science and Research, *Australian Innovation System Report*, 2011.

We will only do it by lifting Australia's global innovation ranking to where it can and should be among the top five countries in the world.

Context for innovation

The forces shaping our economy and our world are different from the forces at work over the past 20 years:

- Digital technology is making almost every sector tradeable, and the market for labour global.
- The acceleration of technological change and disaggregation of supply chains is intensifying global competition.
- Countries are facing significant global challenges, including climate change, urbanisation and increasing demand for limited natural resources.
- Global economic shifts are causing countries around the world to re-evaluate their approach to economic growth. Nations at all levels of development are strategically building on their comparative advantages.
- Demographic changes will make it increasingly difficult for governments to balance their budgets while maintaining social wellbeing.

While these forces are not new, the pace, scale and global nature of change is unprecedented.

Realising Australia's potential to embrace change to achieve enduring community prosperity will involve an unprecedented level and standard of innovation.

2. Defining innovation

There are different definitions and interpretations of what constitutes innovation.

The Business Council defines innovation as the application of knowledge and technology to create additional value.

Innovation can involve the creation of new products and services, improving existing products and services or applying business systems and models in new ways.

Innovation can be either incremental or transformational.

Importantly, innovation implies that value is created. It must create benefits, whether privately through commercialisation or through the creation of public goods.

Demand for innovation is created from the need to solve problems, whether scientific, social or commercial.

Our preference is to adopt a wide definition of innovation to acknowledge that innovation occurs in multiple ways across the entire economy through the actions of government, organisations, businesses and individuals.

The wide definition recognises that innovation is broader than just research and the application of technology. Innovation is also fundamentally about the creation of new products and services, improving existing products and services, and applying business systems and models in new ways.

Recommendation 1 – Defining innovation and innovation systems

The Senate inquiry should adopt a broad definition of innovation, and innovation systems, consistent with the definitions outlined in this submission.

3. Mobilising the Australian innovation system

Both the capacity of individuals and organisations to innovate, along with drivers of demand for innovation, are heavily influenced by the broader innovation system, which is the focus of this inquiry.

There are many different interpretations of what is meant by an ‘innovation system’.

The Business Council supports a broad concept of an innovation system, which incorporates factors that affect our capacity to innovate and factors that drive demand for innovation.

An innovation system is a network of individuals and organisations that act and interact within a broader environment. This system leads to the creation, development and diffusion of fresh ideas that create value – economic, social and environmental.

This system approach is well acknowledged in the academic literature and in many private reports, including Deloitte’s *Australia’s Innovation Imperative* and Microsoft’s *Joined Up Thinking*.

Mobilising the Australian innovation system requires a continuous, whole-of-government approach.

We need to establish an appropriate national institution to focus, facilitate and coordinate this.

Recommendation 2 – Institutions to drive a systems approach***National Innovation Council***

The inquiry should recommend the establishment of an independent National Innovation Council as a means of delivering a more continuous and consistent approach to innovation across the whole of government.

The operation of the council should be reviewed every two years.

The council would be responsible for identifying national innovation priorities, where outcomes would have the greatest impact in mobilising the Australian innovation system.

The council should also be responsible for:

- Improving policy alignment within the system.
- Identifying gaps.
- Promoting policy consistency over time. Where policy changes are proposed, it would recommend and oversee transition arrangements.

4. Integrating the innovation agenda into other reviews and processes***Issue***

We need to promote a more systematic, whole-of-government approach to innovation. This approach should recognise the complex policy interdependencies within the innovation system. As a result, innovation needs to be integrated into significant government reviews which are planned or underway.

The question that needs to be addressed as part of each of these reform processes is whether a potential policy change will help or hinder innovation.

While this is not the only question to consider, it is one that is not currently being asked, and the effectiveness of our innovation system has suffered as a result.

Current and upcoming reviews which should actively consider innovation include the:

- Tax White Paper
- Financial System Inquiry
- White Paper on the Reform of the Federation
- Productivity Commission Inquiry into Workplace Relations.

Tax White Paper

Taxation settings are a key determinant of the business environment, and influence the incentives for businesses to invest in capital, labour, technology and research and development.

The upcoming Tax White Paper process should explicitly consider how the current landscape and any potential changes impact our ability to innovate. This should include consideration of actions to ensure that the taxation environment provides incentives for innovation.

Australia's current corporate tax rate is not internationally competitive. For example, a major factor in the recent decision by CSL to locate its manufacturing operations in Switzerland rather than Australia was the difference in the corporate tax rate.

Academic studies suggest that lower company taxes result in increased investment, particularly foreign investment which can have spillover benefits in terms of knowledge diffusion.

Lowering the corporate tax rate can also lead to increased entrepreneurship.

The 2008 Cutler review of the Australian innovation system concluded that: "there would be a substantial economic growth and innovation dividend from reducing Australia's rate of company tax".

Financial Services Inquiry

Access to capital is the most cited barrier to innovation for innovation-active businesses.² A robust and effective financial system is critical to providing the finance necessary to invest in innovation.

The Financial Services Inquiry currently underway should consider the potential impact of its recommendations on the funding of innovation and risk taking by Australian businesses.

Regulatory and taxation impediments, while referred to in the interim report, need be more fully explored in the final report as they have a disproportionate impact on small to medium sized businesses which are central to driving innovation and employment.

Opportunities to grow lending to small and medium enterprises should be identified, especially where there are regulatory or taxation impediments that add to costs (financial, transaction, commercial, prudential, etc.).

The system must be better able to fund businesses and individuals to take the kind of risk that is at the core of innovation and enhancing productivity. Policy advice from the inquiry related to information asymmetries, transaction costs and risk models associated with business loans would be of significant value.

² ABS, *Selected Characteristics of Australian Businesses*, cat. no. 8167.0, 2011–12.

White Paper on the Reform of the Federation

Mobilising national markets and the national innovation system requires policy change in areas involving significant interplay between the federal and state/territory governments. This includes lifting national skills and reducing regulatory costs and barriers.

The White Paper on the Reform of the Federation should specifically look to the impact of federal–state arrangements on the national innovation system.

Productivity Commission Inquiry into Workplace Relations

This inquiry will need to come to terms with what is required to prosper in a modern business environment that places a premium on the need for collaboration, agility and flexibility. If innovation is to flourish to the extent required in Australia, facilitating the development of workplaces of the future should be at the heart of this inquiry.

Recommendation 3 – Integrating the innovation agenda into other reviews and processes

The committee should recommend that innovation be considered as part of current and planned reviews and processes, including the Tax Reform White Paper, the Financial Systems Inquiry, the White Paper on the Reform of the Federation and the Productivity Commission Inquiry into Workplace Relations.

These reviews and processes have a huge role and responsibility in recognising the impact and interconnection of policy in the context of Australia's national innovation system.

For those processes not yet underway, their terms of reference should specifically identify innovation system objectives.

5. The five elements of change

5.1 Creating an environment and culture that incentivises innovation and enables risk taking

Issue

Business has a major role to play in the innovation system. This can be either encouraged or impeded by the environment and the culture in which businesses operate.

The challenge, and opportunity, for this Senate inquiry is to provide recommendations that will make a positive contribution to creating an environment which is more conducive to a culture of innovation in Australia.

Such recommendations should focus on creating a framework which provides incentives for innovation, and which enable and encourage appropriate risk taking.

The Business Council is concerned that innovation is being stymied in Australia by a culture which is overly risk averse.

Culture matters because it influences the patterns of behaviour of individuals. Are new ideas welcomed or discouraged? Are individuals and businesses encouraged to take appropriate risks that could result in beneficial payoffs?

An Australian Government adaptation of a Booz & Company study found that 44 per cent of businesses internationally had a 'highly aligned innovation strategy and innovation culture'. When this methodology was applied in Australia, it was found that only 18 per cent of businesses met this criterion.

Creating a culture of innovation in any organisation, whether business or government, should not be considered an add-on. It should be seen as a fundamental way of working and thinking.

Government itself must be an exemplar of this by becoming more innovative in its service delivery and by driving innovation through being an appropriately demanding customer.

Recommendation 4 – Incentivising innovation and enabling risk taking

The committee should recommend actions that will facilitate a business culture of innovation. These recommendations should focus on creating a business environment which allows organisations to respond to change in an agile manner, and which provides appropriate reward for risk.

This should include:

- More thoughtfully designing the Entrepreneurs' Infrastructure Programme to address the need for greater global orientation, collaboration and access to talent in firms, and to ensure that it supports risk taking.
- Amending the tax treatment of employee share schemes so that the point of taxation is when the share, or rights, are exercised.

Recommendation 5 – Government driving innovation in its own operations

The committee should recommend actions for government to create a culture of innovation in its own operations, processes and service delivery.

This could include:

Government competition

- Subjecting more government services to competition and contestability, particularly in areas such as health and education.

Application of technology

- Managing innovation through technology, the greater use of data, and enhanced data analytics capabilities.
- Driving innovation in service delivery through a 'digital first' policy aimed at increasing the government's use and application of information and communications technology (ICT) in the public sector.

Benchmarks

- Establishing benchmarks for the application of technology in government, based on how Australia compares with best practice in other countries, and then tracking progress annually in meeting improvement milestones.
- This could include regularly reporting on progress in achieving the government target of having 80 per cent of engagement with government take place on the internet or through other online services by 2020.

Government as a demanding customer

- Consideration of how public procurement can be used as a tool to drive innovation, such as by adopting a more strategic approach based on outcomes and value for money, rather than cost per unit.
- Government acting as a demanding customer and increasing its expectations around the level of quality, service, cost and innovation that it seeks from service providers.
- The adoption of a model, such as the United States' successful Small Business Innovation Research (SBIR) program, to drive engagement with SMEs in government-funded research.

5.2 Collaboration

Issue

Innovation systems are about networks of individuals and organisations that act and interact within a broader environment. Innovation does not happen in a vacuum. That is why collaboration is a critical component of the Australian innovation system.

Collaboration is not an end in itself. Collaboration is important because it allows the involved parties to not only share knowledge and resources, but also share the inherent risk associated with innovation. It is also important for knowledge diffusion.

Collaboration can occur between different types of participants in the Australian innovation system, such as between business and research institutions. It can also occur within participant groups, for example between small and large businesses. It can also occur internationally.

ABS data shows that innovation-active businesses are more than three times more likely to collaborate than those that are not innovation-active.

However, the level of collaboration between research and business in Australia continues to compare poorly with other OECD countries. According to the World Economic Forum's 2013–14 Global Competitiveness Index, Australia ranks 15th on university–industry collaboration around research and development.

To address this weakness, Australia needs to rebalance some of the fundamental incentives in the system to have a more industry-oriented approach.

The UK's Catapult Centres provide a best practice example of creating physical centres where businesses, scientists and engineers work side by side on late-stage research and development (see Appendix 1).

Recommendation 6 – Addressing the incentives of researchers to collaborate with industry

We need to rebalance our research efforts from being predominantly investigator-led to include a greater share of industry-led research.

To facilitate this, the committee should recommend that changes be made to the criteria used to allocate funding to publicly funded research organisations, particularly via the Excellence in Research for Australia (ERA) initiative. While research excellence should remain at the heart of funding allocations, collaboration with industry should also be appropriately recognised.

For example, this should include consideration of the Australian Academy of Technological Sciences and Engineering (ATSE) proposal to develop an 'impact and engagement for Australia' metric that would sit alongside the ERA assessment.

The committee should also support increased funding for the government's successful Researchers in Business Program, which directly drives collaboration between researchers and industry.

Recommendation 7 – Enhancing the application and commercialisation of knowledge

To assist in translating research into practical application, the committee should recommend that government look to emulate the UK's successful innovation program to develop areas of the economy where Australia has potential comparative advantages, such as mining services, gas and energy, or niche manufacturing industries.

National ICT Australia (NICTA) provides an example of an existing model capable of translating research into application by bringing together industry and research to tackle real-world problems.

In an Australian context, the design of such programs should focus on enabling collective responses to real industry needs and issues, both in the long term and as issues arise. For this reason, they should be industry led and not owned or constrained by government.

5.3 Human capital and skills

Issue

Technology, reduced barriers to trade and the rapid development of emerging economies are fundamentally changing the nature of jobs and work.

Connectivity is enabling individuals to offer their services at a distance, rapidly increasing competitive pressures on businesses and individuals.

For an advanced economy like Australia, our innovation capabilities (managerial, creative and technical) provide us with the ability to realise these changes as opportunities to drive economic growth and community prosperity.

This means ensuring that Australians have first-class capabilities and skills, that Australia remains a destination of choice for the world's most talented individuals and that businesses are able to effectively harness these talents.

In an increasingly globally connected world, our human capital will underpin our ability to differentiate ourselves from others and to value add. Indeed, capabilities and skills, and how they are formed and regulated within the labour market, will increasingly define national competitiveness and provide the best opportunity to grow employment.

At present, the level of management skills and capabilities represents a significant gap in the Australian innovation system. The report *Management Matters in Australia: Just How Productive Are We?* found that Australian managers in manufacturing lagged behind their international counterparts in most of the 18 dimensions analysed.

The Business Council's *Action Plan for Enduring Prosperity* outlined a comprehensive set of recommendations to lift the foundational skills of students graduating from compulsory education and to enable workplaces to improve on productivity.

Government needs to ensure that our education and training systems provide citizens with the capabilities to think creatively, to innovate and to apply their skills productively.

This can include technical skills in science, technology, engineering and mathematics (STEM), and ICT, as well as the broader skills such as adaptability, problem solving and creative thinking which are necessary to the ability to innovate.

The vocational education and training (VET) sector must be recognised as having an essential role in retraining people over a lifetime, enabling them to move from lower to higher value jobs, or move between occupational categories as the economy restructures, and providing foundation skills to people who have been let down by the primary and secondary school system.

Recommendation 8 – Creating the STEM capabilities for the future

National STEM Strategy

The committee should support the implementation of the National STEM Strategy called for by the Chief Scientist of Australia. This will enable a whole-of-government approach to coordinating STEM policies, prioritising public investment and adopting an incentive structure that encourages growth in business investment.

This should include:

- Recognising software capability as a foundational skill and introducing computer coding as a compulsory subject in the national curriculum.
- Ensuring that secondary school mathematics and science are taught by qualified subject matter specialists.
- Introducing specialised teachers in mathematics and science into all primary schools.
- Supporting programs such as Primary Connections which provide innovative means of teaching and learning about science.

Recommendation 9 – Developing our foundational skills

To ensure every Australian child receives foundational skills at school, and to address current literacy and numeracy deficiencies in school students, the committee should recommend that as a condition of Commonwealth funding, state governments should require that primary students meet minimum standards before entering secondary school.

Recommendation 10 – Recognising the role of skills and the VET system in driving innovation

In recognition of the important role of the VET system in driving increased innovation, the committee should:

- Articulate support for the role and status of VET to be restored as a national priority.
- Support the Commonwealth and state governments commissioning a thorough assessment of the future investment requirements of VET, including:
 - population growth projections
 - workforce requirements
 - the implementation of the VET student entitlement
 - a view to providing consistency across the federation and ensuring adequate support for projected needs for VET-qualified workers.
- Support trial programs in each jurisdiction, based on the US PTech model (which uses work-integrated learning to teach science and mathematics skills, along with problem solving and inquiry, to school students who are put to work on real-world problems) and similar state government programs aimed at providing a better pathway between school education, VET and work.

Recommendation 11 – Improving access to international talent

To facilitate greater access to human capital and expertise in a globally competitive marketplace, the committee should:

- Restore access by international researchers to Australian research fellowships.
- Support changes that would make the 457 visa scheme more efficient by abolishing labour market testing and streamlining 457 visa processing for accredited 457 visa sponsors.

Recommendation 12 – Improving managerial capabilities

The committee should recommend actions that will contribute to improving managerial capabilities in Australia. These could include:

- In line with the recommendations of the Future of Management Education report, that business schools need to:
 - Deepen their collaboration with business to develop innovative models that are ‘experiential’ and relevant and promote the interaction of business and society.
 - Develop, in collaboration with partners, leading-edge management intervention programs that combine analytical and integrative or design thinking, and which use technology and online resources for award programs and executive education.
 - Recognise that graduate attributes can no longer be confined to areas of specialised knowledge.
- That the VET sector can contribute to improving managerial capability through incorporating management capabilities across VET qualifications.
- Consideration of building on the success of initiatives such as the Australian Design Integration Network (ADIN), which provides practical support to managers to utilise design thinking as a management technique.

5.4 Knowledge infrastructure**Issue**

Our knowledge infrastructure plays a critical role in both creating new knowledge and in disseminating it to other participants in the Australian innovation system so that it can be translated and practically applied.

Elements of knowledge infrastructure include:

- Government funding programs such as the Australian Research Council (ARC) and the National Health and Medical Research Council (NHMRC), which provide support for research to be undertaken.
- Organisations such as the Commonwealth Scientific and Industrial Research Organisation (CSIRO), universities and research centres which are responsible for generating new ideas.
- Bodies which seek to translate knowledge into practical commercial application, such as NICTA.
- Data which is accessible and available for people and organisations to leverage as a platform to drive innovation.

NICTA's own submission to this Senate inquiry provides an explanation of the elements of knowledge infrastructure and how they interact with each other.

Evidence demonstrates that investment and funding of basic research contributes positively to long-run innovation outcomes. We need to ensure that we continue to invest in growing our stock of knowledge, which takes time to develop.

We also need to streamline processes and timelines involved in applying for funding grants. This issue has been repeatedly identified as a drag on innovation, it reflects a huge leakage in the system and yet it remains unaddressed.

Research is not something which can be turned off and quickly turned back on. It needs consistent and long-term support.

Recommendation 13 – Aligning our research effort to support our comparative advantages

The committee should agree that given our limited resources, Australia should seek to concentrate support for research and development on areas where it can contribute most effectively to our national interest. This includes facilitating growth based on Australia's current or nascent comparative advantages.

The Business Council's paper *Building Australia's Comparative Advantages* identified sectors in which Australia can compete at a global scale. These sectors include mining and liquefied natural gas, agriculture, tourism, food manufacturing, some niche, highly differentiated manufacturing, international education and medical technologies.

Accordingly, the ARC Strategic Research Priority associated with 'lifting productivity and growth' should be used to direct funding towards these areas.

Recommendation 14 – Building platform capabilities in software and ICT

The committee should agree that our capabilities in software and ICT will provide a platform that can underpin the ability to innovate in all sectors of the Australian economy through, for example, automation, data analytics, optimisation and trusted software.

The committee may wish to explore whether Australian research in quantum computing could underpin this capability and, if so, how this capability could be fostered.

Recommendation 15 – Ensuring funding timeframes reflect the long-term nature of research

The committee should take evidence and make recommendations on:

- How to better align funding timeframes for publicly funded research to reflect the long-term nature of research.
- How to streamline the application process for grants and funding to minimise leakages within the innovation system.

5.5 Regulation***Issue***

Unnecessary or poorly designed and administered regulation places unnecessary and costly burdens on individuals and businesses, and inhibits innovation. On the other hand, sensible standards and regulation can stimulate innovation.

While Australia has well-respected regulations by international standards, our regulatory burden remains high and this serves as a barrier to innovation.

In an increasingly globalised economy, poor or excessive regulation can weaken competitiveness, and poses the risk of businesses relocating to take advantage of more favourable regulatory circumstances.

For example, it recently took Cochlear, an Australian-based exporter of medical devices, 14 months longer to gain product approval in Australia than in Europe.

A number of countries require a device to be approved in its country of origin before it can be approved for use in the export destination country. After obtaining regulatory approval in Europe, it took an additional 14 months before Cochlear could even start to apply for product registrations in other key markets.

Regulations need to be monitored to ensure that they reflect the current operating environment, while maintaining appropriate protections. Care needs to be taken to ensure that regulation, whether existing or new, does not unwittingly stymie innovation.

In designing regulations, government needs to consider their impact on innovation. A commitment to regulatory best practice should be made unilaterally, and strictly adhered to.

The competition policy review presently underway is an opportunity to ensure Australia's competition laws take account of globalisation and the dynamics of markets.

Getting this right is important for establishing a regulatory environment that supports business innovation. Over-application of the Competition and Consumer Act impedes the ability of businesses to respond to changing market conditions and efficiently deliver products and services that consumers value.

Recommendation 16 – Competition policy that recognises the role of dynamic global markets

The committee should recommend that the Competition and Consumer Act be amended to clarify that in any competition assessment, the global dimension of markets must be taken into account. Dynamic, competitive effects in markets are to be preferred over static measures such as historical competition.

Recommendation 17 – Implementing national productivity payments to drive innovation

The committee should endorse the Commonwealth Government putting in place institutional arrangements to drive competition and regulatory reform at the state level. This should include a system of productivity payments that incentivise reforms which materially improve national productivity.

Priorities for reform could include:

- Australia's governments setting a timetable and process for aligning state-based retail trading hours, and coordinating a state-based reform agenda for removing the most restrictive and inconsistent regulatory restrictions affecting the retail sector. This will assist in allowing the retail sector to respond to the digital disruption impacting it.
- Implementing measures to deliver more timely and predictable decision making regarding planning, zoning and other land development, underpinned by a suite of reforms that involves all states and territories.

Recommendation 18 – Reducing unnecessary regulatory burden

Australian governments should adopt the principle that where a regulated good or service is tradeable, and subject to a regulatory approval by a European Union, a US, or Canadian national regulator, there should be a strong presumption in favour of automatic recognition of those countries' approval processes. Individual Australian jurisdictions should be prepared to adopt this principle unilaterally.

The principle should be applied to legislation such as the Therapeutic Goods Act and regulation such as the Therapeutic Goods Regulations.

Appendix 1: Catapult networks

The UK has developed 'Catapult networks', which are designed to transform the UK's capability for innovation in seven specific areas and help drive future economic growth. The seven areas are high-value manufacturing, cell therapy, offshore renewable energy, satellite applications, connected digital economy, future cities and transport systems.

The Catapult networks are a series of physical centres where the very best of the UK's businesses, scientists and engineers work side by side on late-stage research and development, transforming high-potential ideas into new products and services to generate economic growth.

The funding model will vary through the life of the technology and innovation centre and can be expressed in simplified terms as following the one-third, one-third, one-third model. Under this model, centres are required, when fully established, to generate their funding broadly equally from three sources:

- Business-funded R&D contracts, won competitively.
- Collaborative applied R&D projects, funded jointly by the public and private sectors, also won competitively.
- Core public funding for long-term investment in infrastructure, expertise and skills development.

Each Catapult centre is its own separate legal entity, controlled by its own board with an executive management team responsible for day-to-day management.

Source: <https://www.catapult.org.uk> and <https://www.innovateuk.org>

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