Making the right connections across Australia's innovation ecosystem to support our future growth and international competitiveness.
Welcome

I’m delighted to present Joined-Up Innovation – a new approach from Microsoft and some of the nation’s leading experts aimed at accelerating innovation in Australia.

As someone with hopes and dreams for my two children growing up in Australia, I take discussion about our nation’s future prosperity and resilience both seriously and personally. What will our economy look like in another 10 or 20 years? Where are my kids – or yours – going to find purposeful, interesting and high-value work?

It’s true Australia has amazing strengths, from our natural resources to our location in the fast-growing Asian region; economic and political stability; cultural diversity; and a smart, inventive population. However, we also live in a very competitive world and will have to work hard to maintain and improve our position. A key part of achieving that will be our capacity to innovate.

This discussion paper presents a vision for what we call Joined-Up Innovation. We believe Australia can improve its ability to create innovative, high value-producing businesses by ensuring that all elements of its innovation ecosystem are better informed and better connected locally and globally.

We also believe it’s vital to consider the full spectrum of innovation, including high-tech start-ups looking to take on the world, and the more than 1 million established Australian businesses that could be creating and using the latest tools to enhance their competitiveness.

Most importantly, we argue that we need to reframe the way we think about innovation because the world has changed significantly and will change even more in the future. It’s not just that the goalposts have been moved – we’re playing on a whole new field.

Pip Marlow
Managing Director
Microsoft Australia
INTRODUCTION
We are often told that innovation is the lifeblood of modern economies. But what does innovation really mean, and how do we ensure we’re not only good at innovation but internationally competitive?

To grapple with these questions, Microsoft recently brought together a panel of experts from across our innovation ecosystem. We were particularly interested in their views on how to drive better connections between all the parties that make up our complex innovation ecosystem – including entrepreneurs, businesses, consumers, investors, academics and researchers, and governments.

What emerges is the view that innovation, entrepreneurship and productivity outcomes are all highly interconnected. In effect, there are increasing returns and economies of scale as our domestic and international networks grow deeper and broader.

This comes from all parties in the system being able to build on each other’s successes – and learn from each other’s mistakes – and is at the heart of our Joined-Up Innovation vision.

Our resulting recommendations, combined with other domestic and international research and views based on Microsoft’s direct experience as a leading innovation-based business, are focused on making Australia’s innovation ecosystem more ‘joined up’.

We place a particular emphasis on the need to foster better connections between our hundreds of thousands of small and medium-sized enterprises (SMEs) and other parts of Australia’s innovation ecosystem. SMEs are a large part of our economy and a key source of employment, meaning that any increase in their success and productivity can have a significant impact.
What is innovation?

For the purposes of this paper, we define innovation as the process of developing better products, services, processes and business models, and then commercialising those ideas by building new businesses around them. Innovation is also essential for improving social and environmental outcomes, but we have taken an intentionally business-oriented view in order to focus on the transition from invention through to the commercialisation of ideas.

This kind of innovation is critical to our prosperity because it is the source of the differentiated high-value products, services and business models that help Australia remain one of the world’s wealthiest countries. It is also central to our ability to increase productivity and economic resilience by working smarter. As Professor Roy Green, Dean of the UTS Business School, said during our roundtable discussion, “I’ve long believed that not only the world’s future, but Australia’s future, lies in developing knowledge-based industries and services.”

Why now?

We need to pay particular attention to innovation now as the mining boom slows and we experience major structural changes in our economy, from competing in an increasingly global market for services to withdrawing from making cars. We must also ensure we can continue to grow our income and solve challenges as other trends take hold, from the ageing of our population and its coming impact on health costs through to the rise of the millennial generation, which already faces new obstacles such as record high levels of youth unemployment.

At the same time, the world of innovation has changed dramatically in recent years, due to the emergence of a deeply interconnected global economy and the hyper connectivity enabled by the Internet. These trends have, for instance, empowered talented individuals and created conditions for the rapid growth of smart businesses.

This includes making it possible for innovators to raise money not only from seasoned investors such as venture capital funds but also new sources, especially online ‘crowds’ of supporters. These changes are presenting extraordinary opportunities for innovators, but also mean that Australian businesses face formidable – and nimble – competition from around the world. The significance of these technology-driven changes was highlighted in a recent report by Boston Consulting Group for Microsoft which found, “The prospect of a growing technology gulf is relevant both for companies themselves and for policymakers around the world.” Australia’s task is to ensure it remains an innovation leader rather than becoming a laggard.
Research participants

To identify where it might be possible to improve or reshape the Australian innovation ecosystem, Microsoft convened a roundtable of experts in February 2014. The participants included:

Sandy Plunkett
Innovation and Investment Consultant (facilitator)

Doron Ben-Meir
CEO, Commercialisation Australia

Suzanne Campbell
CEO, Australian Information Industry Association

Peter Freedman
CEO, RØDE Microphones

Professor Roy Green
Dean, UTS Business School

Hamish Hawthorn
CEO, ATP Innovations

Murray Hunter
Founder & CEO, Design + Industry

Pip Marlow
Managing Director, Microsoft Australia

Adam McArthur
CEO & Co-founder, ParcelPoint

Dr Bill Petreski
Director, Hydrix

Graeme Strange
Managing Director, Readify

Dr Frank Vetere
Associate Professor, The University of Melbourne

Dr Hon Weng Chong
Founder, StethoCloud

We also interviewed a range of other innovation experts based in Australia and overseas, including:

Dr Genevieve Bell
Director of Interaction and Experience Research, Intel

Dr Kate Cornick
Director, Industry Engagement and Innovation, The University of Melbourne

Dr Alan Finkel
President of the Australian Academy of Technological Sciences and Engineering

Based on the views of these experts, Microsoft’s own insights and further research, we have identified the following issues as key areas for action. We believe achieving further progress in these areas will have a significant impact in strengthening Australia’s innovation ecosystem.
OUR RESEARCH FINDINGS AND RECOMMENDATIONS
We believe there are seven key steps Australia can take to improve its capacity to innovate.

1. Focus on interconnections within our innovation ecosystem. While innovation can come from brilliant individuals having ‘light bulb’ moments, most depends on complex relationships between individuals and organisations across the innovation value chain. Australia has the opportunity – and an urgent need – to gain by improving these relationships.

2. Re-invent the way we work and innovate. Australia must move away from slow, linear innovation processes and working within organisational silos and start adopting faster, more collaborative models. Internally, organisations should make the most of the latest possibilities to empower staff, unlock innovation and work in networks rather than hierarchies.

3. Look beyond start-ups. New start-up companies with breakthrough technologies or approaches play a vital role in opening up new growth avenues and in disrupting traditional businesses and industries. However, some of the most significant economic gains will come from ensuring we can lift innovation among all businesses and government organisations.

4. Transform our culture. We need to better celebrate our success stories, to champion role models for future innovators and reduce perceptions of risk. Australians have long prided themselves on their self-reliance and individualism, but in a world increasingly driven by collaboration as well as specialisation, we can improve our multi-disciplined teamwork.

5. Improve knowledge and information sharing. One of the keys to driving better links between the parties in our innovation ecosystem is improving the flow of information between them. We also need to gain a better understanding of what’s working and not working in that ecosystem, including by gathering and analysing more data.

6. Recognise and cultivate the right skills. In addition to reversing the slide in science, technology, engineering and maths (STEM) education and otherwise ensuring we have the capacity to compete at the cutting edge of the global economy, we must also support the development of creative and sales skills.

7. Encourage mobility. Innovation depends on talented people and such individuals are in high demand globally. It also depends on talented people moving between roles and sectors to areas where they can add most value. We must make Australia – and Australian businesses – a destination of choice and remove non-competitive barriers to these transitions.
1. Focus on interconnections within our innovation ecosystem.

2. Re-invent the way we work and innovate.

3. Look beyond start-ups.

4. Transform our culture.

5. Improve knowledge and information sharing.

6. Recognise and cultivate the right skills.

7. Encourage mobility.
A key concept that has been recognised and explored through a range of studies is that the innovation process relies on the supportive interaction of a wide range of parties operating within a cohesive and self-reinforcing system – or ‘ecosystem’.

In its 2013 Australian Innovation System Report, the Australian Government said: “Innovation systems are important because a well-functioning innovation system is fundamental to the long-term sustainability of the country and to maintaining and growing our standard of living.”

The report added that: “A high-performing innovation system should ensure that actors within the system are connected and able to effectively collaborate, thereby maximising the flow and exchange of resources and ideas.” However, the authors also noted that Australia’s innovation system did not appear to be as efficient as comparable systems overseas.

Specific concerns included Australia’s low capacity to generate ‘new-to-the-world’ innovations, limited integration with Asia, lack of a creative business culture and weak business management skills. The latter have been identified as a limitation for Australia in multiple reviews, starting particularly with the 1995 Enterprising Nation report by David Karpin.2

These weaknesses can be seen in our global competitiveness rankings, which are typically high globally but low or average among advanced economies. For example, Australia ranked 19th in the 2013 Global Innovation Index.3 This was better than in 2012 but still placed us behind nations in our region – including Hong Kong, Singapore, South Korea and New Zealand – as well as global leaders such as Germany, Israel, the United Kingdom (UK) and the United States (US).

1. Focus on interconnections within our innovation ecosystem

Action items

- Recognise that innovation occurs within a complex ecosystem
- Improve our position in the Global Innovation Index rankings
- Make it attractive for innovators to work and build businesses in Australia

“We don’t see a burning platform and I think we need to – the rate of change around us is just extraordinary,” said Suzanne Campbell from the Australian Information Industry Association (AIIA). “Whether I’m speaking to students who feel they aren’t able to get the skills they need for the market they’re entering, or how schools are thinking in terms of how they address this problem, there are major gaps in our ecosystem – gaps of expectation and of delivery. We need to be moving very, very quickly to resolve these gaps and move forward.”

This situation is likely to be exacerbated by the current decline in the number of students studying STEM subjects, which are critical to many areas of innovation. For example, since 2001 there has been a 50 per cent decline in enrolments in information and communications technology training and education at the tertiary level. Further, even though Australians often come up with great ideas, the businesses that flow from those breakthroughs are often developed overseas. An estimated 8,000 Australian firms operate in Silicon Valley, for instance, and many of them are new, innovation-based companies. Combined with the many other highly trained Australians working in major innovation locations worldwide, this represents a significant national brain drain.

It is also commonplace for innovative Australian companies to be bought by international groups. This offers benefits, including the possibility that the founders of those companies will eventually feed their wealth or expertise back into the Australian innovation system, but it can also mean that the majority of the economic benefit generated by the companies is realised by other countries.

For all these reasons, it’s clear that if we want to enhance the innovation process in Australia, we need to focus on the connections and interactions between all the parts of our innovation system as much as we focus on the operation of each part.
Australia’s innovation ecosystem

Entrepreneurs: the innovators coming up with new inventions and businesses.

Investors: the capital and expertise to fund and facilitate the growth of innovative businesses.

Small and medium-sized enterprises (SMEs): key suppliers of goods and services, employers and major customers to other enterprises of all sizes.

Academia and research organisations: the deep smarts that provide the source for genuine competitive advantage and world-leading products, services and education.

Larger businesses: major customers for start-ups and SMEs, as well as significant employers and sources of revenue and advice for government.

Government: the source of the rules, policies and infrastructure that are so vital to businesses and citizens alike.

Consumers: the ultimate purchasers of innovative goods and services, and increasingly involved in shaping those goods and services as they’re produced.
The rise of broadband Internet, mobile phones, email, instant messaging, social media and video conferencing is changing the way people work within organisations of all kinds, from small businesses to large companies and research organisations. This is fundamentally changing the way innovation occurs and has major implications for Australia, both in terms of how we are innovating and our place in the now global innovation value chain. So too are other trends such as the rise of Asia, the development of sophisticated contract manufacturing facilities that can build products to order, and the fast-emerging 3D printing industry.

Consequently, we need to ensure that Australian innovation is fast and smart enough to remain competitive. It is vital that we can develop genuinely cutting-edge technologies, services, and business processes and models for domestic use and export, while also quickly adopting such innovations from elsewhere to breathe new life into existing industries and businesses.

2. Re-invent the way we work and innovate

Action items

- Re-engineer our innovation processes, to move from being linear to collaborative
- Break down silos within organisations and between researchers and industry
- Review slow processes, such as time taken to approve patents
2. Re-invent the way we work and innovate continued

New ways of working

With the introduction of the technologies outlined above, people can now work in fundamentally new ways within the same organisational structures. For instance, the latest communications tools have made it easier for people to telework, collaborate and move between formal and informal workspaces within offices. This is a profound shift that is leading to new connections and interactions, and in turn new ideas and ultimately business growth.

“We’ve embraced activity-based working at Microsoft, so I don’t have an office and I don’t have a desk,” Pip Marlow told the roundtable. “One of the magical things that’s happened for me is that through sitting next to somebody who I might be meeting for the first time, I’m suddenly learning about something that I couldn’t have previously asked a question about.”

Distributed innovation

Across the innovation ecosystem, we are also seeing a shift towards nationally or internationally distributed teams of individuals or small groups. For instance, companies might retain individuals who choose to work in dispersed offices and remote locations, including home. Especially for innovative organisations, a person’s mind is now often more important than their physical location and technology is making it easy to work in fundamentally new ways.

Another shift has been the move away from innovation being largely the domain of big, monolithic organisations, centred on a single office location or university. Microsoft itself, for example, spends more than US$10 billion a year on R&D, in part through a dedicated global research arm called Microsoft Research. Microsoft Research is headquartered in Seattle but most of its 1,100 researchers and PhD candidates are located elsewhere in the US or overseas. This includes 250 people in Beijing, China; 100 in Cambridge, England; and others in Egypt, Germany, India and Israel. Microsoft Research also has collaborations with other research groups around the world, including in Australia (see examples in the Appendix).
Parallel approaches

Another key shift is that innovation and product development tend to be completed in parallel to increase speed of delivery. Whereas groups may have spent five to 10 years developing an idea, prototyping and testing it and then bringing it to market, they are now seeking to accelerate each of these steps and, where feasible, run them concurrently. We are also seeing more products being brought to market so early that they are effectively perfected in the marketplace, using feedback from early customers.

Innovators are achieving this by collaborating with specialist providers and using the powerful new capabilities that are now available, from the ability to access effectively limitless computing power ‘in the cloud’ to working with expert software development teams, quickly forming collaborative groups using social networking technology and outsourcing production to the type of contract manufacturers discussed above. Bill Petreski, whose firm Hydrix provides specialised software, engineering and business development services to help clients realise product ideas, told the roundtable, “People aren’t aware of where organisations like us fill the gap for providing expertise and helping other people to fast-track their innovation.”

The Academy of Technological Sciences and Engineering (ATSE) has also noted the critical role of technology intermediaries in accelerating the innovation process. “These organisations play a vital facilitation role to catalyse collaborations between SMEs and PFROs (publicly funded research organisations) and help to ensure that they run smoothly ... they also play an important role in reducing the risk of new collaborations,” it said.

The extraordinary speed at which value is being created in today’s economy can be best seen in the Internet arena. A recent example was Facebook paying US$19 billion – about the market value of the major Australian companies Lend Lease, Origin Energy and Cochlear combined – for WhatsApp, an online messaging service with 55 employees founded in 2009.

One side effect of these changes is that innovators do not appear to be relying as much on intellectual property (IP) protection and the formal patent process as they once did. Not only is that traditional process resource-intensive, it’s often simply seen as too slow for many entrepreneurs and their potential investors.

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6 Translating research into economic benefits for Australia: Rethinking Linkages. The Australian Academy of Technological Sciences and Engineering (ATSE), Position Paper, October 2013.

The UK manufacturing sector’s share of employment and GDP has declined steadily since the 1960s. However, government initiatives, including purpose-built R&D hubs known as Catapult centres, are helping to foster a culture of innovation and build new niche industries.

In 2010, the government committed to investing more than £200 million over four years in a network of Catapult centres, to be created and overseen by the UK’s innovation agency, the Technology Strategy Board. Catapults are physical centres for innovation that connect businesses with research and academic communities.

All Catapults work on seven areas of innovation that have been identified as being strategically important to the UK. Focus areas currently include high-value manufacturing, cell therapy, the connected digital economy, future cities and transport systems. The objective is to use the power of people and organisations working closely together to unlock opportunity, reduce innovating risk, and speed new products and services towards commercial reality.

Depending on specific needs, the Catapults will give individuals from research-based organisations skilled technical resources, routes to funding, access to state-of-the-art facilities to develop and test ideas, and introductions to larger companies.

Case study
Catapulting the UK back into manufacturing

2. Re-invent the way we work and innovate continued
Focusing on our strengths

To succeed on this rapidly evolving global stage, the roundtable group felt Australia must focus on those areas of innovation where it is likely to have an inherent advantage. “We’re only 2 per cent of the world’s economy, 2 per cent of the world’s R&D,” said Roy Green. “We can’t be excellent at everything – we have to find our sources of competitive advantage.”

Green added that Australia could benefit from government coordinating efforts to identify future areas of competitive advantage and where Australia would like to be in another 20 years – and what capabilities will be required to get there.

According to the roundtable participants, the strongest areas are likely to lie close to sectors where Australia already enjoys global leadership, such as mining, agriculture and bio-medicine. It’s also important to look beyond new technological inventions to the world-leading innovation that can be achieved in organisational structures, business models and approaches, and systems integration. Indeed, two of Australia’s most successful innovations are pre-paid postage and the ‘Macquarie Bank model’ for financing public infrastructure projects.

Even so, we shouldn’t assume Australia can only be competitive in a narrow group of areas. The success of Peter Freedman’s RØDE Microphones, which manufactures microphones and other professional audio products in Sydney and exports 97 per cent of what it produces to more than 107 countries, illustrates that Australia can succeed in niche fields.

“We have a team of 140 people, it’s growing like crazy and I can’t get enough engineers,” said Freedman. “I find it very interesting people say you can’t manufacture consumer goods in Australia but we do. It’s to do with the way we produce them, the way we design them and the marketing.”
**Potential actions**

With these trends in mind, we believe it’s important to consider where innovation is occurring and to re-engineer the processes involved in moving from ideas to fully commercialised products, services and business models. According to Bill Petreski, “That’s where we’re falling behind in the whole global innovation ecosystem – we’re still stuck on linear innovation that goes step by step, whereas most people are moving to the open collaboration model.” He added that it typically took around eight years for Australian businesses to bring innovations to market when they followed the conventional linear commercialisation approach.

While there’s no single answer to addressing this issue – and Murray Hunter from Design + Industry noted that it can be necessary to work in linear ways to ensure product safety and gain regulatory approvals – there are concrete steps that could be pursued.

These include:

- breaking down silos within large organisations
- incorporating talented individuals into innovation processes, regardless of location
- expanding collaboration, locally and globally, to accelerate innovation processes
- leveraging third-party capabilities, such as cloud computing and contract manufacturing
- reconsidering the way organisations are working internally to unlock innovation
- reviewing patent and other IP-related processes to see if they can be streamlined
- reviewing regulatory approval processes to reduce time to market for innovations.
3.

Look beyond start-ups

Action items

- Recognise that innovation is broader than the invention of new high technologies
- Take a holistic view, spanning from start-ups to SMEs, big business and other players
- Consider the potential smaller businesses hold to create wealth through innovation

According to Roy Green, it’s essential to recognise that innovation extends beyond the invention of breakthrough technologies. Citing Dr Terry Cutler’s seminal 2008 review of Australia’s innovation system, he said, “Innovation is not just about science and technology, important though that is. It’s also about organisational innovation, in accordance with management, workforce participation, systems integration, new business models and design thinking.”

This highlights the need to take a holistic view of innovation that spans from how we can better support the development and commercialisation of new-to-the-world technologies – which is a key focus of many start-up ventures – through to how existing organisations can re-invent their businesses by changing processes and models.

The 2012 edition of the Australian Government’s *Innovation System Report* also found that the majority of Australian businesses do not generate new-to-the-world innovations – in fact, our companies rank relatively low on this score globally. However, innovation of all kinds was a major driver of economic growth, productivity improvement and increased resilience. “Compared to businesses that don’t innovate, innovative Australian businesses are 78 per cent more likely to report increases in productivity over the previous year,” it said.

These findings are backed up by a recent international survey of 4,000 smaller businesses across five major economies, conducted by Boston Consulting Group for Microsoft. The study found that SMEs that were actively using new technologies to improve communications and business processes created more new jobs and drove more revenue gains than SMEs that used little technology.

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8 Venturous Australia: building strength in innovation. Dr Terry Cutler, Department of Industry, Australian Government, 2008.
Specifically, between 2010 and 2012 those SMEs that were regarded as leaders in the adoption of technology increased revenues 15 percentage points faster and created jobs at twice the speed of less progressive firms. A key reason for this outperformance was that the latest wave of technological advancements – such as mobile communications, cloud computing and social media – is giving SMEs access to technological capabilities that were previously available only to large enterprises and at a significantly lower cost.

While it’s critical that both small and large Australian businesses innovate, the Academy of Technological Sciences and Engineering has also highlighted the significant gains to be made from focusing on improving innovation among SMEs. For starters, smaller businesses deliver more than a third of Australia’s gross domestic product and account for more than half of private sector employment. Further, SMEs are less risk-averse than large companies, giving them a greater willingness and cultural capacity to innovate. In particular, ATSE argues Australia should look for ways to make it easier for smaller companies to engage with publicly funded research organisations, so they can access valuable IP while exploring new funding models and other incentives that could foster greater innovation among SMEs. \(^\text{10}\)

Most importantly, many of today’s smaller businesses have the potential to be our next global success stories. Finally, it’s important to recognise the role that government can play as an innovator, in the ways it delivers services. Government is also an important potential customer for innovative suppliers large and small, especially given the scale of procurement completed across all Australian governments.

\(^{10}\) Translating research into economic benefits for Australia: Rethinking Linkages. The Australian Academy of Technological Sciences and Engineering (ATSE), Position Paper, October 2013.

3. Look beyond start-ups continued
Transform our culture

Action items

Better celebrate our past and present innovation success stories
Consider how our business and national cultures impact innovation
Encourage individuals to overcome fear of failure, ask questions and support each other

It's difficult to generalise about a national culture and even harder to link discussions about culture to a country’s innovation performance. However, that's exactly what Reserve Bank of Australia Deputy Governor Phillip Lowe did in a recent speech, voicing his concern that the ageing of Australia's population could make the country less innovative and entrepreneurial.

"My own tentative answer is that there has been a subtle, but important, shift in the way we think about risk and innovation. In particular, our preferences appear to have shifted in such a way that we increasingly focus on risk mitigation and risk control," said Lowe.11

If he’s correct, then it adds even more urgency to the need for Australia to focus on its innovation culture. According to our roundtable respondents, a number of cultural obstacles are already preventing our innovation ecosystem from operating as smoothly as it might. These include a low acceptance of business failures, which can make potential innovators reluctant to launch ventures for fear of harming their reputations.

As Alan Finkel from ATSE notes, fear of failure is particularly limiting the flow of talented people between the tertiary education sector and private sector organisations. “We’ve cut it off at the knees by having this tendency to think it’s a failure if you leave the university and go into industry – and it’s a double failure if you go from university to a start-up and the start-up isn’t a successful one,” he said.

The roundtable participants also discussed how Australia’s tendency to prize self-reliance could prevent innovators from seeking advice and support. Some roundtable members felt this was particularly pronounced among older Australians. “I find the younger generation just keeps asking questions about where we got our money, what we do with it and so on, whereas the older ones don’t really,” said Adam McArthur. “They think they should know it so they don’t want to ask.”

Distrust can also make individuals reluctant to share ideas or support others in the innovation value chain. "In Australia, businesses don’t work together," said Peter Freedman. “They’re very guarded about what they’ve got. The attitude is that you’re not going to help anybody because it’s dangerous.”

This view also inhibits academic researchers, according to Kate Cornick. “My view is we die in a ditch over intellectual property,” she said. “We’ve paraded this ecosystem in Australia where we’ve got too many aspiring researchers thinking that they’re sitting on the next Facebook – therefore they don’t want to give anything away.”

Furthermore, innovators themselves often choose to keep a low profile even after they have become successful. Whether it’s a cultural tendency to be modest, an intentional plan to avoid our infamous ‘tall poppy syndrome’ or a fear of being placed on the BRW rich list, the net result is that Australia has few equivalents to Facebook’s Mark Zuckerberg or Microsoft’s Bill Gates.

One solution to these issues is to better promote our innovation success stories. This would create role models for innovators and reduce the perception of the risks involved in pursuing new ideas among both innovators and those in a position to support them, including investors, regulators and, most importantly, customers.

As Graeme Strange asked, “Where are the heroes? Why don’t we know who they are? The guy who invented the black box, who was he? What do we know about him?”

Among suggested nominees for an Australian Innovators Hall of Fame was Paul Trainor, who was a key part of Cochlear’s growth and a visionary behind the growth of Australia’s innovation ecosystem. Another – suggested by Intel’s Genevieve Bell – is David Unaipon, the Indigenous Australian who appears on our $50 note. Unaipon lived from 1872 to 1967 and took out 19 provisional patents (he couldn’t afford to secure full patents) on inventions that included a shearing machine that formed the basis of modern mechanical shears.
5.

Improve knowledge and information sharing

Successful innovators are far more networked and interconnected with others, locally and globally. The Internet has made it much easier for specialists in innovation-driven fields such as computing, engineering and medicine to form close working relationships regardless of location. These specialists and their supporters also have much greater access to information within Australia and around the world – again thanks to the online revolution.

However, Australia has no monopoly over these advances. Furthermore, compared to Silicon Valley and other locations that benefit from similar scale such as parts of Germany, Australia has a relative lack of well-structured or permanent information sources available to participants in the innovation system.

With the exception of a few instances such as the concentration of medical research experts in Melbourne, we have also been weak at creating innovation precincts, yet studies have shown these remain an important part of the innovation mix. “Without the ability to meet and talk to others and to leverage existing talent, innovation remains difficult,” Frank Vetere said at the roundtable.

Australia’s relative lack of information sources and precincts has a number of consequences. Perhaps most importantly, it makes it harder for innovators to form the business relationships they need to be successful, because they often struggle to find or connect with the right people. Those people might be investors, key staff, mentors, early customers, or distributors or organisations that can help innovators realise their business ambitions. These range from government bodies like Austrade to design and engineering suppliers such as Design + Industry and Hydrix, which participated in our roundtable.

This view was emphasised by Commercialisation Australia’s Doron Ben-Meir during the roundtable. “As an entrepreneur and anyone that’s built a business knows, you just have to get to the right people at the right time. It sounds simple but doing it can be very challenging,” he said.

Another consequence is that a lack of information makes it difficult for innovators to create business cases to plan their way ahead or raise funding.

Action items

- Better gather, share and analyse data to give entrepreneurs, investors, researchers, policymakers and others the information needed to act and make quality decisions
- Develop a comprehensive, real-time ‘map’ of Australia’s innovation ecosystem
- Ensure innovators can form the online and ‘in person’ relationships needed to succeed
It also increases perceptions of risk among parties across the innovation ecosystem, in turn making those parties more reluctant to act or provide support to the next member of the chain.

Potential actions that could be taken in this area include:

**Introduce new meta-services.** Information flow is one of the strengths of Silicon Valley. One of the key vehicles that has developed there is online directories such as SiliconValleyIndex.org, which describes the performance of the Valley as a region, and the SV 150 list of the largest 150 technology companies specifically at any point in time. Australia would be well served by similar, readily accessible directories developed with a focus on improving interconnections between the parts of our innovation ecosystem – such as comprehensive lists of investors, researchers, companies and service providers, including lawyers and accountants. Such lists may also support the growth of innovation precincts.

**Map our ecosystem.** There is an opportunity to better collate and analyse the data that we hold about our innovation ecosystem to produce a more accurate and real-time ‘map’ of how our innovation ecosystem is working – and especially to see which government policies and industry initiatives are having the greatest impact. As some groups are starting to explore, this could build on existing studies such as the *Australian Innovation System Report* and could be enhanced by using newly developed data analysis tools.

Speaking at the roundtable, Doron Ben-Meir outlined some of questions this mapping process could answer. “If you have a map of everything going on, and you update that regularly by taking the feeds from all these different places, you will see whether what you are doing is making any difference,” he said.

“How many start-ups are there today versus last year, versus five years ago?” Ben-Meir continued. “How much research are we doing that’s finding expression in the marketplace? How many of our start-ups are developing into medium- to large-scale enterprises? Can we quantify the obstacles and bottlenecks in product development and business cycles within key sectors of our economy? What is the status of our human capital and the rate at which people transition between academia, applied research and business?”

**Enhance current capabilities.** There are already numerous news services, associations, conferences and other vehicles operating in most innovation-driven fields in Australia. However, many suffer from a lack of scale and consistency. Indeed, given Australia’s size, these are often labours of love maintained by passionate individuals. The first step is to review those through the lens of improving our innovation ecosystem. We need to ask whether they’re operating as effectively as they could be and see if there is room for improvement – for example, by merging groups, forming international links or rethinking the funding arrangements for those services and bodies.
The US Government’s Small Business Innovation Research (SBIR) program is hailed by Alan Finkel of the Australian Academy of Technological Sciences and Engineering as “transformational” and one of the best inducements to innovation in the world.

Since its enactment in 1982, SBIR has helped thousands of small businesses explore their potential and profit from the commercialisation of their ideas. The program’s objective is to provide funding for the best early-stage innovation ideas – ideas that, however promising, are still too high-risk for private investors, including venture capital firms. Innovations from the program have helped industries such as defence, health care, and data storage and analysis.

US federal agencies with R&D budgets that exceed US$100 million a year are required to allocate 2.8 per cent of their R&D budget towards the SBIR program. Non-purchasing agencies allocate SBIR funding through grants. In total, the program gives approximately US$2.15 billion per annum to small businesses to perform R&D.

Each government agency administers its own individual program within guidelines established by Congress. These agencies designate R&D topics and accept proposals only from small businesses (less than 500 employees). Awards are made on a competitive basis after proposal evaluation. The winning company has its development expenses covered and, more importantly, will also have the department or agency validate and use the product.

The SBIR program extends to individuals who may have a viable idea but limited funding and no past record of success. Following a phase one SBIR feasibility study of the proposal, the individual can apply for incremental funding increases to develop the idea until the product is ready for commercialisation.

The benefit to the US economy is through the tax system. The SBIR scheme itself takes no equity and has no repayment provisions.12

Recognise and cultivate the right skills

The development of genuinely novel innovations typically relies on technical mastery in a complex area, especially STEM fields. Some Australian examples include the invention of penicillin, the black box flight recorder, polymer banknotes and the vaccine for cervical cancer. It is also important that Australia retains a strong capacity to create software, which so often captures the new thinking at the core of innovative products and business processes.

This means it is appropriate to pay close attention to our STEM capabilities, and to be concerned about the drop-off in enrolments in related courses. Along with a number of the roundtable attendees, Microsoft would be particularly keen to see technology-related skills and knowledge become part of the standard primary and high school curricula in Australia. Even for students who don’t go on to careers as programmers or in other technical roles, this would provide a basic understanding of how computing and other technology systems work.

Action items

Support the development of science, technology, engineering and maths skills
Recognise that innovation success requires a mix of technical, creative and sales skills
Provide seed funding and other support for innovative ventures
However, our roundtable discussion and observation of successful innovation regions around the world point to other key factors: humanities-based creativity; “boundary crossing” skills such as the ability to communicate, solve problems and think critically; and the capacity to sell.

Hon Weng Chong, for example, said that while the technology behind StethoCloud’s product was based on technical expertise in computing and medicine, he could trace some of his creativity and interest in entrepreneurialism to a high school course on design and technology. These comments and other parts of our research suggest that if Australia wishes to build its innovation capability, it must focus on building its creative capacity as well as its technical skills.

This includes teaching creativity through the humanities and new management approaches, and fostering creativity through support for cultural activities. A strong cultural scene would also attract the best and brightest professionals to live and work in Australia. As Genevieve Bell said, “If you say you want to be an innovation engine, I think you have to fund the arts and the humanities. I think you have to fund theatre.”

By focusing on our sales skills, Australia is also more likely to see ideas form the basis of real and viable businesses. Doron Ben-Meir cited the view held by many venture capitalists that having a great idea – unique IP – is often only about 1 per cent of the innovation battle. The other 99 per cent is the hard work of bringing that idea to market – especially selling.

“Everyone who’s ever started a business knows that they’re the number one salesperson for that business,” said Ben-Meir. “If they’re not, they can’t start the business.” Peter Freedman added, “If you want to get into a company, you’ve got to have front – you’ve got to be a salesperson but some people would rather eat grass than knock on a door!”

The good news is that the generation of students coming through our high schools, TAFEs and universities appears to have a strong interest in entrepreneurialism.
“I’ve been teaching entrepreneurship at universities for about eight years,” Hamish Hawthorn told the roundtable. “Eight years ago, you’d ask the class ‘Who here is going to start their own company?’, No hands go up. Now, it’s not the whole class but it’s a significant proportion of the class saying, ‘I want to go and start my own business, I want to do something amazing’.”

Frank Vetere added, “Looking at some of my students, they are hungry for innovation. They are very entrepreneurial, terribly bright, very well connected and very savvy. I just see extraordinary potential rather than negativity from my end.”

This enthusiasm is being met with new programs from institutions such as The University of Melbourne and UTS, including no-obligation grants and resources to help students commercialise ideas, and the development of new precincts around those universities to encourage greater interaction between students and major businesses.

The University of Melbourne program provides $20,000 in grant funding and the use of its facilities to students to develop prototypes of new products. “It’s like a competition every year to choose which four or five teams will get their $20,000 to do this prototyping,” said Kate Cornick. “We’ve had in the order of 50 to 60 applications over the past two years – of the first year’s group, we’ve now got four companies who have all done start-ups.”
7.

Encourage mobility

Action items

- Make it a priority to attract highly mobile innovators to Australia – or keep them here
- Change incentives to foster mobility between academia and business, and between conventional and innovative projects within companies
- Foster connections with innovators worldwide, especially Australians working overseas

One of the most important concepts covered at the roundtable – and the innovation discussion in general – is the mobility of talented individuals and high-value businesses, and the incentives that drive mobility within Australia’s innovation ecosystem.

This spans technical specialists and entrepreneurs who move interstate or overseas. It also relates to the freedom with which academics and researchers can move between research-based roles and industry; how executives can move between large companies and start-ups or vice versa, or into and out of Australia; and also the conditions for Australian investors to invest overseas or for foreign investors to invest in Australian businesses.

This is a big topic, but there is one unifying principle: nations that want to succeed in today’s fast, competitive and global environment need to focus on improving mobility. The reason is that high-value talent, companies, investors and even customers are now all far more mobile – literally because they are using wireless communications and in the sense that the world is constantly shrinking as it becomes easier to travel, knowledge is more freely available and countries seek to harmonise financial and regulatory systems.

In Australia’s case, our roundtable discussion and other research highlight a range of areas where Australia could do more to promote mobility – in all senses – as a way of enhancing its innovation ecosystem.
Changing academic incentives. According to Roy Green, there is currently little encouragement for Australian academics to engage with the private sector and there are obstacles that prevent the movement of individuals between academia and business. "There are perverse incentives operating that militate constantly against collaboration and engagement," he said. These include a focus on publishing in journals, rather than demonstrating the socio-economic impact of research work.

Encouraging business mobility. One of the main sources of innovation in Australia is big business. However, there is often little incentive for talented executives within large companies to move out of proven areas of business into more innovative and therefore riskier areas. If we want our major companies to play their potentially important role in driving national innovation, we must consider the rewards on offer and cultures in place within those larger businesses.

Staying in touch. We believe it is vital to maintain relationships with Australian innovators who move overseas – as the Advance non-profit organisation seeks to do in fostering networking and celebrating leadership and innovation among the estimated 1 million Australians who work outside their home country (see case study). Just as companies have alumni programs and use them to maintain high-value networks of mobile individuals, Australia should seek to maintain ties to its best and brightest innovators even if they spend extended periods overseas.
Case study
Keeping tabs on Advanced Australians

With over 1 million Australians living in other countries, the ‘brain drain’ of talented, innovative individuals overseas has been a persistent and costly concern for business leaders. Non-profit organisation Advance was created to ensure local links are established and maintained with this globally dispersed group of Australians. Advance is working towards the creation of a global community of Australians, alumni of Australian universities and ‘friends of Australia’. Online and live community forums allow participants to forge friendships, share knowledge and spawn new business ideas. Advance targets Australian companies with global growth aspirations, young Australians looking to make their mark, and established leaders who want to give back to the next generation of Australian talent.

The annual Advance Global Australian Awards have also been created to celebrate those Australians living overseas who exhibit exceptional talent and are innovators in their chosen field. They are the only awards to recognise the contributions of Australians living abroad. Among the 2013 winners were:

Christopher Boshuizen
Winner of the Global Australian of the Year award and co-founder and CTO of Planet Labs Inc. In less than two years, Boshuizen has led the company from the drawing board to having two Earth observation crafts in space. The company aims to launch a further 28 satellites in the next 12 months.

Andrew Tanner
A professional engineer who has over a decade of experience in the development and deployment of advanced solar heating and cooling solutions. Tanner helped create Australia’s largest solar thermal installation and established solar industry leader Ausra from a Sydney garage in 2002.

Dr Richard Pestell
An entrepreneur, researcher, clinician and leader in the global cancer community who holds six issued or pending patents in the area of cancer diagnostics and treatment.
Next Steps
Australia has a proud history of innovation but we believe we can perform even better. The Internet and the vast range of new technologies, working methods, business models and funding options at our disposal give innovators greater and cheaper tools to do just that. However, to make the most of today’s possibilities and exploit them competitively, we need to ensure our innovation system is as efficient and effective as possible.

We need to look at whether our innovation system is fit for the realities of today’s digital age, rather than being locked to the principles of the industrial age. In particular, we must consider how we can improve Australia’s competitiveness by creating better links between all the key parts of our innovation ecosystem, and improving the performance of the varied parties that all play a role in bringing our ideas to market.

This report has discussed a wide range of issues and proposed numerous ideas and recommendations. We would encourage all parties in the innovation ecosystem to consider where they may be able to lend support or modify their approaches to achieve these goals.

At Microsoft, we certainly plan to do our part. We are already a major supporter of Australian innovation, delivering a range of initiatives including start-up incubators, research joint ventures and awards programs (see Appendix). As one of the world’s leading providers of devices and services, we also directly assist business and government organisations, not-for-profit groups, specialist developers and our partners to become more innovative.

Based on this research and our vision for Joined-Up Innovation, we plan to further refine our approach to supporting innovation in Australia. We’ll also be working hard to promote a national conversation about the need for innovation, how the innovation landscape has changed and how Australia should respond. This is based on the belief that no single individual or organisation can change the entire system, but every individual and group can play a part.
Learn more

www.joinedupinnovation.com

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Further reading

Ahead of the Curve: Lessons on Technology and Growth from Small Business Leaders.

Australian Government, Department of Industry.

Commonwealth Scientific and Industrial Research Organisation.

Entrepreneurial Ecosystems Around the Globe and Company Growth Dynamics.
World Economic Forum, September 2013.

Innovation ecosystems: empowering entrepreneurs and powering economies.
Economist Intelligence Unit for Barclays, January 2014.

The Global Innovation Index 2013.
The World Intellectual Property Organization, INSEAD and Cornell University.

Translating research into economic benefits for Australia: Rethinking Linkages.
Australian Academy of Technological Sciences and Engineering,

Venturous Australia: building strength in innovation.
Dr Terry Cutler, Department of Industry, Australian Government, 2008.
Appendix: Microsoft’s Australian innovation programs

Microsoft invests in innovation in Australia through a wide range of initiatives including:

**BizSpark**, a program that provides free software, support and visibility to start-ups. Participating start-ups gain access to over 900 current, full-featured software development tools, platform technologies and server products. They also become part of the BizSpark ecosystem and gain access to investors and advisors to help run the business, find talent and obtain financing. BizSpark has reached more than 75,000 entrepreneurs and helped over 45,000 start-ups worldwide get off the ground in recent years.

**Queensland Microsoft Innovation Centre**, which opened in 2012 and is aligned with the global BizSpark program. The centre enables government, academic and industry participants to collaborate on research and the development of technology and software.

**GovHack**, a free annual event which has been supported by Microsoft and runs over a 48-hour period. Designed as a fun event for web and application developers, as well as open data, visualisation and user-experience experts, GovHack uses government-supplied data to create new ‘mashups’, data visualisations and apps.

**DreamSpark** and **Imagine Cup**, two complementary programs that provide Australian high school and university students with the development tools they need to enter a global programming competition. As well as offering generous prizes, the Imagine Cup creates links between young developers, industry professionals and potential investors.

**YouthSpark**, a global initiative through which Microsoft provides grants to youth-oriented, non-profit organisations. In its first year alone, Microsoft YouthSpark created opportunities for more than 103 million young people in over 100 countries, including Australia. YouthSpark also encompasses several Women in Tech initiatives, including:

- **Microsoft IT Girls**, a one-day annual event that aims to demonstrate to teachers and students the breadth of IT career options available.
- **ABCN (Australian Business and Community Network)**, a mentoring initiative for students from disadvantaged backgrounds.
- **Robogals**, a not-for-profit organisation that runs robotics workshops for primary and secondary school students to encourage an interest in STEM.
BioSA Tech Hub, a new entrepreneurial hub in Adelaide that Microsoft is helping to develop, along with the South Australian State Government and other partners.

The Indigenous Astronomical Knowledge Project, a pilot project in which Microsoft Research helps utilise World Wide Telescope (WWT) technology to aggregate data about Indigenous people around in the world.

Partners in Learning, a global Microsoft project that helps educators and school leaders connect, collaborate, create and share innovative educational techniques for the 21st century.

IT Academy, a Microsoft program that provides the latest technology and training resources to nearly 500 high schools, universities and other academic institutions across Australia.

Global Software Donation Program, a partnership with more than 70,000 non-profit organisations around the world that aims to provide affordable access to technology. In FY13, US$795 million worth of software donations were made – more than US$40 million of these were for Australian non-profit organisations.

There are also various Microsoft Research collaborative projects underway, including:

- the Centre for Social Natural User Interface Research, a research partnership between Microsoft and The University of Melbourne, launched in December 2013 with the support of the Victorian State Government. The new centre fosters interdisciplinary research into creating and understanding innovative interfaces that facilitate human communication, collaboration and social interaction
- working with The University of Queensland to accelerate the extraction and correlation of Great Barrier Reef monitoring data from satellite imagery and citizen scientists’ observations
- working with The Australian National University to advance medical image analysis through high-performance heterogeneous computing, numerical simulation and novel human/computer interfaces
- working with The University of New South Wales to uncover insight into Aboriginal translations of the night skies
- working with The University of Technology, Sydney, to advance 3D non-rigid surface reconstruction and tracking using RGB-D cameras.