Are we innovating enough?[1]

Dr Terry Cutler

Innovation is always unfinished business

I last spoke at this forum two years ago, and then I entitled my paper "The unfinished business of innovation". To some extent this had been an opportunity to examine the extent to which issues raised in the 2008 report from Review of the National Innovation System, *Venturous Australia,* had been addressed in the Government's subsequent 2009 policy statement, *Powering Ideas*. I later changed the title of my speeches on this topic to "The never finished business of innovation". And the significance of this change in headline title was to contextualise contemporary discussion to emphasise the important message that the business of innovation is never, ever, finished. There is no "final solution" or resolution; no final policy position. Innovation, like understanding, is a journey, a process of change, and not a destination. There needs to be continuing discussion and re-examination as circumstances change, as our understanding of the innovation challenge deepens, or as new opportunities emerge. Innovation is a playing field where the goal posts keep shifting.

The questions behind the question

On this occasion I have chosen as my theme the title "Are we innovating enough?" In part this topic focus was prompted by the release at the beginning of August 2011 of the Government's second annual report on Australia's innovation performance[2]. In posing the question "are we innovating enough" I suspect you will know what the answer is going to be. So the point of this question is really to raise the questions behind the question, which you could probably also answer in advance as they are fairly predictable. But we rarely ask or address these questions. The excitement, potentially and hopefully, lies in the ways in which we think about these questions. Robert McNamara, President John F Kennedy's Defence Secretary, is famous for asking the question about defence budgets: "how much is enough?" We can ask the same about innovation: how much innovation is enough, and are we investing enough in the right things?

Innovation is not an end in itself

Why are we innovating? Innovation is not an end in itself: it is a purposeful activity. There is a dangerous trap that even some people in our national capital fall into, and even more among the conference circuit spruikers of innovation, and that is the trap of the false syllogism that innovation is good, therefore more innovation must be better. A slightly more convoluted version of this is that R&D is good, therefore more R&D is better, and more R&D will make us more innovative. As the character Sportin' Life sings in Gershwin's *Porgy and Bess*, "It Ain't Necessarily So".

We need to work backwards from goals and aspirations

It ain't necessarily so because innovation is not an end in itself: it is purposive activity. We need to innovate to become and remain competitive and productive as firms, industries and a national economy, and we need to innovate to secure the quality of life and the sustainable wellbeing of our community. So if firms and industries are failing to be competitive and productive, it's probably a good indicator that they are not innovating enough. If we become increasingly concerned about the way congestion, for example, is degrading the quality of urban life, then we might conclude we need more innovation around designing better

---

[1] This is an edited and expanded version of an address given at an Oracle Thought Leaders lunch in Canberra, August 2011. A short biography of the speaker is attached.

[2] Department of Innovation, Industry Science and Research, *Australian Innovation System Report, 2011*, Canberra, August 2011

cities and an enhanced urban quality of life. These are pretty good indicators that we are not innovating enough, or not in the right areas.

Many of our responses to challenges and crises are not innovative

The morning this paper was delivered I read in the newspapers a report on the reaction of Australian fruit growers to a World Trade Organisation ruling that Australia's use of quarantine restrictions to ban the import of New Zealand apples and pears was an unjustified abuse of free trade rules. Fruit growers and some politicians responded by arguing that the WTO ruling should be ignored. In other words, sidestep competition and productivity challenges by regulating them out of existence. Another recent example of innovation failure is the response of Australia's retail sector to a sales downturn. For years Australian retailers had not faced much competitive pressure because the sector was pretty protected by Australia being a small, remote market in the global retail trade. It was not significantly trade exposed to competition, and consumers had limited choice. In a digital era, however, consumers going online have been finding out that they are being ripped off by local retailers, and that there is greater choice in offshore markets. But instead of saying to themselves, "we are not innovating enough, we are not reinventing our business models, we are not providing adequate customer service", the knee-jerk response of the retail sector has been to say "let's introduce unproductive and costly tax barriers to deter people from buying off more competitive and productive and innovative retailers". In this they have been following the same self-destructive pattern of behaviour the music industry pioneered.

Innovation means getting out of our comfort zones

Of course if Mark Twain were in the audience, and after all he is famous for having quipped that rumours of his demise were greatly exaggerated, he might well at this point have chipped in with what is currently one of my favourite lines of his:

"It ain't what you don't know that gets you into trouble. It's what you know for sure that just isn't so".

One of the many reasons for not innovating enough is that it involves moving out of our comfort zones, and challenging dearly held assumptions about the way things are. Victor Hugo once made a similar point, although in less earthy language than Mark Twain:

"There are two ways of ignoring things; the first is by ignoring them; the second one is by ignoring them while believing that one knows them. The second form of ignorance is worse than the first".

The distinguished Australian scholar, Pierre Ryckmans (aka Simon Leys) has noted that actually Hugo was "rephrasing an old principle of navigation: the sailor who does not know his position is in less danger than the one who mistakenly believes that he knows it"[3].

Building the right knowledge base starts with asking the right questions

The final recommendation in the 2008 *Venturous Australia* report was a call for investment in research to create a better knowledge base about innovation and whether we are doing enough, or well enough. The lack of such a research institute is a major gap in our innovation armoury. There are not a great number of role models, but two stand out: the Centre for Business research at Cambridge in the UK, and the Industrial Performance Centre at MIT in the US. The directors of both these centres were advisers to the 2008 innovation review team.

[3] Simon Leys, *The Analects of Confucius: Translation and Notes,* W H Norton & Company, New York 1999, p. 118

Our perspective is distorted because of the way we try and measure our innovation activity

Building the right knowledge base starts with asking the right questions. One of the ever present dangers with innovation research and our benchmarking of activity is that we tend to focus only on the things which are easily measurable; this problem is compounded and sinks to the lowest common denominator when we try to establish indices of, for example, comparative performance metrics across OECD economies.

In his Nobel prize winning lecture of 1974 the economist Friedrich Hayek talks about the limits to empiricism in dealing with complex human systems like markets (and socio-economic change):

While in the physical sciences it is generally assumed, probably with good reason, that any important factor which determines the observed events will itself be directly observable and measurable, in the study of such complex phenomena as the market, which depend on the actions of many individuals, all the circumstances which will determine the outcome of a process … will hardly ever be fully known or measurable.

In other words, we are not going to gain useful insights into action imperatives if we apply overly simplistic measuring sticks and templates. Benchmarking our innovation efforts and trying to understand the dynamics of the innovation process in different contexts is as much art as science.

Applying hindsight, insight, and foresight to the innovation challenge

The thoughtful understanding of innovation calls for a combination of hindsight, insight, and foresight. We need hindsight to understand where we have come from, and to learn from the histories of innovation and innovations. Innovation, like knowledge, is cumulative and "stands on the shoulders of giants". We also need insight and clarity about where we stand now. We need to be brutally honest about where we stand, and how we are placed. Finally, we need to exercise foresight in anticipating emerging challenges and opportunities. Recently I have observed the value of thoughtful foresighting in the way CSIRO has used an exploration of observable "megatrends" and possible "megashocks" to shape its forward strategic plans and science investment priorities[4]. Attention to emerging trends and opportunities illuminates our appreciation of innovation options, and focuses attention on the need for timely investment in developing next-generation capabilities. This is about investing for *preparedness*. On the other side of the ledger there are threatening megashocks to our socio-economic systems, whether pandemics, cyber-terrorism or seismic geological disruptions, which are not a matter of "whether" but of "when". How then do we invest in *resilience* across our innovations systems?

So what do we think we know for sure?

Looking at some scorecards we use to assess whether we are innovating enough, however, reminds us of some sobering realities of life.

Three leading business magazines – *Business Week*, *Fast Company*, and *Forbes* publish annual league tables of the "world's most innovative companies. CSL is the only Australian company to feature in any of these, but only in the *Forbes* list which emphasises an "innovation premium" purportedly factored into the stock price. Reviewing changes in the rankings over the years highlights three things:

1. While the US continues to have the greatest number of innovative firms, its relative dominance has been declining;
2. New firms from emerging country markets and regions are

[4] CSIRO, *Our Future World: an analysis of global trends, shocks and scenarios*, 2010

capturing a growing share of the limelight; and
3. There is a growing cadre of "born digital" firms or businesses leveraging off digital platforms.

These league tables provide crude but useful reality checks, and show how innovation is driving structural change in the economy – just think Facebook or Netflix. At the more macroeconomic level we have the annual surveys by INSEAD – the Global Innovation Index – and the World Economic Forum's Global Competitiveness Index. In both of these indices Australia just sits in the middle of the pack, representing average performance at best.

None of the above, nor the OECD club comparative statistics which dominate our own *Australian Innovation System Report*, dispassionately highlight some of the more sobering features of Australia's situation and performance. The inconvenient truths include the realities that:

- The Australian economy at large is just not trade oriented nor exposed – we have one the lowest trade intensities of any developed economy and unlike our peers in this category do not have the offsetting benefit of a large domestic market like the US or Japan;
- we are a bit and shrinking player in the global innovation and research market; and
- being a small country economy we struggle to achieve scale in all but a few areas, and we disguise and sidestep this reality by using metrics expressed in per capita or percentage terms rather than confronting the tyranny of absolute numbers and volumes. Scale matters. Small country economies need to confront overshadowing strength with smarts – we need David versus Goliath strategies.

The ways we measure and account for innovation are woefully inadequate

Looking at some scorecards we use to assess whether we are innovating enough, furthermore, reminds us that we fall into the trap of not benchmarking the most important things. We focus on inputs to innovation systems, not outputs and outcomes like changes in our relative competiveness or productivity growth. In our metrics and assessments there is little or no attempt to link investment in inputs to resultant market performance and community outcomes. This means that we cannot determine the national return on our investments in innovation.

Innovation is granular

It need not be so. With commitment and some effort disparate national data sets could be linked and cross-referenced. To understand what is happening, or might happen, at the firm or institutional level, however, we need analytical granularity. The Australian Government's *My School* website and performance database is a good example of a granular data base against which to benchmark innovative initiatives, and to track them over time.

Queenland's Creative Business Benchmarker is an oiutstandinding exemplar of what we need

Another outstanding example of the value of granular sectoral data is the Creative Business Benchmarker[5] developed by the Centre for Creative Industries and Innovation for the Queensland Government. This is a unique business tool that allows firms to compare their own performance to similar firms in Queensland, measuring firm productivity, profitability, growth and exports. For individual firms it provides a practical performance tracking and diagnostic tool, for industry associations it provides an authoritative and dynamic situation

[5] See http://www.benchmarker.org.au/

analysis, and for Government it provides, almost uniquely, a tool to track the impact of industry development initiatives and the return on investment. The greater deployment of such granular performance measurement tools would greatly enhance the evaluation of how innovation is working on the ground, and help to better focus the efforts of all parties.

So we need innovative research into innovation itself

It is, therefore, only through deeper and more granular research into innovation itself that our capacity to pursue and promote a greater culture of innovation will be enhanced. Such work, sustained over time, would better equip us to address the question of whether we are innovating enough, or investing in the right things to produce innovative outcomes.

An obvious agenda around people, digital productivity, and design

From where we stand today, however, I believe we can confidently assert that there are three key areas, three key innovation drivers, which can drive better long term returns to effort and investment. These are how we think about our investment in people, the way we drive a digital productivity agenda off the deployment of broadband networks and digital service delivery platforms and tools, and the embedding of design practice within business management and strategy.

It is people who innovate

Given the obvious statement that it is people who innovate and that it is our persistent ingenuity as a race that makes us what we are as a people, it is somewhat extraordinary to note how little attention we pay to the question of how, in Richard Florida's words, we "fuel and tap" the potential of our human talent.

Problem-solving illiteracy

In 2006 the Australian Bureau of Statistics conducted a survey of population literacies as part of a wider cross-country investigation[6]. Every time I look back at the report from this survey I feel shocked; the feeling of shock is compounded by the fact that this survey is so seldom referenced as if we are trying to sweep inconvenient truths under the carpet. The truly shocking finding from this 2006 survey is that no less than 70% of the population was found to be below the "minimum required for individuals to meet the complex demands of everyday life and work in the emerging knowledge-based economy". Only 5% of the population scored at the top end of the scale. This is truly shocking when we join in the delusional chorus that "everyone can be creative" and make a difference, be innovative. Does this not suggest that there is something profoundly amiss with our educational systems and our managerial approach to the development of "human resources"?

Our narrowing educational horizons

How do we educate? Our contemporary educational systems simply do not form, shape nor reward the development of people with the skills and confidence to be innovative and entrepreneurial. I characterise some of the core capabilities we need as being multidimensional, collaborative, and questioning.

Our educational systems have become increasingly focussed on the acquisition of vocational skills and less on the production of rounded human beings. Ironically, the grandfather of economics, Adam Smith, promoted a broad education as an antidote to what he saw as the "brutalism" of narrow vocational specialisation arising from the specialisation of effort he was the first to identify as the driver of market capitalism. In this he was at one with Confucius, who founded a tradition which revolved around the proposition that "education is not about

[6] Australian Bureau of Statistics, Cat. 4228.0 - *Adult Literacy and Life Skills Survey, Summary Results, Australia, 2006*

having, it is about *being*"[7]. Confucius famously rebuked a disciple who asked him to teach agronomy with the curt retort: "better ask an old farmer".

Putting the human back into the capital equation

If reference to Confucian traditions and the value of a mandarin meritocracy makes us uncomfortable today, then I can argue the same propositions by returning to the insights of the dour, rigorous Scot, Adam Smith. In contrast to our propensity today to distinguish between "capital" and "labour" as asset classes, Smith saw "talent" as an integral part of the fixed capital of any enterprise. He described the fixed capital of any enterprise under four categories:

- *Useful machines*
- *Specialised buildings*
- *Land improvements*
- ***The "acquired and useful abilities" of people***

He then goes on to remind us of the importance of treating investment in people with as much if not more attention than we devote to the working life of our physical machinery.

"The acquisition of such talents, by the maintenance of the acquirer during his education, study, or apprenticeship, always costs a real expence, which is a capital fixed and realized, as it were, in his Person. Those talents, as they make a part of his fortune, so do they likewise of that of the society to which he belongs. The improved dexterity of a workman may be considered in the same light as a machine or instrument of trade which facilitates and abridges labour, and which, though it costs a certain expence, repays that expence with a profit."[8]

Smith's emphasis on the importance of "the acquired and useful abilities" of people highlights the need for us to take a "whole of life" perspective on our investment in people capabilities as a capital asset. It never ceases to surprise me that corporation Boards spend endless time debating the return on investment for physical assets – their useful accounting life, the investment in maintenance, and the treatment of depreciation – whilst seldom applying the same investment evaluation template to the crucial human capital of the firm. We devote a lot of discussion to the efficacy or otherwise of early educational formation, but little to the importance of "whole of life learning", and the "whole of life" productivity and returns of our human capital.

Does our investment in people produce people who are capable of being innovative?

It follows, not surprisingly, that I have a keen interest in assessing our educational policies and enterprise human resource management practices against the test of whether we are developing those "acquired and useful abilities" which underpin the innovativeness of our talent pools.

Let me boldly assert that innovative talent will be people who are multidimensional, collaborative, and of a curious and inquiring disposition. The last is, I think, a corollary of the first two.

We need multidimensional people who are able to "connect the dots" across fields of specialisation or entrenched market spaces. Further I believe that only multidimensional people can develop effective collaborations. We talk and invoke the virtue of collaboration endlessly,

[7] Simon Leys, *The Hall of uselessness: Collected Essays*, Black Inc, Melbourne, 2011, p. 282

[8] Adam Smith, *An Inquiry into the nature and Causes of the Wealth of Nations*, Clarendon Press Edition, edited by R. Campbell, A. Skinner and W. Todd, Oxford, 1976, Vol 1, p.126

without remarking on the fact that real and productive collaboration is extraordinarily rare and very hard work.

Combinatorial innovation

Most innovation is what I describe as combinatorial innovation, the novel and creative combination of pre-existing knowledge and ideas. Innovation, like knowledge, is cumulative and additive. Advancement involves not only how we combine different things, but how we bring together novel combinations of people in a creative crucible.

Re-engaging with social capital

Acknowledgement that innovation is combinatorial and implies collaboration reminds us that putatively the most important factor in human progress and advancement is social capital: the way our human interactions and collective action produce more productive and creative outcomes than any of us can achieve by ourselves. Noting that innovation is fundamentally fuelled by the flows of information, we need to remind ourselves that it is people and their connections that are the carriers of information. This is the telling message behind the title of John Seely Brown's book, *The Social Life of Information*. Social capital is formed and is a function of social networking and cross-disciplinary linkages. We need, therefore, to make a new reconnection between social and intellectual capital. They are the two sides of the same coin. We need to counterbalance our obsession with individual excellence with equal attention to the quality of our social networks and linkages.

In praise of multidimensional people

We can ground this discussion of the attributes of people which are essential to innovation by reference to two descriptions of the ideal multidimensional capabilities desirably embodied in a person. The first comes from Vitruvius' explication, circa 15 BC, of the qualities of a good architect[9].

"He should be a man of letters, a skilful draughtsman, a mathematician, familiar with scientific enquiries, a diligent student of philosophy, acquainted with music, not ignorant of medicine, learned in the responses of jurisconsults, familiar with astronomy and astronomical calculations"

Two millennia later Maynard Keynes penned the following job description for an economist[10]:

"The master-economist must possess a rare combination of gifts ... He must be mathematician, historian, philosopher - in some degree. He must understand symbols and speak in words. He must contemplate the particular, in terms of the general, and touch abstract and concrete in the same flight of thought. He must study the present in the light of the past for the purposes of the future. No part of man's nature or his institutions must be entirely outside his regard. He must be purposeful and disinterested in a spontaneous mood, as aloof and incorruptible as an artist, yet sometimes as near to earth as a politician".

It would be difficult to find better descriptions of the quality of person we need within a truly innovative culture.

Driving digital productivity and eEnablement

How we invest in people and talent will always be one of the key drivers of innovation outcomes. Another key driver is how we deploy technology platforms for innovation, and information and communication technologies in particular. The building blocks for a new wave of digitally based productivity gains and new platforms for

[9] Vitruvius: *The Ten Books on Architecture*. Translated by Morris Hicky Morgan, Humphrey Milford, Oxford University Pres, 1914, Book I, Chap. I: On the education of architects

[10] Robert Skidelsky, *Keynes: The return of the master*, 2009, Allen Lane, London, p. 56

competitiveness are coming together with the rollout of high bandwidth networks, pervasive sensor networks, and new tools for analysing the exponential growth of data assets.

There are some important lessons to be learned from recent history. In 2007 Alan Hughes from the Centre for Business Research at Cambridge replicated in Australia work he had done analysing the drivers of productivity in the United States. The focus of this study was to try and identify the drivers of Australia's strong productivity growth in the 1990s, before productivity stalled around 2004. This study showed that, apart from the traditional strong pattern of productivity growth in the agricultural sector, most of Australia's productivity gains in the 1990s were attributable to just three services industries: wholesale trade, financial services and communications. Looking at the dynamics at play in these industries it emerges that the productivity gains came from innovations around new business models and processes leveraging off the deployment of information and communication technologies[11]. An important supporting factor in this story is the concurrent entry of a whole new generation of technology savvy workers in these areas.

The scope for significant productivity gains in public service delivery

The telling question is why we have not seen comparable productivity gains in other areas of the services sector and other industries. Part of the answer is that a large proportion of the services sector is dominated by government – think of health, community and welfare services, and education. This creates both the opportunity for very significant productivity gains in these areas, as well as an imperative for a greater focus on public sector innovation. More generally, the productivity and competitiveness challenge reflects some decades of insufficient attention to management education in Australia, and the appalling track record of Australian firms in not investing in workplace training and skills – in this regard Australia lags the rest of the world badly.

Better by design

The third leg of a revitalised innovation agenda would involve a strong focus on design and design practice as business and innovation driver. This driver has received active attention in the UK[12] and New Zealand, but in Australia has only so far really been taken up in Queensland whose Ulysses programme[13] replicates the successful "Better By Design" programme in New Zealand. Dame Cheryl Sotheran, the energetic promoter of the New Zealand initiative explains that this has involved: "getting businesses to see that an integrated model of design, driven from the CEO and chair level and not from the design department within businesses, was a way to improve profitability and international competitiveness". Design practice increasingly draws on digital tools for simulation, modelling and rapid prototyping. Skills and capabilities in these areas are key drivers for a next wave of innovation.

Recognising the opportunity costs of not innovating enough

So, in addressing the question of whether we are innovating enough, we need to be prepared to move out of our comfort zones, confront inconvenient truths and realities and, taking heed of Mark Twain's advice, break old and bad habits. Poor performance in our productivity and competitiveness would suggest that we are either not innovating enough, or not investing sufficiently in the capabilities that will drive better enterprise and community outcomes. We need to deepen our human and social capital, pursue digital productivity, and embed design

[11] Alan Hughes and Vadim Grinevich, *The Contribution of Services and Other Sectors to Australian Productivity Growth 1980-2004*, Australian Business Foundation, 2007

[12] See, for example, James Dyson, *Ingenious Britain: Making the UK the leading high tech exporter in Europe*, London, March 2010

[13] http://www.ulyssesdesign.com.au/

practice and capabilities within enterprise strategy and business development. The ultimate test of whether we are innovating well enough is in the outcomes we produce.

Dr Terry Cutler

Dr Terry Cutler is an industry consultant and strategy advisor with a background in the information and communications technology sector. Terry Cutler has authored numerous influential reports and papers on the Digital Economy and innovation.

During 2008 he chaired the Australian Government's Review of the National Innovation System which culminated in the Report, *Venturous Australia*.

He currently holds the following appointments:

Director,	**Commonwealth Scientific and Industrial Research Organisation** (CSIRO) 2002 -; Chairman, Board Commercial Committee
Member,	**International Advisory Panel, Multimedia Supercorridor** (Malaysia)
Director	**Multimedia University,** Malaysia
Chairman	Advisory Board, **Centre of Excellence for Creative Industries and Innovation**
Director	**National Health Call Centre Network Ltd**

He has previously served on numerous other boards, including both industry and cultural agencies.

Terry Cutler is a Fellow of the Australian Academy of Technological Sciences and Engineering, the Australian Academy of the Humanities, and the Australian Institute of Public Administration. In 2002 he was awarded an honorary doctorate by Queensland University of Technology and in 2003 was awarded Australia's Centenary Medal.