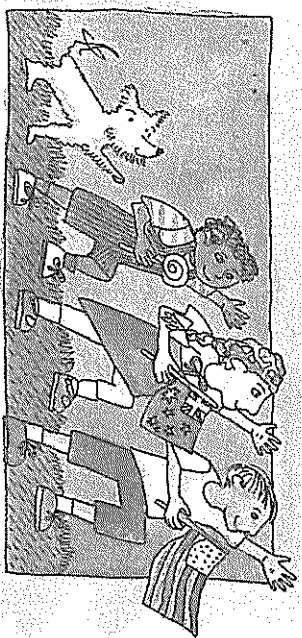


Future scenarios for Australian leadership: No vision, no victory

Robert Burke

No Vision – No Victory
No Guts – No Glory
No Webs – No Wins!



No, it's not the battle cry of the Marines. But it should be that of Australians who answer the urgent call to defend their nation's interests by keeping more of the commercial and social benefits of Australian research and development within Australia. Not to mention keeping the country's destiny in Australian hands.

THE INCLINATION OF Australians to look overseas for leadership is not the inevitable result of a national lack of cleverness or creativity. It is the result of an often faulty perception of ourselves and our world stemming, to a considerable extent, from our infamous and enduring 'cultural cringe': 'To meet the challenges of the 21st century, we must dispense with both misleading perceptions and the cringe, not just to keep the commercial benefits of Australian inventiveness at home, but to keep control over our social and political future as well.

Certainly, our deference to things foreign has cost us dearly in economic terms. The most famous – or infamous – example of Australia failing mightily to capitalise on its people's inventiveness is probably the aircraft data recorders now known as black boxes. This sorry tale is worth repeating, because it's an even worse indictment of the lack of foresight and initiative in both our public and private sectors than most people realise. And, as Santayana put it, "those who do not remember the past are condemned to relive it".

LEST WE FORGET: THE BLACK BOX DEBACLE

In 1954, David Warren, of the Aeronautical Research Laboratories in Melbourne, came up with the idea for a means of continuously recording an aircraft's instrument readings and its flight crew's conversation. Warren's boss helped him develop a prototype device, but his initial research and development (R&D) excited no interest among Australia's civil or defence aviation authorities, or big business. His potential was, however, grasped immediately and enthusiastically when shown to British aviation authorities in 1958. So, with Warren's help, the UK developed the world's first functioning 'flight memory recorder', and the British company involved promptly captured the domestic and much of the world market for the device.

The story doesn't end here. A decade later, when Australia became the first country to make both flight data and cockpit voice recordings mandatory, it approached a US company, United Data Control, to develop the device it specified. So, in fact, Australia

lost out not once, but *twice* over the black box. It's also worth remembering that because Warren's original research was conducted at the Aeronautical Research Laboratories, then part of the Department of Supply and Development, it was funded by Australian taxpayers – who never benefited financially from their investment.³

Not so well-known is the case whereby the late Prime Minister, Sir Robert Menzies, sold a key technology for the invention of photocopying to the Rank Organisation in England, later America's Xerox company, for a mere 1 million Australian pounds (A\$2 million). The technology had been developed by OU Vonwiller at the University of Sydney in 1907 – again, funded by taxpayers. Even if Menzies had asked for a royalty payment of only one cent per copy for 50 years, Australia would have made many trillions of dollars to date – and the royalties would still have about ten years to run.⁴

Consider this: Australia's Chief Scientist, Robin Batherham, says that today, the return on R&D is 10 times greater than the rate of return of any other investment in Australia, including banks, averaging 30 per cent for business and a staggering 60 per cent for the community. Yet Australia nearly lost its scientific research organisation, the CSIRO, to federal economic rationalism.

There is no lack of research quality or inventiveness in Australia (see appendix) but, unfortunately, there is a lack of entrepreneurship. And – yes, you guessed it – leadership. The 2002 Mt Eliza Leadership Index survey highlighted the lack of vision in Australian leaders – even though, paradoxically, the leaders themselves identified vision as a key success element. The survey showed that the Australian leadership style was more concerned with the here and now, rather than the perspective of the past or the promise of the future.

What does this say about the CEOs and boards of Australian organisations? What are the consequences for Australia in having business leaders who think and act in this way? More importantly, how can they be helped to think differently, more appropriately?

GOVERNANCE, GLOBALISATION AND INNOVATION

Some of the answers were indicated at a recent symposium held by the University of Sydney's Faculty of Economics and Business. Each of the speakers at the symposium, 'Governance and Innovation: Beyond the Australian Predicament', was asked to give their personal vision of Australia's future. What was most striking about all the responses was their emphasis on environmental and humanistic issues and values.

For example, Catherine Livingstone, Chair of the CSIRO and Australian Business Foundation, chose to expound on the 'well-being of future generations of Australians in a global community'. Ron Johnston of the Australian Centre for Innovation and International Competitiveness examined the importance of fostering a 'healthy environment'. Former senator and president of the Australian Labor Party, Barry Jones, described the desirability of progressing to where 'life is not just about economics – a fair and just society'.

All speakers agreed with Chris Sykes, of the University of NSW, when, in his address on 'entrepreneurship in Australia that is aspirational', he commented that today's biggest social problems are tomorrow's biggest business opportunities. But, acting on this would require a paradigm shift in many Australian attitudes towards leadership, both corporate and political.⁵

If Menzies had asked Xerox for a royalty payment of only one cent per photocopy for 50 years, Australia would have made many trillions of dollars to date.

For instance, corporate Australia needs greater flexibility and humility, because the more we study the major problems of our time, the more we realise they cannot be understood in isolation. They are *systemic* problems, meaning they are interconnected and interdependent.

FUTURE SCENARIOS FOR AUSTRALIAN LEADERS

There are three possible scenarios for Australian leadership over the next five to ten years. They may be categorised as:

- follow the leader
- borrow the leader
- discover the leader.

The first two scenarios may eventuate if we continue down the narrow leadership path we've been following for the past century. The third is the rather

different, broader path we should instead be heading towards. On the basis of having to know where you're coming from in order to know where you're going, let us now examine the first two scenarios in detail.

**SCENARIO 1:
FOLLOW THE
LEADER**

In this scenario, Australian leaders continue to:

- focus on exploring the essence of organisational success from a managerial perspective
- follow directions set by the US
- be ambivalent towards the 'branch' or 'regional office' syndrome
- exhibit expertise in resource extraction, but remain slow to take up or adapt new, value-adding technologies

There is no lack of research quality or inventiveness in Australia, but there is a lack of entrepreneurship. And – yes, you guessed it – leadership.

- focus on an unchallenged management prescription that ignores non-rational or non-Western approaches in favour of the current 'rational' one that emphasises structures, procedures, job descriptions, information and measurement
- isolate themselves from neighbouring countries by sticking to such essentially Western business practices and theories
- follow a leadership strategy that rests on a single way forward, a carefully laid-out plan which provides the organisation with a largely immutable road map for the future
- cling to the pathway of extrinsic motivation
- limit their development to linear, zero loop and single loop learning
- continue to have their success measured only by return on financial and physical capital.

Although comfortable for many and outwardly supportive of the laidback Australian lifestyle, the 'follow the leader' scenario could ensure Australia becomes an irrelevant player in the global arena – not least because, as Australia's enmeshment in worldwide systems increases, challenges to the laidback lifestyle itself will also multiply.

Obviously, some things must change. What these could be was alluded to when Chris Sykes proposed turning today's social problems into tomorrow's business opportunities. An example of what he and speakers with similar views were thinking of, is the belief that, if we can get the environment right, wealth and wellbeing for Australians – individuals and organisations – will follow. This will not only require a change in attitude towards environmental issues – not just on the part of business leaders – but an openness to recognising environmental assets and problems, and

capitalising on both. An obvious example is that, given its climate, Australia should occupy pole position in the race towards full commercial exploitation of solar energy.

However, not all opportunities are as obvious as the need for us to use more non-fossil fuels. To spot others may require a different way of looking at the world, and a

more independent, imaginative and holistic approach to developing and marketing local products, to the benefit of the local community as well as the bottom line. It will mean giving greater weight to attributes largely ignored, or even considered anathema, in traditional Western business practice. For instance, we all know a lot about IQ. But, how many of us know a great deal about EQ and SQ – emotional and spiritual intelligence quotients?

There is now a general understanding that there are multiple intelligences, as Howard Gardner of Harvard University has demonstrated (see figure 1).

Figure 1
Gardner's nine intelligences

- **Linguistic:** shown in the extreme of poets
- **Logical/mathematical:** displayed in all branches of mathematics and science
- **Spatial:** the ability to hold in your head a model of the organisation of the world around you
- **Musical**
- **Bodily/kinesthetic:** shown, for example, by dancers; the use of the whole or parts of the body to fashion some product or performance
- **Interpersonal:** awareness of how to get along with others
- **Intrapersonal:** self-knowledge
- **Naturalistic:** ecological
- **Spiritual:** unitive, meaning-giving, contextualising and transformative

Howard Gardner: 'Frames of Mind'

Futurist Sohail Inayatullah has also championed the notion of many different intelligences, or ways of knowing. These are important for outstanding leadership in the 21st century, because to be successful, globalisation must take account of diversity.

The world economy might at the moment appear quite rigidly set in the Western, capitalist mould – as exemplified by the US – but this is increasingly coming under challenge.⁶ Aside from the activities of anti-globalisation groups in the developed world, opposition is also mounting in the developing world. The demolition of New York's World Trade Centre and subsequent terrorist atrocities have certainly generated a higher than usual level of debate, and soul-searching, in Western nations, about the way the world – including its economy – functions.

Difficulties will arise for Australia if we continue to follow strategies practised by American corporate or political leaders, because they fail to take account of conditions peculiar to Australia and other countries, and are essentially rational, or intellect-based. This means they also fail to take account of uncertainty, chaos and complexity, and place limitations on all the other ways through which we experience and understand the world, such as intuition, instinct, and personal relationships – emotional intelligence, or 'EQ'.

This really does have serious commercial ramifications. Among the reasons why David Warren's black box was of no interest to Australian government and business leaders was because they failed to envision how air travel would, as it were, take off as an industry (despite Australia being subject to 'the tyranny of distance'), and because of their parochial, not to mention arrogant, conviction that, because air accidents would not occur in Australia, a flight data recorder had no future.⁸ Apart from being unimaginative in the extreme, this conviction could be construed as tempting fate – an admittedly emotional response, and one which people with EQ would have felt inside, 'in their gut'. Had it been heeded, Australia might have earned a great deal of wealth and a position at the forefront of the nascent aviation technology industry, like another small country, Sweden.

Sadly, we continue to this day to miss out on the full financial rewards of our R&D. For instance, a small Australian company, Permo-Drive Technologies, which claims to have discovered a way of making vehicles a staggering 30 to 40 per cent more fuel-efficient, has not been able to find an Australian financial backer. The US military, however, has stepped into the breach, recently signing a development agreement with the company.⁹

As alluded to earlier, not all the significant dangers involved in the 'follow the (foreign) leader' scenario are economic. It is worth considering whether Australia's government acted wisely when it so promptly followed the US and Britain in publicly backing the more contentious aspects of the United States' war on terror.¹⁰

The 'follow the leader' scenario could ensure Australia becomes an irrelevant player in the global arena.

SCENARIO 2: BORROW THE LEADER

Why build your own when you can import one ready-made from overseas?

This argument might be valid when the desired product is a Louis XIV chair – but deeply questionable when it's the boss of Australia's biggest resource company (BHP Billiton). Or our biggest retail group (Coles Myer). Or our biggest telecommunications provider (Telstra).

In this scenario:

- it is accepted wisdom that an organisation requires a strong, visionary leader in control of a strong, bureaucratic structure in order to succeed
- it is accepted that such a leader cannot be home-grown
- Australian organisations will continue to seek CEOs from overseas
- leadership development in Australia remains America-centric
- the brain drain of potential Australian leaders to foreign-based organisations continues and possibly gathers pace
- self-limiting beliefs persist – Australians are not and never will be as good as 'them' (North American leaders such as BHP's Paul Anderson or a whole raft of bosses at Coles Myer)
- non-Australian corporate cultures will be borrowed along with the leader
- organisational change programs mimic those overseas and lack flexibility to respond to Australian conditions; they fail to embrace and capitalise on Australia's multicultural society.

We all know a lot about IQ. But, how many of us know a great deal about EQ and SQ?

The US is the world's economic powerhouse, but this should not be taken to mean that all its corporate practices should be adopted in other cultures. As those Americans who lost their pensions when Enron collapsed can attest, some of its corporate practices should not have been adopted in the US. Australia should not, of course, take the xenophobic route of rejecting anything simply on the basis of its

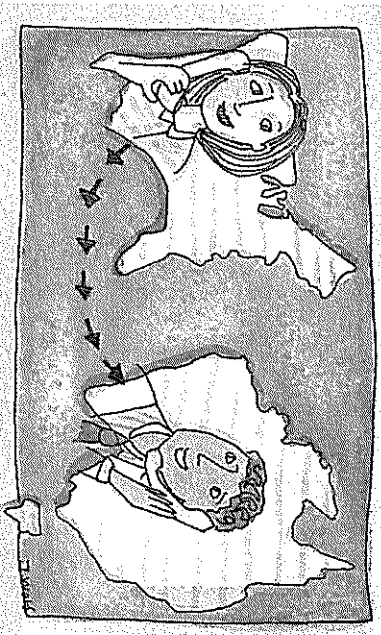
being foreign, but we should be adapting, rather than indiscriminately adopting, ideas and practices from other countries.

Adaptation is vital to survival. We know that change in any environment means that its inhabitants must also change in appropriate ways. We also know that all elements of an ecosystem must function in a particular way for it to flourish. So, extending the biological metaphor, let us return to the environment, which featured so prominently at the Sydney University symposium, and use the ecosystem as a metaphor for organisations. By doing this, we can appreciate that growth (the Australian/Western organisational paradigm) doesn't always mean building. The concept of creative destruction is a necessary component in the lifecycle of a system – much like the bushfires that rejuvenate Australia's eucalyptus forests. Destruction leads to creation – the natural eco-cycle of the Australian bush.

Drawing from this biological metaphor, the most desirable future leadership scenario invites Australian leaders in particular to think about what they need to deliberately destroy – stop doing – to rejuvenate the Australian corporate environment. This also means the ability to realise that a healthy organisation has elements in all phases of the eco-cycle simultaneously.

SCENARIO 3: DISCOVER THE LEADER

Ultimately, it all comes down to one question: 'what makes a successful organisation?' Not so long ago, a CEO could point to profit, share price or key performance indicators (KPIs) as evidence of corporate success. But the bar has been lifted. Today, the answer must take account of factors beyond the narrow borders of the free market economy. Social and environmental issues demand the attention of corporate leaders as never before.



However, a higher bar should not be viewed as an insurmountable obstacle. Rather, as Chris Sykes contended at the Sydney symposium, it should be seen as an opportunity to help produce a leadership style that is transformational; one that is uniquely Australian yet

It is worth considering whether Australia's government acted wisely when it so promptly followed Britain's lead in publicly backing the more contentious aspects of the US' war on terror.

capable of functioning to the nation's benefit within the global economy. Our leaders should ask themselves how they should change in

order to create a 'leadership – Australian-style', which would facilitate a future in which Australia:

- develops a unique leadership style suited to its own character and needs, and to its position in the Asia-Pacific region. Such a style could centre on the world view implicit in 'productive diversity', a new Australian model for work and management described by its authors, Bill Cope and Mary Kalantzis, as 'an act of strategic optimism.'¹¹
 - Karen Morley's article in this edition of the *Mt Eliza Business Review* further explores this concept
 - has leaders who excel in the quadruple bottom line – who are judged on returns on human, social, and natural capital as well as share value
 - has leadership development schools rated as among the world's best
 - has leaders committed to learning, and continuously developing and challenging themselves
 - nurtures leaders who constantly seek feedback about their impact on others (both individuals and groups), and take steps to improve themselves and the perceptions others have of them
 - has leaders who behave consistently, and from an acknowledged value base
 - has leaders who adopt a leadership style appropriate to the requirements of the organisation, the team and the task
 - develops leaders who can deal with the ambiguity and complexity of current organisational demands
 - rewards leaders who are action-oriented.
- Scenario 3 asks Australian leaders to always to be conscious of, and seeking answers to, several questions: What is the *purpose* of leadership in Australia? How does Australian leadership add meaning to Australian lives? How do Australian leaders show they understand different ways of knowing and care for all Australians as well as others in the global village? How will Australians know when they have great leadership?
- One possible way of answering the last question would be to use as a benchmark the principles

- espoused by someone generally acknowledged to be an outstanding Australian leader. Lieutenant-General Peter Cosgrove, 2001 Australian of the Year, commander of Australian forces in East Timor and now head of the Australian Defence Force, has described what he considers to be the six main prerequisites for leadership:
- **Ethics:** the most important of all. Integrity, not expediency, should underpin all decisions. In the long run, this will be discerned, by others and will yield the best results
- **Courage:** moral courage in particular, which should go hand-in-hand with tenacity, the will to follow through on a decided course of action
- **Compassion:** compassion for fellow human beings and, particularly, the ability to demonstrate it, and elicit it in others. Cosgrove emphasised that with compassion comes weighing the cost, particularly the human cost, of all that we do
- **Humility:** we are all on life's journey together, and humility goes hand-in-hand with compassion. The general stressed that while some believe in leadership as a final destination and perfectible achievement, he believes leadership is a journey and

- no-one can ever truly perfect it – all leaders must remain open to learning
 - **Observed experiences and communication:** Cosgrove explained that it is critical that good leaders have exceptional powers of observation and perception, and that their communication skills are honed and used continuously. It is important not to adopt a 'follow me' approach, but to transmit the message clearly
 - **Incurable optimism:** The general said that, although he believed he was by nature a pessimist, he also felt that when in a leadership role, he should, and did, express optimism.¹³
- The holistically oriented 'discover the leader' scenario, the emerging importance of EQ and SQ, and such ideals of leadership as expressed by Cosgrove, necessitate a new strategic conversation for Australian organisations. Figure 2 is my attempt at a more effective model for achieving sustainable futures. It incorporates anticipatory action learning, and draws on the work of Sohail Inayatullah, Richard Slaughter, Richard Bawden, Edgar Schein, and Malcolm Davies.
- Figure 2 shows leadership as a non-rational process, now associated more than in the past with EQ and

Figure 2
Learning in the unknown

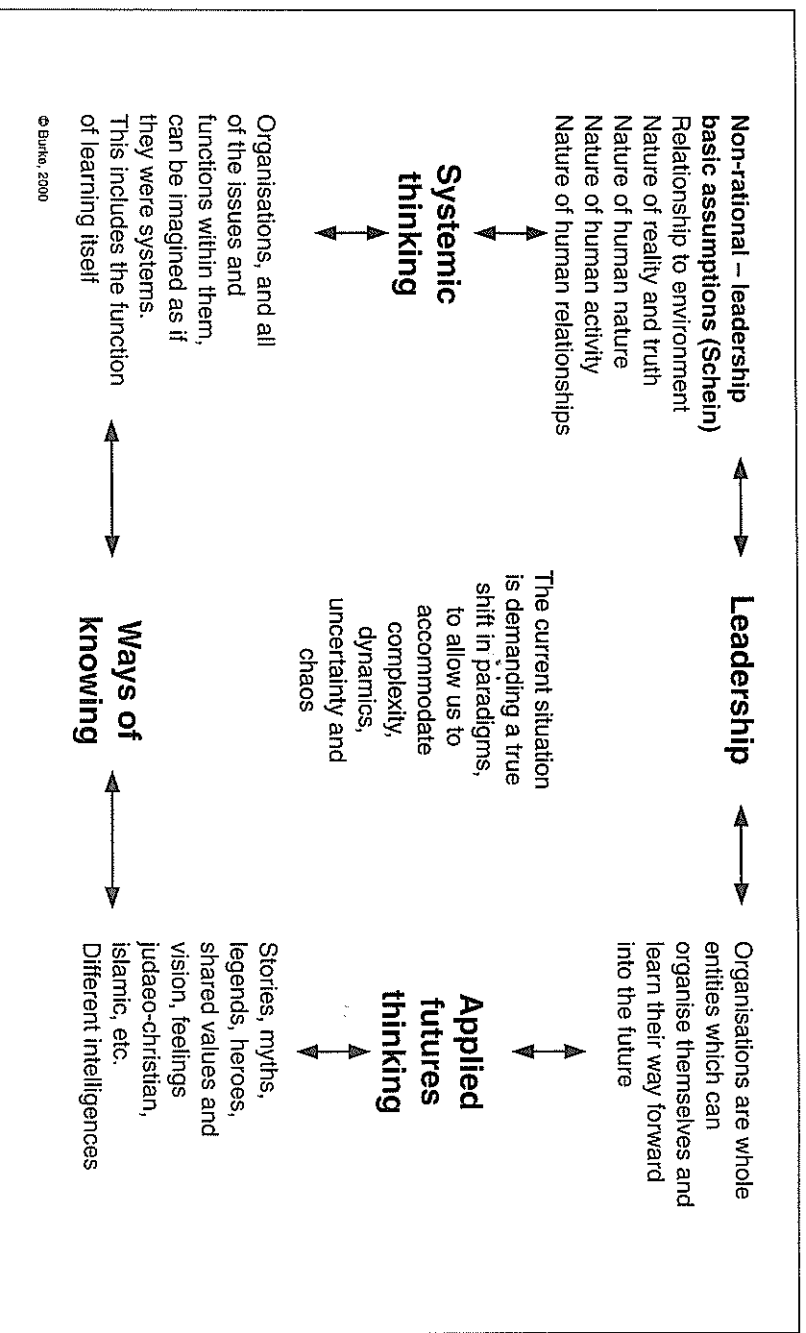


Figure 3
Knowledge and ignorance

Know	Certainly	Don't know
<p>TYPE 1 What you know Day-to-day given reality Uncontested – accepted Forecasts – data</p>	<p>TYPE 4 What you don't know Day-to-day given reality Study – trends analysis Learning from others – being conscious</p>	
<p>TYPE 2 What you know you know Reflection Science especially testing of hypothesis High degree of certainty – information</p>	<p>TYPE 5 What you don't know you know Unconscious understanding Superconsciousness Intuitive foresight – wisdom</p>	
<p>TYPE 3 What you know you don't know Scenarios are the most useful tools as they help contour uncertainty – frame areas of ignorance Knowledge</p>	<p>TYPE 6 What you don't know you don't know Only way of knowing this is by entering other ways of knowing, moving outside comfortable paradigms. Epistemic futures The problem of consciousness – enemy, friend or transcendence</p>	
Uncertainty		
Source: Inayatullah		

spiritual intelligence, or SQ. IQ is common to all, but more directly related to management or rational processes, which often results in the use of a linear deterministic methodology. It illustrates that EQ and SQ use different neural patterns (tracts) in our brain, which better equip us for dealing with complexity and chaos.

This model supports the Mt Eliza leadership model (page 8) in that it offers an implementation pathway that the 'discover the leader' scenario could follow.

Today, many people have difficulty recognising leadership in business. From the literature, it appears leadership in business is considered only in terms of increasing shareholder wealth or meeting KPIs. As an Australian witnessing the downfall of one of our national icons, Ansett Airlines, as well as companies such as HIH Insurance and One.Tel, I was amazed to see many of the CEOs and senior managers of these failed enterprises receiving huge bonuses based on achieving KPIs. Ansett's CEO, Gary Toomey, was one of them, despite the fact that the company was disintegrating around him at the same time.

There are examples of extraordinary, original and identifiably Australian leadership that support the

'discover the leader' scenario. An outstanding one is that of Ian Kiernan, founder of Clean up Australia. Kiernan now has a Clean up the World movement, with 40 million volunteers in 120 countries spending one day a year on spring-cleaning the globe.

Kiernan's "is an organisation for its time," says Wendy McCarthy, the former head of the Australian Heritage Foundation. "It does not agonise in the way many other environmental organisations do. It just gets on and gets into it." This has to a great extent been made possible by Kiernan's adoption of both a rational (scientific) approach and a non-rational (humanistic) approach – IQ plus EQ and SQ.

The 'discover the leader' scenario emerges from the Mt Eliza leadership model developed by Karen Morley. It affords Australians the opportunity to re-examine their place in the global village and provide appropriate and inspirational leadership of quality, credibility, and courage.

The 'discover the leader' scenario will result in us developing and marketing our discoveries in a superior fashion through the process of transforming our thinking and our planning methodologies, through destroying the power of the 'cultural cringe' mindset.

The recommended approach for bringing the 'discover the leader' scenario into being is applied futures thinking. In the current environment of change, complexity and uncertainty, this alternative is preferable to the traditional rational, left-to-right model of strategic planning. Key elements are:

- understanding the current drivers of change and emerging trends – economic, business, technological, social, political and ecological
- assessing the impact of these drivers on Australia and its leaders
- developing alternative scenarios of the future, including the 'discover the leader' scenario, and assessing how each will impact on Australia and its organisations
- assessing Australia's current leadership and production capabilities and identifying any shortfalls
- developing a vision for Australia's preferred future and creating a new story around this vision
- through backcasting, creating a history of the preferred future.

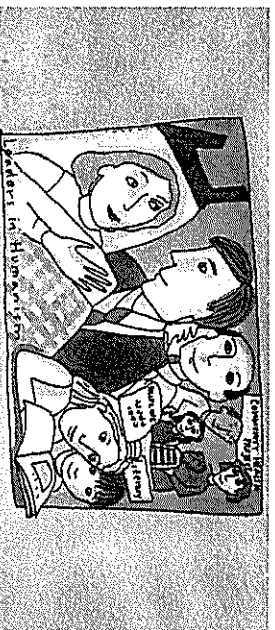
Of course, nothing succeeds like success. The rewards reaped by organisations that operate in accordance with the 'discover the leader' scenario will provide proof of its efficacy, and should convince others to do likewise. By contrast, organisations which fail to

make appropriate adjustments to the changing global economic and political environment will pay a heavy price. As will we all, because Australia comprises myriad interdependent parts. Like an ecosystem, failure in any of these will adversely affect the whole.

We need to develop leaders who recognise the need for holistic solutions, who have the intestinal fortitude to discard the 'cringe' and related false perceptions about our capabilities, who can identify and implement policies and practices which are best suited to maintaining the stability and prosperity of this country.

As the Sydney symposium was told:

- No Vision – No Victory
- No Guts – No Glory
- No Webs – No Wins



ENDNOTES

1. Narelle Kennedy, CEO Australian Business Foundation, speaking at a University of Sydney symposium, *Governance and Innovation: Beyond the Australian Predicament*, 24th July 2002. ('Webs' refers to the interconnectedness of all things – organisms, social systems and ecosystems.)
2. S S Schaefer puts it this way, 'Colonial Cringe is a type of national inferiority complex which manifests itself in a number of ways, eg appeals to the overseas expert, the slating of local endeavours and so on....' He gives as another example that: 'Several laboratories had promising hardware in development. But the Menzies government stopped financing new computer developments and we are now spending some \$27 billion per year on imported data processing equipment and software.' From, 'When the Chips are Down', *Sydney Morning Herald*, 18 May 1996.
3. Details from the Defence, Science and Technology Organisation. For more information, visit: <http://www.dsto.defence.gov.au/index.html>.
4. 'Colonial Cringe and Clever Australia', *ATSE Focus*, No.94, Nov/Dec 1996.
5. Australia's Chief Scientist, Robin Batterham, spoke at the Sydney University symposium on 'Australia – One of the World's Real Leaders in Sustainability'; the Research Director of ResMed, Bob Frater, described how Australia could be 'No 1 in Salinity Control and Greenhouse Control'.
6. See AC Ping, 2002 'Reinventing corporate governance after 2001: A question of trust', *Mt Eliza Business Review*, vol 5 no 1.
7. J. Macken commenting on Sohail Inayatullah, *Weekend Australian Financial Review*, 1 January 1999.
8. Defence, Science and Technology Organisation: <http://www.dsto.defence.gov.au/index.html>.
9. 'New Australian Invention Claims 40 per cent off Fuel Bills', *7.30 Report*, ABC TV, 2 September 2002.
10. For example, in the wake of the Kuta terrorist massacre, the Howard Government was reported to be 'worried that it will draw the charge that its forthright support for the Bush Administration's Iraq posture might have provoked the Bali attacks', by Lincoln Wright, 'Regional threats likely to become priority', *The Canberra Times*, 15 October 2002.
11. Bill Cope and Mary Kalantzis, 'Productive Diversity – A New, Australian Model for Work and Management', Pluto Press, Sydney, 1997.
12. R. Barner, R, 2000 'The New Career Strategist: Career Management for the Year 2000 and Beyond', *Exploring Your Future*, ed E. Cornish, World Future Society, USA.
14. Rotary Luncheon Address, Melbourne, 30 May 2001
15. Peter Checkland, 'Systems Thinking, Systems Practice', Wiley, 1999.
16. <http://www.achievers-odds.com.au/topachiever/ikiermanfull.htm>
17. <http://www.sfasu.edu/polisci/abel/142/>

Appendix

100 years of Australian innovation (incomplete list)

- 1906: Feature Film**
The Story of the Kelly Gang was the world's first feature length film.
- 1907: Xerography**
 The key technology for the invention of xerography was developed by Professor O U Vonwiller at the University of Sydney. It was a method of photographic copying which formed the basis of Xerox copying.
- 1915: Aspro**
 While the German firm Bayer first produced aspirin, a Melbourne pharmacist George Nicholas and experimenter, Henry Woolf Smith produced a high-grade aspirin product, 'Aspro', that later took over the international market.
- 1918: Anthrax Vaccine**
 John McGarvie Smith donated his secret discovery of an anthrax vaccine to the NSW Government shortly before his death.
- 1926: Heart Pacemaker**
 A doctor from the Crown Street Women's Hospital in Sydney, who wished to remain anonymous, invented the original pacemaker in Australia.
- 1947: Cloud Seeding**
 Scientists at CSIRO conducted the first successful cloud seeding experiments, making rain fall near Bathurst, NSW.
- 1952: Atomic Absorption Spectrophotometer**
 Sir Alan Walsh of the CSIRO invented this instrument used for high speed chemical analysis of metallic elements.
- 1953: Solar Water Heater**
 The first prototype of a solar water heater was developed at CSIRO in Victoria.
- 1957: Permanent Crease Trousers**
 The process of producing permanent creases in fabric was developed by Dr Arthur Farnworth of CSIRO by adding a special resin to wool fibres to change their chemical structure.
- 1958: Black Box Flight Recorder**
 Dr David Warren in Melbourne invented the first black box flight memory recorder. The unit recorder the pilot's voice and a few instrument readings.
- 1961: Ultrasound**
 George Kossoff and David Robinson built the first ultrasound scanner at the ultrasonics institute in the Commonwealth Department of Health.
- 1970: Microsurgery Pioneered**
 Professor Earl Owen from Sydney pioneered microsurgery techniques by performing the first microsurgery operation when he rejoined an amputated index finger.
- 1973: Pop Top Can**
 Sir Ian McLennan of BHP came up with the idea of press-buttons where the button is hinged to the can and does not cause a litter problem.
- 1973: In-vitro Fertilisation**
 The world's first pregnancy using IVF technology was reported from Monash Medical Centre.
- 1975: Interscan**
 An aircraft approach and landing guidance system using microwaves was successfully tested at Tullamarine Airport, Melbourne.
- 1979: Bionic Ear**
 The cochlear implant, designed to help the hearing impaired and profoundly deaf, was invented by Professor Graeme Clark of the University of Melbourne.
- 1984: In-vitro Fertilisation**
 The first frozen embryo baby was born in Melbourne using a technique developed by Dr Alan Trounson and Dr Linda Mohr.
- 1985: World's Most Efficient Solar Cells**
 Dr Stuart Wenham and Professor Martin Green from the University of New South Wales produced the world's first 20% efficient solar cell.
- 1986: Gene Shears**
 The discovery of gene shears - molecules used to remove harmful and unwanted genes in plants and animals - was made by CSIRO scientists, Dr Wayne Gerlach and Dr Jim Haseloff.
- 1987: Wave Piercing Catamaran**
 Ship builder Incat Australia Ply Ltd designed a low buoyancy bow which helps the catamaran pierce through waves, resulting in a faster and smoother journey.
- 1988: Plastic Banknotes**
 CSIRO and Note Printing Australia developed the world's first polymer banknote made from tough flexible polypropylene plastics. These notes last longer and are more difficult to counterfeit than paper money.
- 1990: Reading Machine for the Blind**
 Mian Hudecek of Melbourne invented the world's first reading machine for the blind.
- 2000: Biodegradable Packaging**
 The Cooperative Research Centre for International Food Manufacture and Packaging Science developed new biodegradable packaging materials based on starch.

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