

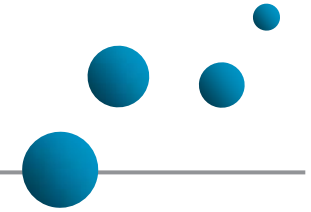


Science and Technology-Led Innovation in Services for Australian Industries

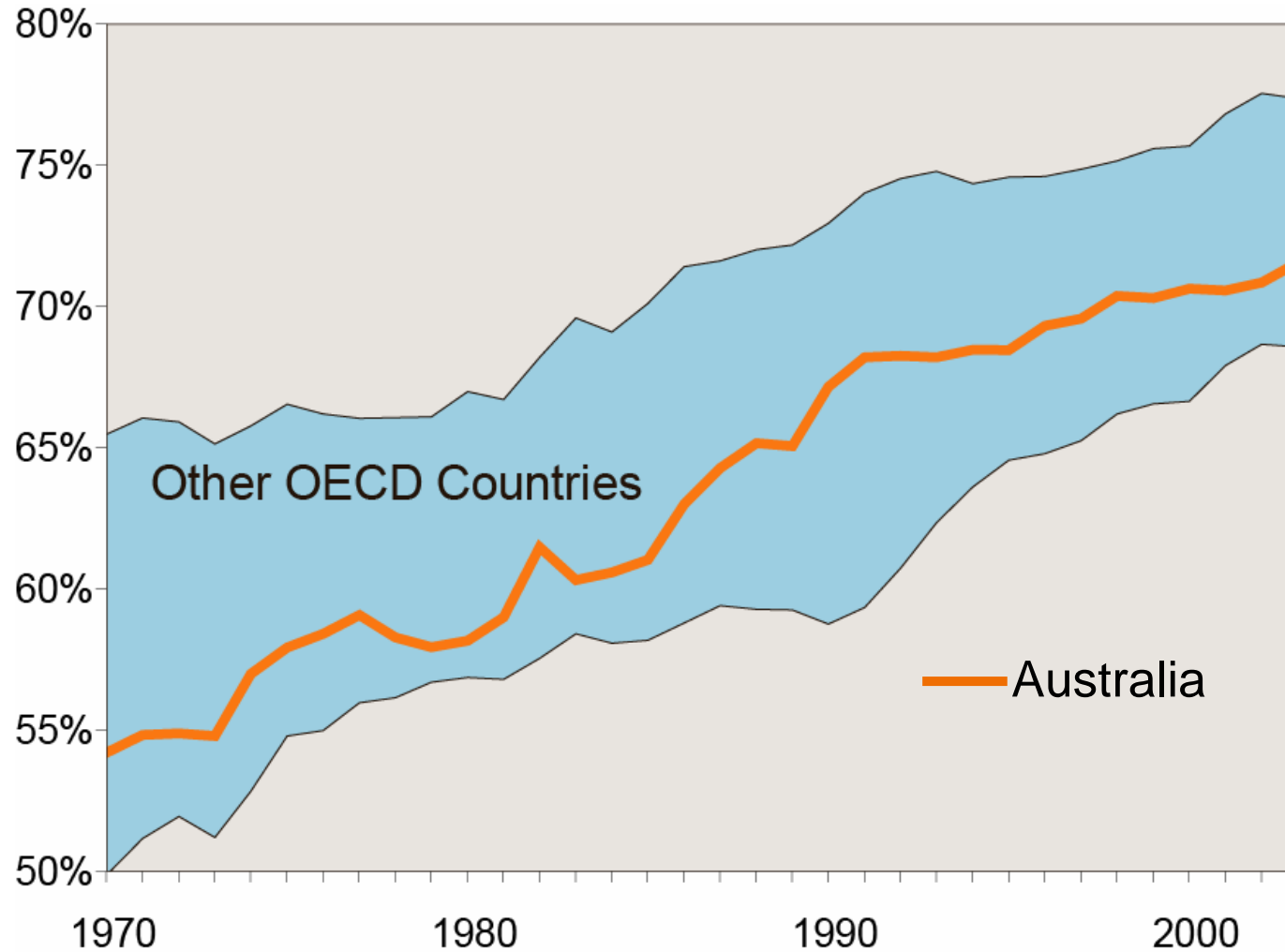
Report of the PMSEIC Working Group

Wednesday 23 April 2008

The services revolution



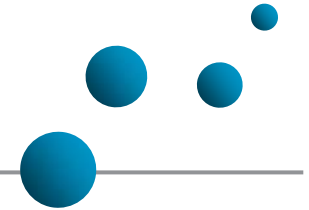
Services as a % of Industry valued added*



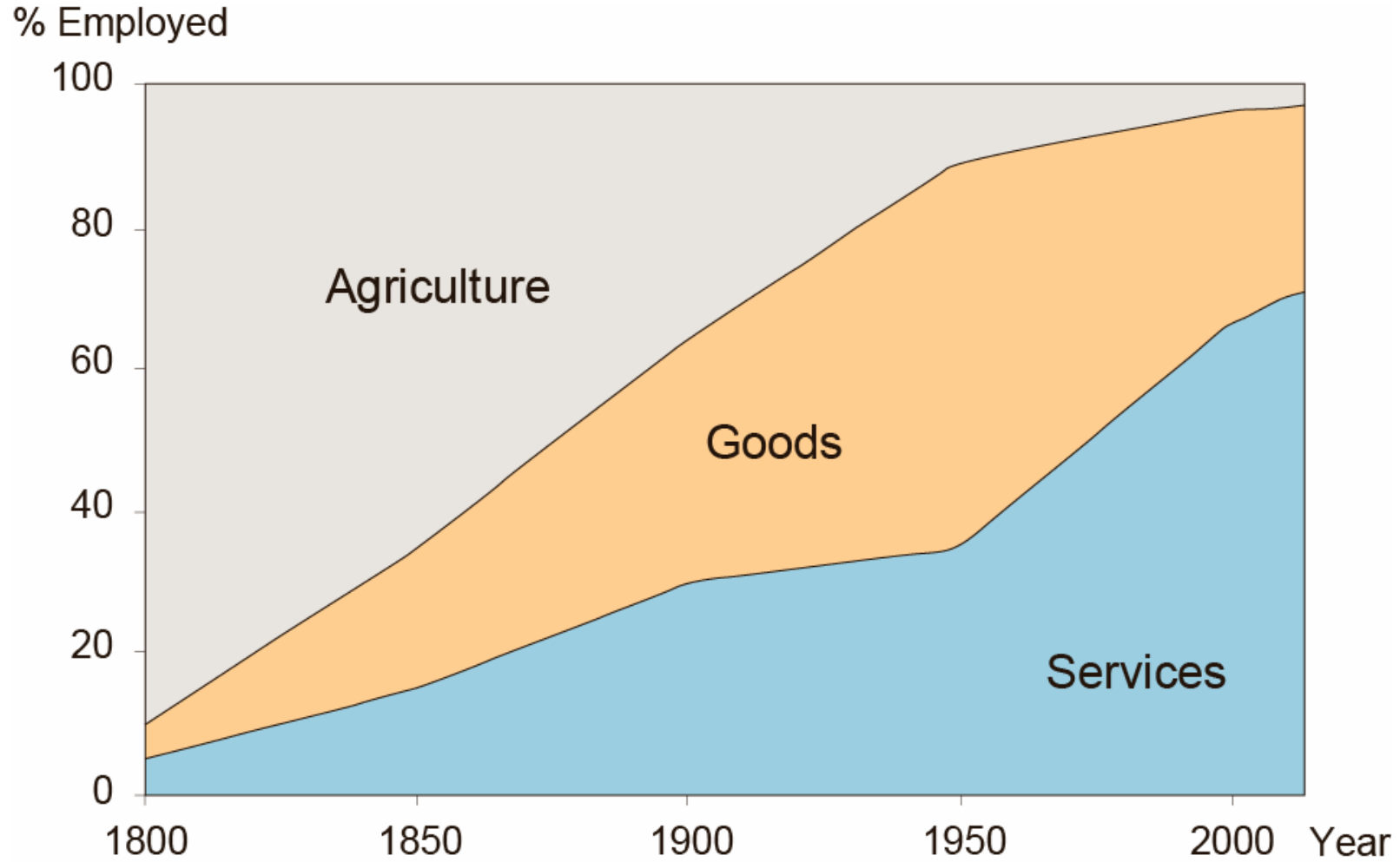
*OECD data used for this graph does not include construction, gas and electricity

Source: OECD, STAN Indicators, 2005

The services revolution

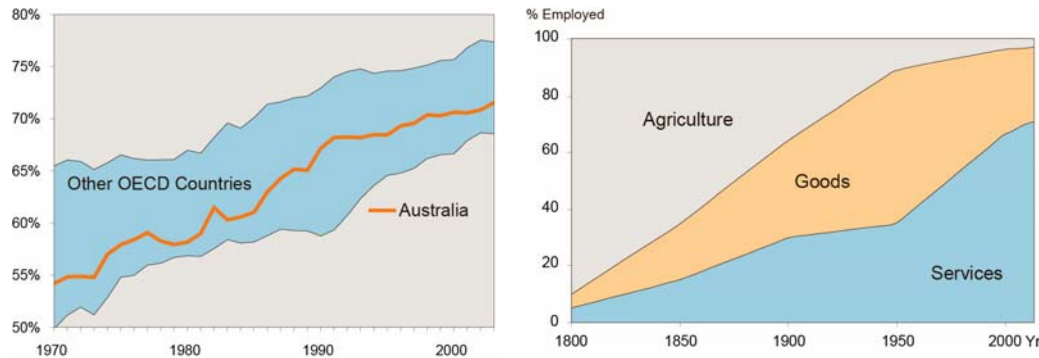


Sectoral employment trends in developed countries



USA data. Source: Spohrer, 2007

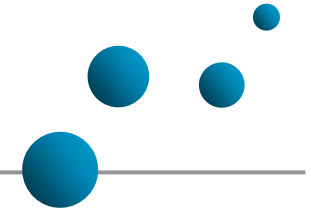
The services revolution



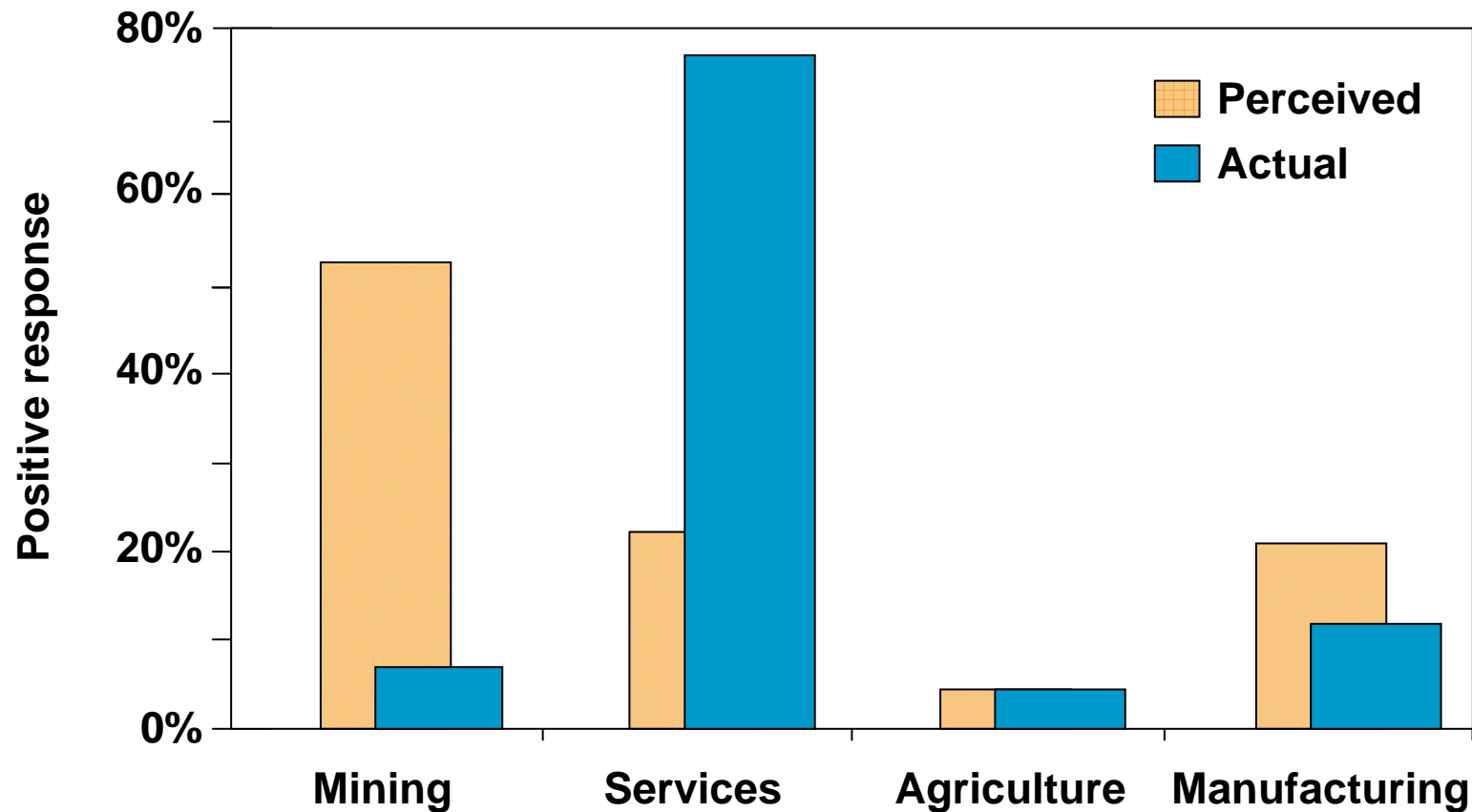
“The shift towards services is not simply a US phenomenon or a developed nation’s phenomenon ... the shift to services represents the single largest labour force migration in human history.”

- Jim Spohrer, IBM, 2007

At the core of the challenge?



Q: Which do you think makes the greatest contribution to the Australian economy?



Source: Market Research Australia

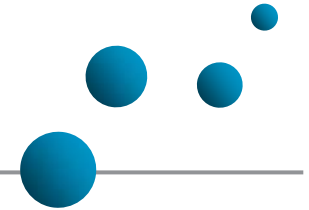
Our agenda today

✓ The services revolution

● Our brief, our task team, our headlines

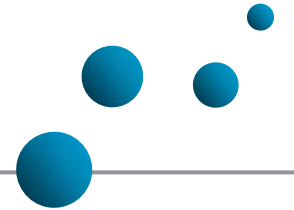
- Services and the economy
- S&T and services innovation
- How is Australia positioned?
- Barriers to progress: our recommendations
- A glimpse of the future

Our brief, in brief



- Investigate the character of services innovation; and
- How it contributes – now and in the future – to creating competitive advantage;
- Identify the particular distinctive contribution from our S&T base – and how to improve it.

Our task team



Dr Murray Cameron
Division Chief
CSIRO



Mr John Harvey
Executive
IBM Australia/
New Zealand



Dr Leanna Read*
Managing Director/CEO
TGR BioSciences
Pty Ltd



Dr Rosalind Dubs
Deputy Vice-
Chancellor
University of
Technology Sydney



Ms Narelle Kennedy
CEO
Australian Business
Foundation



Mr Neville Sawyer*
Immediate past President
Australian Chamber
of Commerce and Industry
(Deputy Chair)



Dr Geoff Garrett*
Chief Executive
CSIRO
(Chair)



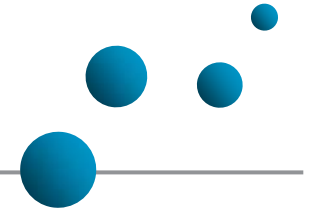
Ms Sheryle Moon
CEO
Australian Information
Industry Association



Prof. Arun Sharma
Deputy Vice-Chancellor
Queensland University
of Technology

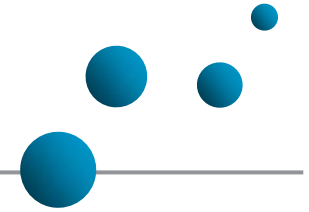
* PMSEIC member

We will be recommending...



- S&T led services innovation as an important national priority
- Better connecting our service industries with our S&T base
- Addressing the growing skills shortage in this area
- How government can help

Our agenda today



- ✓ The services revolution
- ✓ Our brief, our task team, our headlines

● Services and the economy

- S&T and services innovation
- How is Australia positioned?
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What are we talking about?



- Simply put, 'services' are...

***“Anything you can’t drop
on your foot”, or***

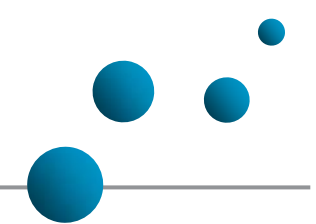
***“Anything you can’t put in
a box and ship”, or***

- John Harvey, IBM

***“People doing something for other
people for value”***

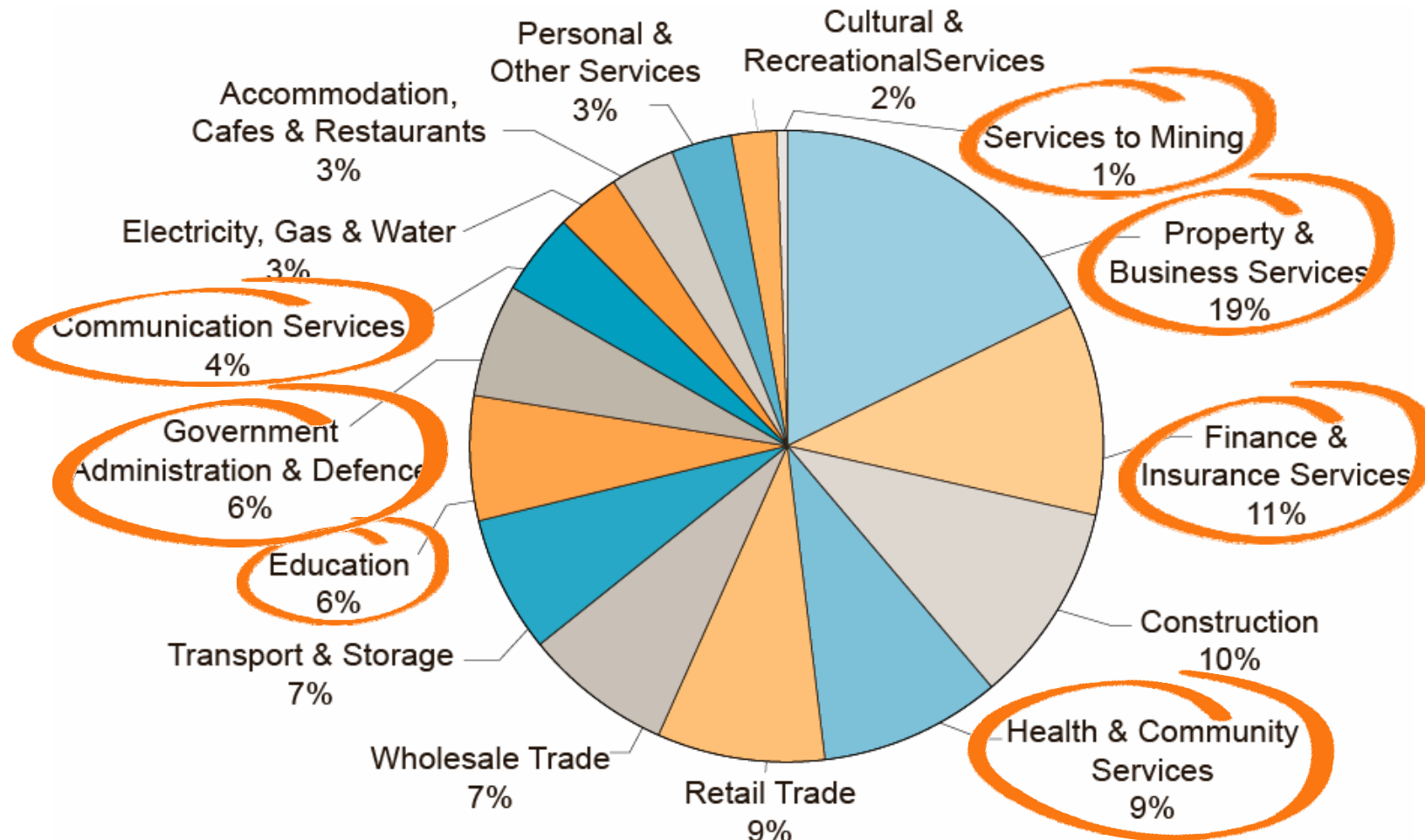
- Ravi Namane, UCalif Berkeley

A breakdown of this 80% of our economy...



 = KIS

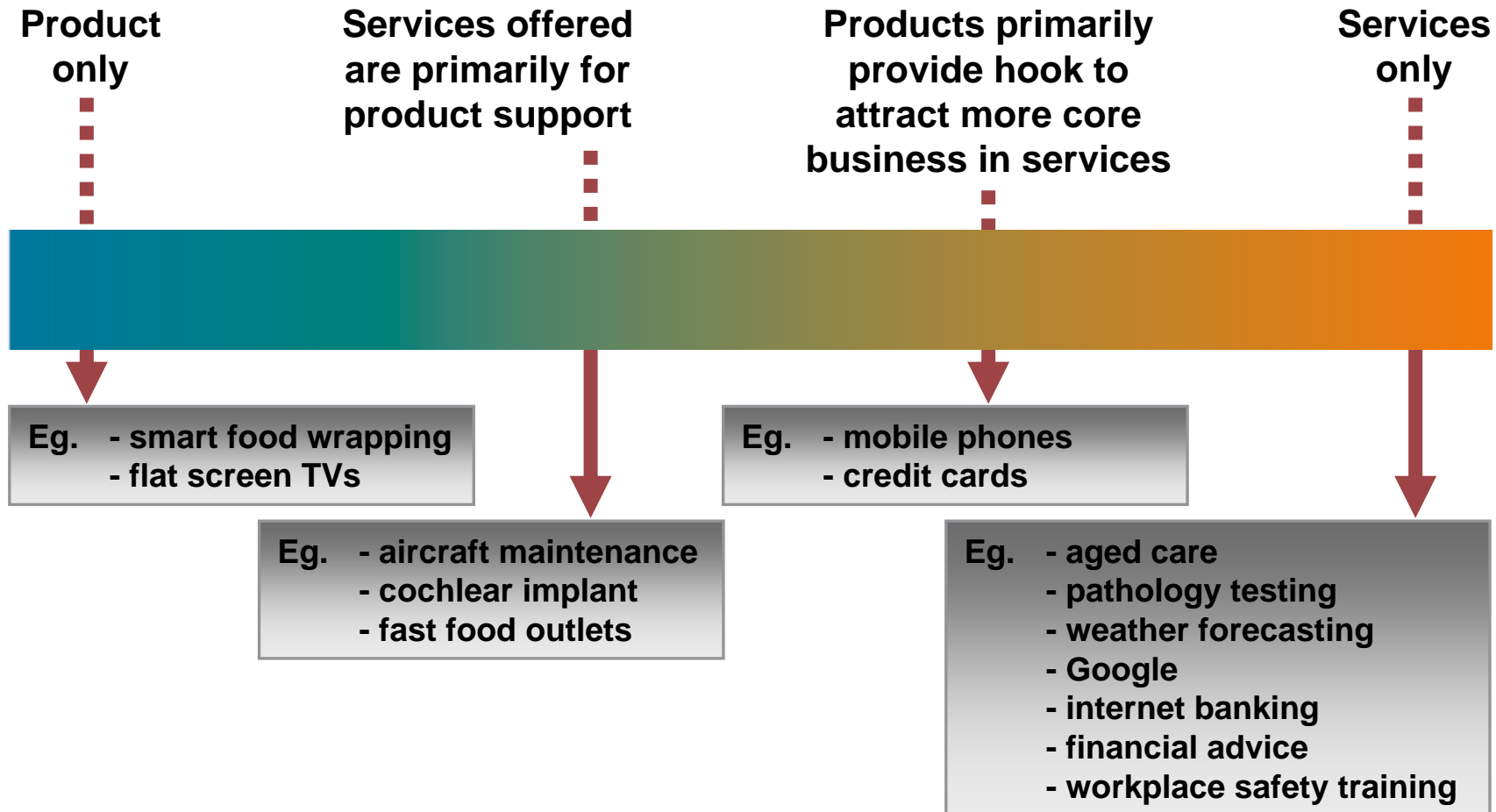
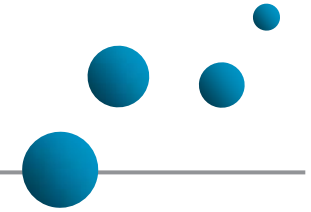
Services gross value added



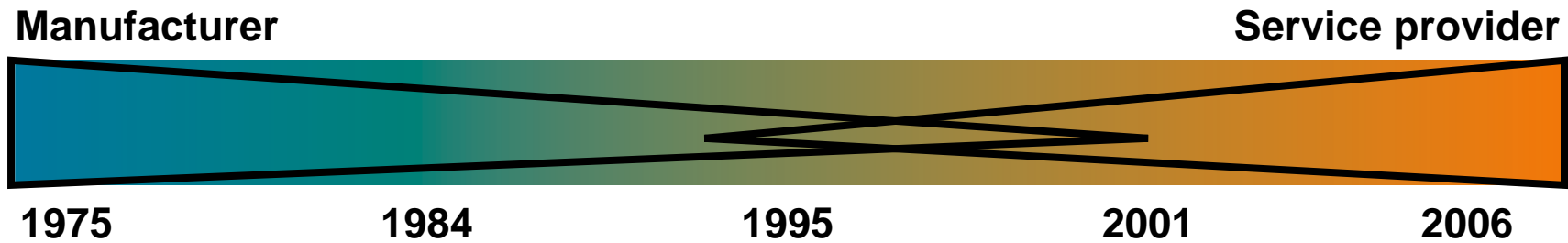
*Services gross value added, i.e. the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production.

Australian Bureau of Statistics, 2006

The 'spectrum' of services...



...and the manufacturing to services migration... the IBM Australia story



1975 – Electric typewriter manufacturing plant launched in Victoria

1984 – PC manufacturing (one of IBM's firsts)

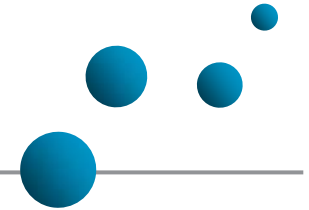
1995-1998 – IBM services exports rose 190% (\$70m to \$203m)

1996 – Largest Australian exporter of elaborately transformed manufactured goods (\$400m exports, 545 staff)

2001 – Closed factory

2006 – IBM services exports \$576m (800% increase from 1998), staff increase 457 to 1420

Our agenda today

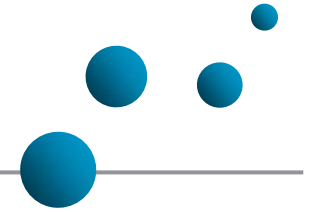


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- ✓ Services and the economy

S&T and services innovation

- How is Australia positioned?
- Barriers to progress: our recommendations
- A glimpse of the future

A leap-frogging opportunity for better linkage...

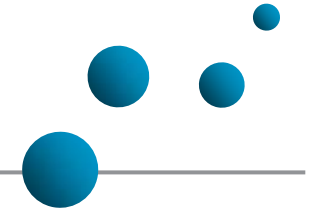


“...modern economies are both service economies and economies of innovation. Paradoxically, they are not regarded as economies of innovation in services.... It is as if services and innovation were two parallel universes that co-exist in blissful ignorance of each other.”

- Faiz Gallouj (2002)

*Innovation in the Service Economy:
the New Wealth of Nations*

Why is services innovation poorly understood?



“Innovation is ideas successfully applied”
- John Bessant, Imperial College (Innovation Summit, Melb. 2007)

- Service innovations tend to be intangible
- Service businesses innovate by adopting new knowledge and technologies



Two modes of services innovation

- Innovation in services industries
 - eg. exploration and mining services
 - eg. internet search
- Innovation through services (in any org./business)
 - eg. Satellite technology for Australian fishermen



So what about science and technology and services innovation...

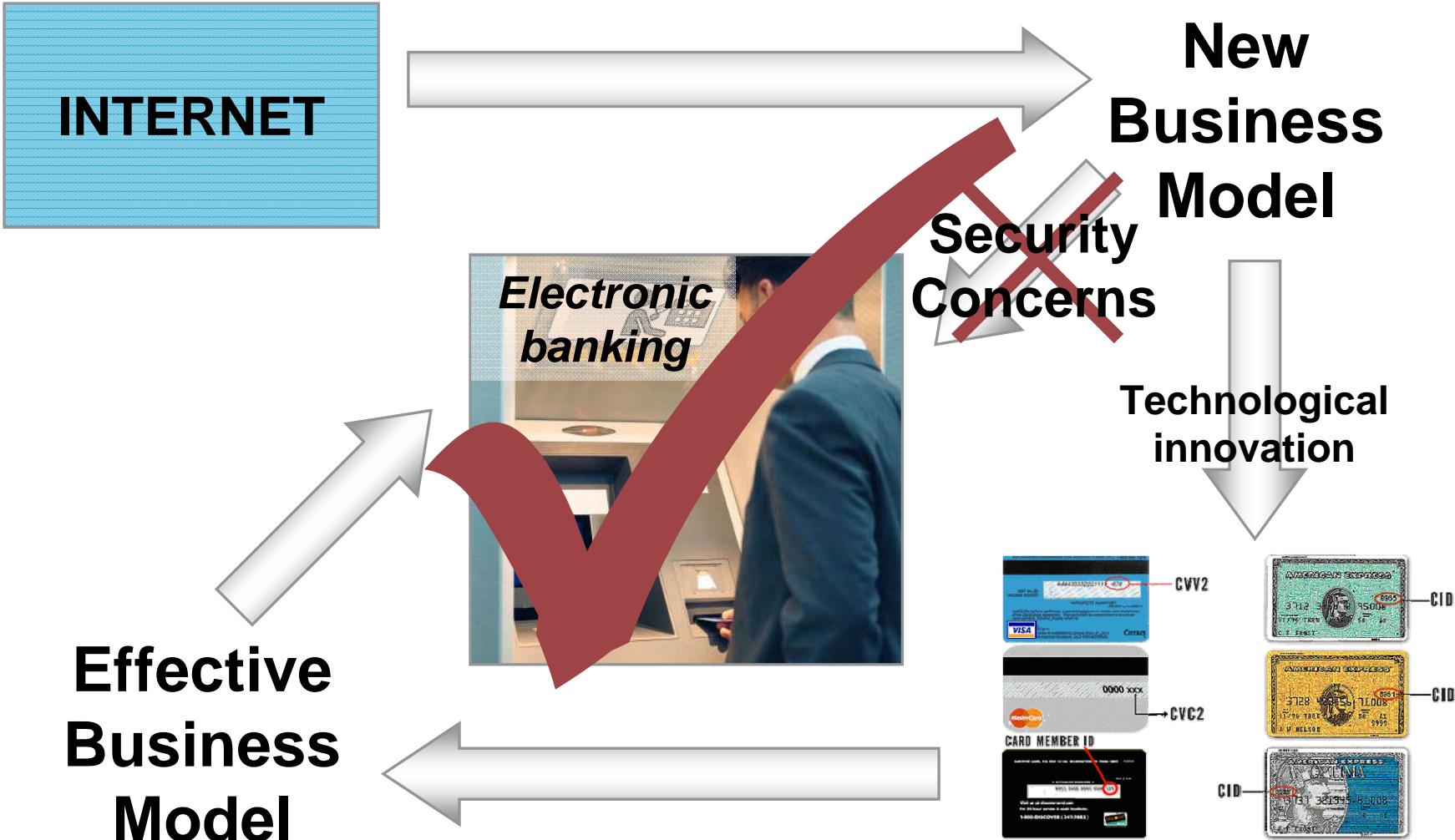
A critical direct or indirect role in many services...

- S&T services innovation can occur through:
 - development of an underpinning product or platform
 - knowledge used to develop and/or transform services
 - the method of delivering a service

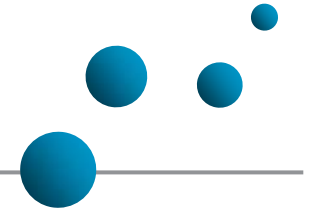


The reality is, there is a very strong interdependence between technological and non-technological innovations

For example..... Electronic banking



Our agenda today

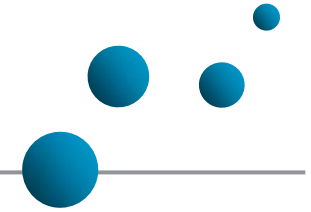


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● How is Australia positioned?

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Australia has a history of science and technology-led services innovation...



From medical care...

1928



2008



The Royal Flying Doctor Service

To entertainment...



Animal Logic Pty Ltd

Australia's key challenges



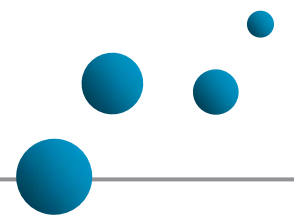
- Our domestic geographic challenge
- Services: 80% of the economy – 20% exports
- Our share of global services exports is falling

1996 ... 1.4%

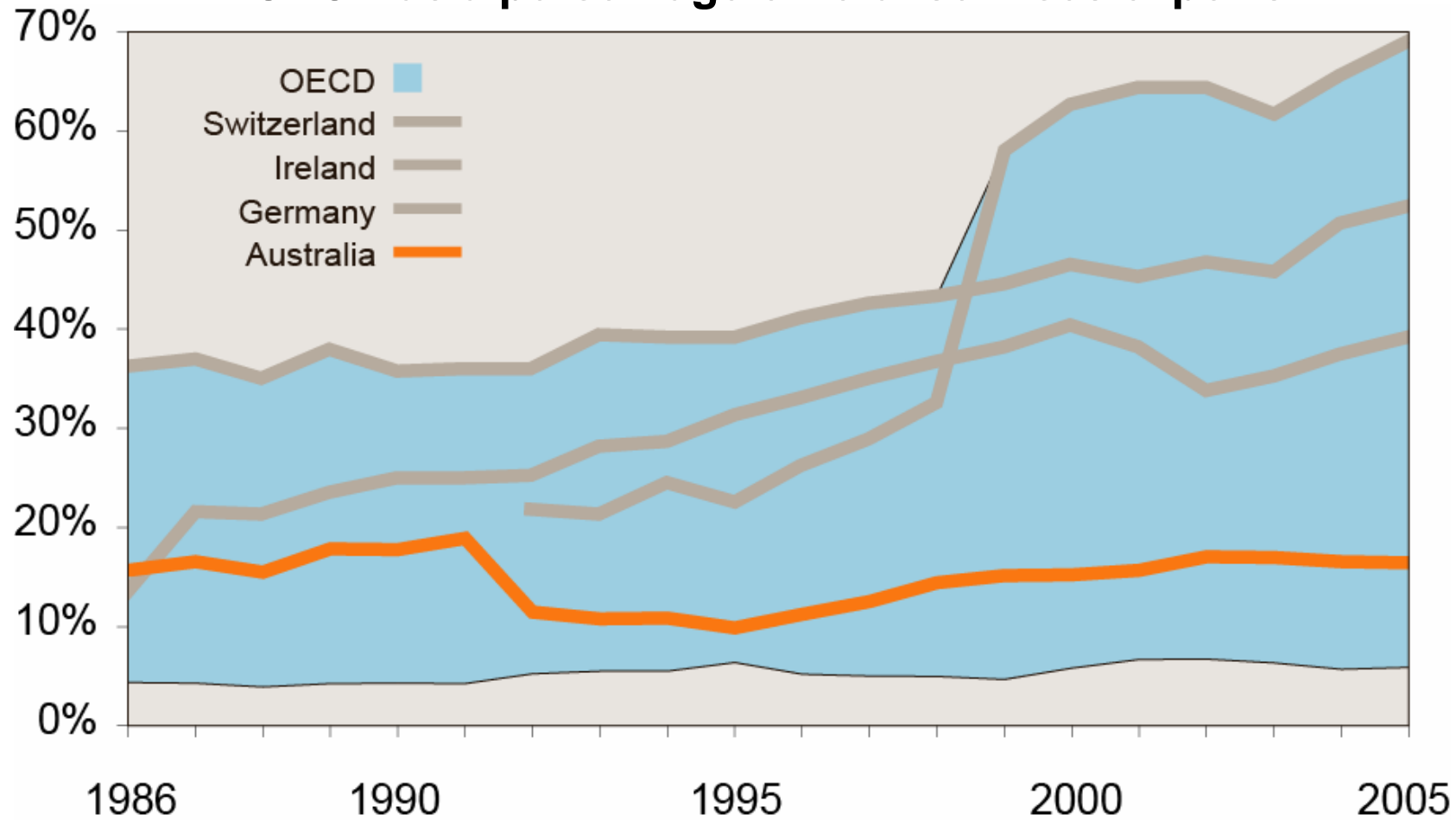
2005 ... 1.2%

= \$9.7 billion loss

Our knowledge intensive services challenge/opportunity...



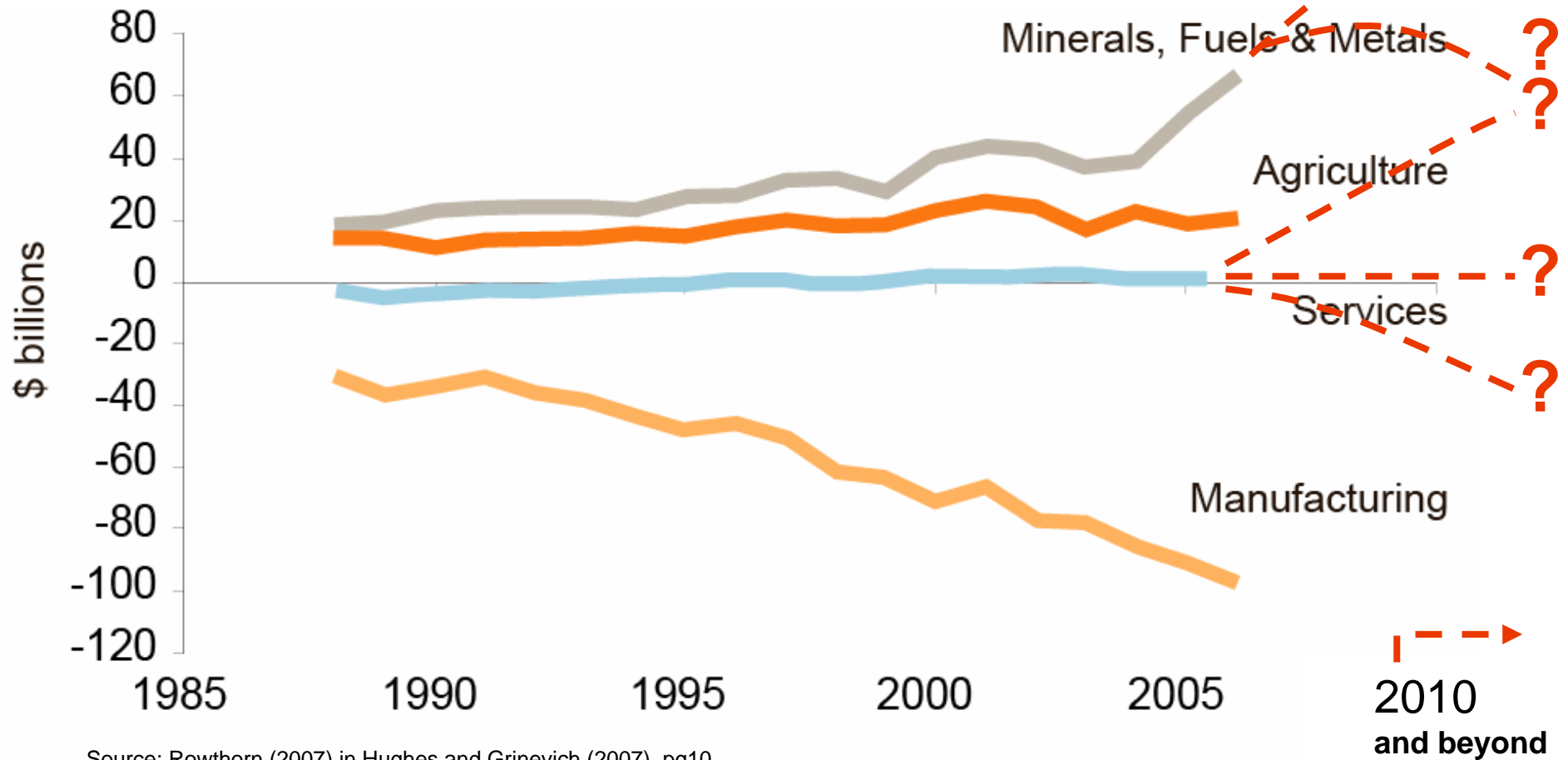
Knowledge-intensive services (KIS) exports within the OECD as a percentage of total services exports



Source: OECD, 2006

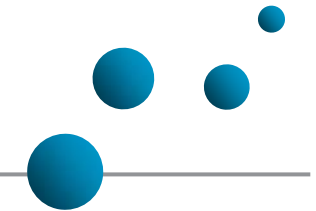
Our import/export mix...

Australian current account balance of payments 1988-2006



Source: Rowthorn (2007) in Hughes and Grinevich (2007), pg10.

And what else our competition are doing...



US Legislation on Services Science

Box 9: US Legislation on Services Science

On August 2nd 2007, the US House and Senate voted to approve (President signed on 9 August 2007):

"Sec. 1005. Study of Services Science

(a) Sense of Congress – It is the sense of Congress that, in order to strengthen the competitiveness of United States enterprises and institutions and to prepare the people of the United States for high-wage, high-skill employment, the Federal Government should better understand and respond strategically to the emerging management and learning discipline known as service[s] science.*

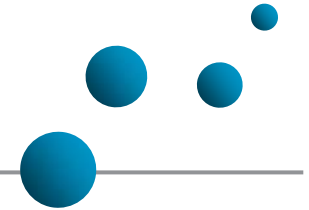
(b) Study- Not later than 1 year after the date of enactment of this Act, the Director of the Office of Science and Technology Policy, through the National Academy of Sciences, shall conduct a study and report to Congress regarding how the Federal Government should support, through research, education, and training, the emerging management and learning discipline known as service[s] science."

**Our bold*

“...the Federal Government should better understand and respond strategically to the emerging management and learning discipline known as service(s) science.”

“...shall conduct a study and report to Congress regarding how the Federal Government should support, through research, education, and training, the emerging management and learning discipline known as service(s) science.”

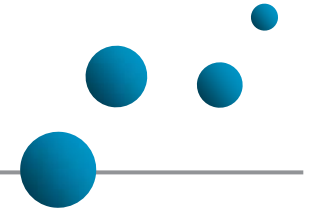
And what else our
competition are doing...



“Today, services research is the fastest growing part of IBM research – the number of people focused on services innovation has increased by more than a factor of ten over the last three years, and now accounts for more than 15% of our 3000 researchers in IBM research.”

– Jim Spohrer, IBM (2007)

What is Services Science...



- An emerging discipline that integrates:
 - Computer science
 - Engineering and design
 - Business strategy
 - Operational research
 - Social science and law
- Potential to enhance services innovation in a way that could not be achieved through these disciplines working in isolation

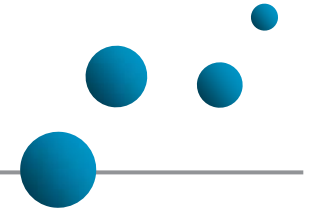
Australia's competitive advantages



- A track record of innovation
- Well respected in key S&T domains / R&D
- Educated / technologically savvy
- Stable and trusted; good business reputation
- Expertise in areas of global significance, eg. water, climate, clean energy, biotech, health

- For example: **Delivering high quality care to regional hospitals**

Our agenda today

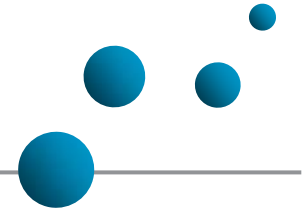


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- ✓ How is Australia positioned?

● Barriers to progress: our recommendations

- A glimpse of the future

Some barriers to our progress...



- **Lack of recognition** of (and information about) the importance of services to the Australian economy
- **Misconception** that services are not innovative
- **Poor understanding** of how services innovate

Recommendation 1

Establish science and technology-led services innovation as an important priority of Australia's National Innovation System



- Accompanying actions:
 - Expand ABS measurement to accurately benchmark contributions to Australia's economy
 - Review extent to which government innovation programs satisfy services needs
 - Raise awareness through high-profile awards

Some barriers to our progress...



- **Role of S&T** not perceived and supported
- **Products focus prevails**
- **Poor connections** to our R&D base

Only 2% of innovating businesses collaborate with higher education facilities, and only 3% with government organisations

- ABS, 2007

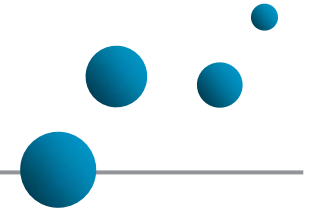
Recommendation 2

Strengthening the connections between Australian services businesses and our science and technology base

- **Realign priorities & funding** to stimulate strategic, collaborative research supporting service industries
- **Stimulate services science R&D**
- **Provide incentives** to enhance consultancy-type activity



Some barriers to our progress...



- **Relevant skills shortage** and
- **Lack of cross-disciplinary education programs**

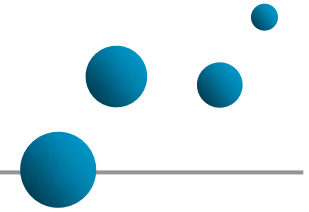
Recommendation 3

Addressing the growing skills shortage in Australian services industries

- Provide incentives and framework to:
 - establish cross-disciplinary courses
 - enable services industry employees to regularly update or expand their skills



How Government can help...



Recommendation 4

Government to stimulate services innovation

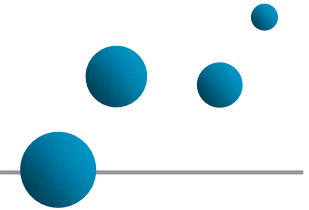
- 'raising the bar' as a customer for, and provider of, services
- establishment of national support infrastructure



***Federal Government services
expenditure 2006-07 = \$235 billion***

- DITR, 2007

Our agenda today



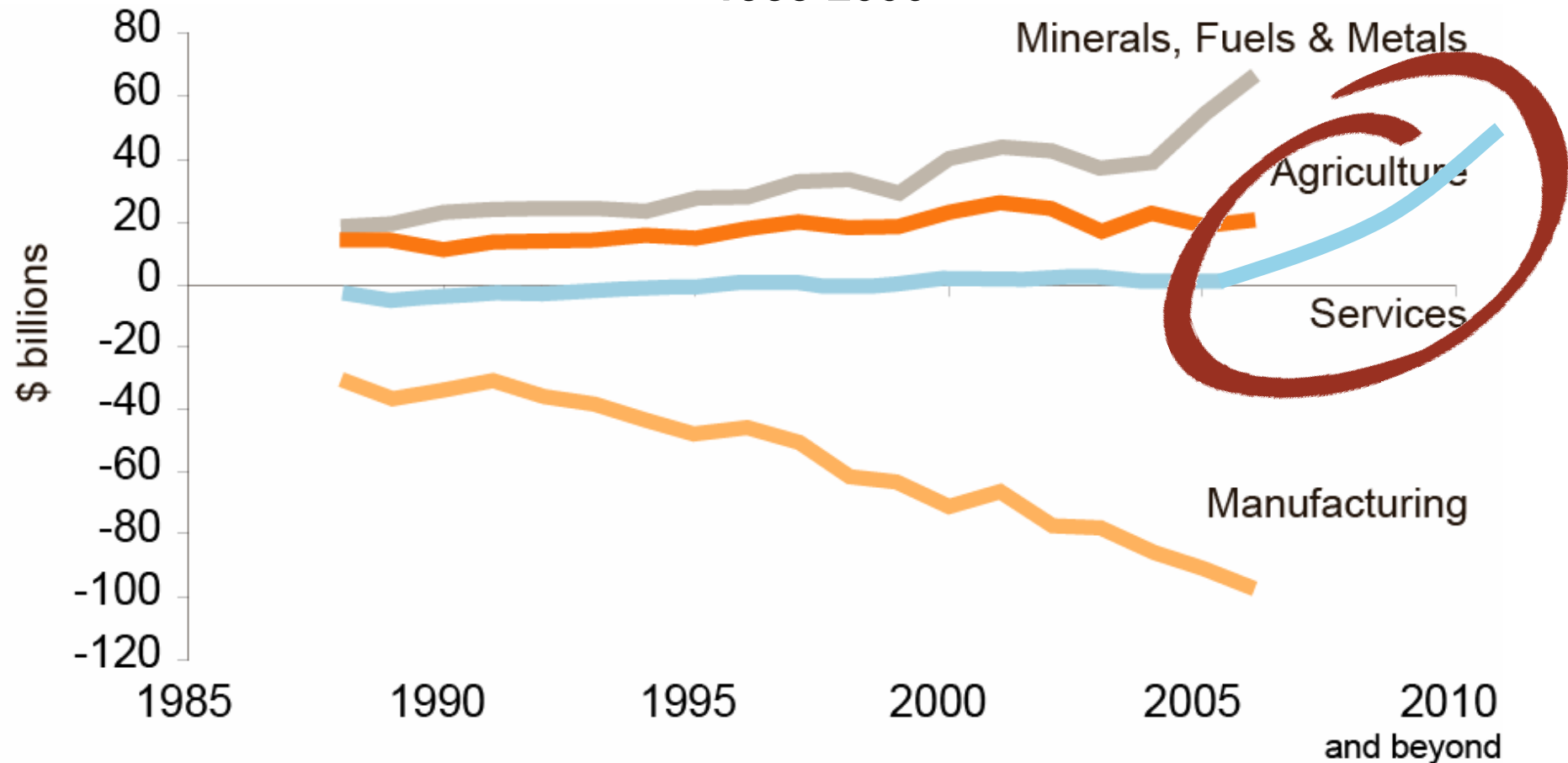
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 **A glimpse of the future**

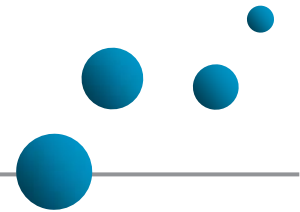
The future?

Australia well positioned in the global economy

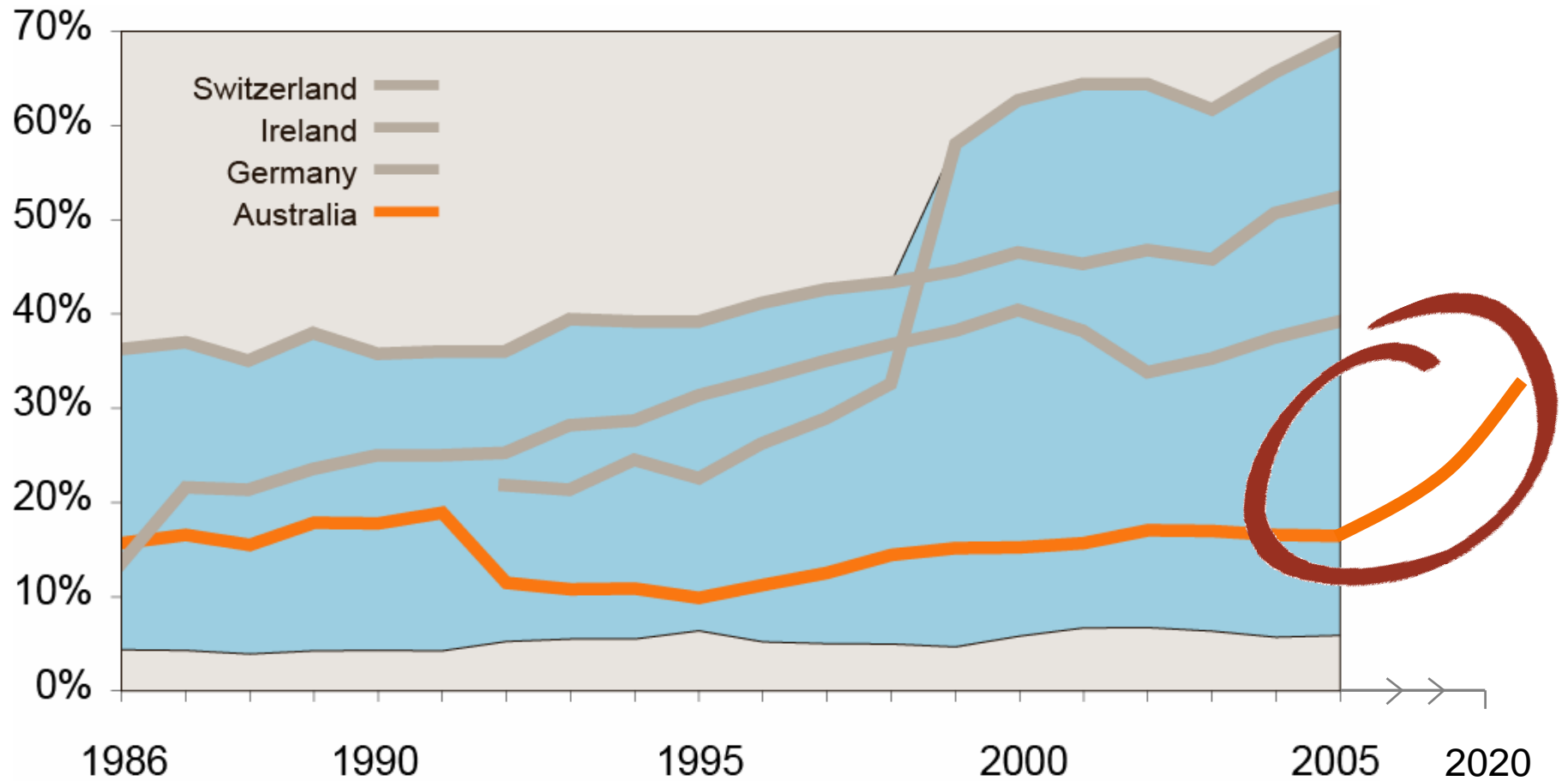
Australian current account balance of payments 1988-2006



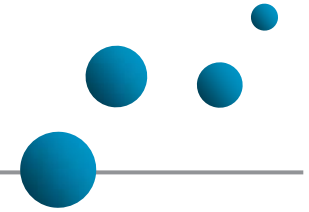
The future?



Knowledge-intensive services (KIS) exports within the OECD as a percentage of total services exports



World class service provisions to Australians and the world



**Enhancing existing industries where we have
traditionally held a competitive advantage...**



MINING SERVICES



EDUCATION

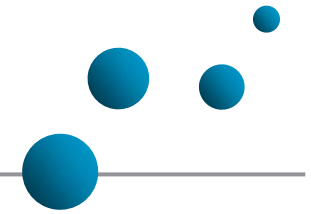


AGRICULTURE



TOURISM

World class service provisions to Australians and the world



Capitalising on niche export opportunities



FINANCIAL



INFORMATION &
COMMUNICATION



ENERGY



HEALTH



ENVIRONMENT



Thank you.
Questions please...