

The Whitehorse Report

ICT Industry Survey and Analysis

January 2007

© Centre for Innovative Industries Economic Research Inc

And Whitehorse Strategic Group Ltd.

www.whitehorsestrategic.com

A.C.N. 006 784 407

3rd Floor, 45 William St.

Melbourne, 3000

e-mail: admin@whitehorsestrategic.com

Phone: 03 9614 8510

Fax: 03 9614 8201



This publication is copyright. Other than for the purposes of and subject to the conditions prescribed under the Copyright Act, no part of it may be in any form or by any means (electronic, mechanical, microcopying, photocopying, recording or otherwise) be reproduced, stored in a retrieval system or transmitted without prior written permission.

© Copyright
Centre for Innovative Industry Economic Research Inc. ABN 64 806 162 996
and Whitehorse Strategic Group Ltd ABN 17 006 784 407
Level 3
45 William Street
Melbourne, Victoria 3000
Telephone: (61-3) 9614 8510
Facsimile: (61-3) 9614 8201
Online
Email: admin@whitehorsestrategic.com.au
Website: www.whitehorsestrategic.com.au

About the Centre for Innovative Industries Economic Research Inc

CIIER is an Asia-Pacific Centre, formed to create a facility, repository, and think-tank for consistent, competently researched, up-to-date, and analysed data on employment, markets, revenue streams, R&D, processes and management methods, specifically focussed on high technology, innovative, and emerging industries.

About Whitehorse Strategic Group Ltd.

Whitehorse Strategic Group Ltd. is an Australian owned management consulting practice founded in 1987 with a well established reputation in helping Industry and Government achieve success through strategies designed to maximise existing investments and capture efficiencies from new technologies. The Whitehorse Research Services Division produces the 'Top 250' *ICT Industry Research Report*, widely recognised as the leading creditable indicator of trends in the Australian ICT industry, and conducts detailed analysis and reporting on Information Technology, and Reports on other high technology industries. Whitehorse principals specialise in the areas of ICT Market Research, eGovernment policy and strategy, Business Process Management, and Economic and Community Development.

STATISTICAL PANEL	4
INTRODUCTION.....	5
RESEARCH BACKGROUND	5
RESEARCH SUPPORT	5
SURVEY AND ANALYSIS PROCESS	6
<i>Structure of our Reports.....</i>	<i>6</i>
CIER "ICT WORKER" MODEL	7
<i>The "ICT Industry"</i>	<i>7</i>
<i>National and State based models</i>	<i>9</i>
<i>Frequency of survey and analysis</i>	<i>10</i>
ICT INDUSTRY EMPLOYMENT	12
EMPLOYMENT MODEL	12
<i>Changes in ICT employment structure</i>	<i>15</i>
ICT INDUSTRY EMPLOYMENT SKILLS DEMAND	16
<i>ANZCO compatibility.....</i>	<i>16</i>
ICT INDUSTRY FEMALE EMPLOYMENT.....	21
ICT INDUSTRY DEMOGRAPHY	21
COMPANY NUMBERS AND SIZING	21
<i>In summary.....</i>	<i>21</i>
ICT INDUSTRY REVENUE	22
ICT INDUSTRY RESEARCH AND DEVELOPMENT	24
R&D BY INDUSTRY SECTOR	24
ICT INDUSTRY DEVELOPMENT.....	25
ALLIANCES, BARRIERS, GRANTS AND SUPPORT	25
MARKETS, EXPORTS	25
THE "T250 DATABASE.....	26

Statistical Panel

Centre for Innovative Industry Economic Research Inc.		
Australian ICT	December 2006	Trend
<i>Total ICT workers in Australia</i>	505,000	<i>Slowing but steady growth</i>
<i>Companies in ICT Industry</i>	26,500	<i>Small increase</i>
<i>SME's in the ICT Industry(Below 20 staff)</i>	25,350 (95% of all companies)	<i>No significant change in % of SME's</i>
<i>Employees in ICT Industry</i>	262,000	<i>Steady continued growth, State and sectoral variations</i>
<i>Employees in large ICT Industry companies (+100 staff)</i>	142,000 (54% of total ICT industry staff)	<i>Slight reduction in %</i>
<i>Revenue of ICT Industry</i>	\$78.8 Billion	<i>Continued growth, sectoral variations</i>
<i>R&D of ICT Industry (T250 only)</i>	\$605 Million	<i>Long term sustained decline, starting to plateau</i>
<i>R&D per capita</i>	\$4,424	<i>Lifting slightly in last six months, from long term decline</i>

Introduction

It is well recognised that the ICT industry in Australia is a key productivity enabler for other industries, but direct ICT employment, both in total and relative to other industries, shows that the ICT industry is also a major employer.

By the broadest definition, ICT employment accounts for nearly 5.5% of total Full Time Equivalent (FTE) employment in Australia, more than many other Australian industry sectors, including Mining; Electricity, Gas and Water supply; Banking and Finance; and TV, Radio, Media.

The ICT industry is also a significant source of export revenue, and accounts for nearly 80% of ICT R&D performed in this country.

This Summary has been prepared to give an overview of the current state of the Australian ICT industry, as of January 2007, based upon the Whitehorse Top 250 survey and methodology (T250), and other statistical sources.

Individual tailored reports by State and Industry sector are also available.

Research background

The conduct of a research task such as this cannot take place effectively without the support and freely given time of many people. The consultants wish to thank all of the individuals and companies who assisted us by providing the data upon which the analysis is primarily based.

Research Support

This research has been greatly assisted by the helpful cooperation of industry bodies, especially the Australian Information Industry Association (AIIA), and Software Queensland, both of which bodies have circulated the Survey questions to their members and encouraged participation.

Survey and Analysis Process

The primary mechanism that is used to provide the data for this Report is a detailed survey of ICT companies in Australia, known as the 'Whitehorse Top 250'. The methodology employed includes a questionnaire both mailed and emailed out to respondents and direct verification telephone contact with a significant proportion of the survey base. The survey is supplemented by web-searches, press reports, Annual Reports, and other public sources of data.

The Whitehorse "Top 250" database contains detailed data for the last six years on now over 790 operating companies with 137,000 staff, \$72 billion in revenue and \$600 million in R&D expenditure. Historical data is also kept on companies which have been acquired, merged, or closed during this period, leading to a database with over 1000 company entries.

The current data, gathered in Nov/Dec 2006, represents approximately 53% of total current industry employment and 92% of total current industry revenues in the ICT industry in Australia.

From this data, a series of industry models are developed in a consistent and statistically verified structure. These models allow for the estimation of National and State industry sectoral totals for a number of measures, and for comparison and trend analysis to be performed.

Structure of our Reports

The Report level of our Reports varies, with data able to be presented in National Summary form, for particular States, or particular industry groupings.

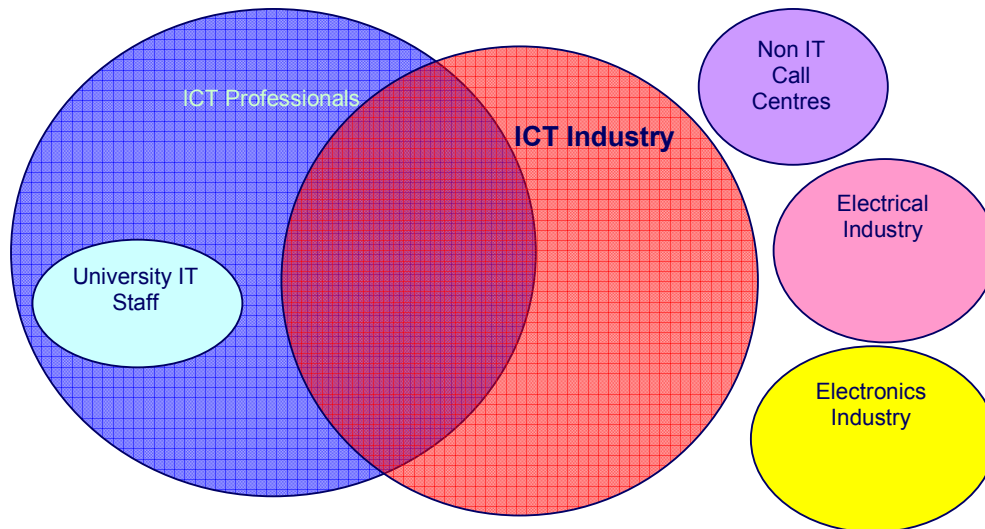
Each of our periodic reports is also different, as the range of data that could be analysed is too much for any one report, and different priorities for concentration may be requested by the recipients, or indicated by the data. Where there is little variation from previous series data, the amount of detailed investigation is diminished as the content of previous reports on the subject matter will tend to apply. Some data may also be analysed at a national or a cross-sectoral level only, as the data density may not justify conclusions made for particular States, or for particular industry sectors or other groupings.

CIER "ICT Worker" Model

One of the significant difficulties in understanding ICT in Australia is the frequent confusion between analysis of the ICT work-force in labour market terms (e.g. what job the individual performs), and analysing the ICT work-force in Industry terms (e.g. what kind of organisation the individual worked for).

ICT broad employment occurs in a number of groupings. These include:

- the providers of ICT goods and services (usually called the ICT industry).
- the purchasers and users of ICT goods and services including the government and private sectors who also employ a large number of specialists to help them apply their ICT purchases.
- the trainers, teachers and researchers into ICT who generally (but not always) operate within the universities and colleges.
- people who provide technical support to ICT, but who might, more properly, be categorised as electrical or electronics specialists
- people working in call-centres, or in desk-top publishing and graphics design



This "bubble" diagram illustrates some of these elements.

There is a significant percentage of ICT professionals in the ICT industry, but ICT industry employment includes not only those professionals but also many ICT non-professional technical, sales, logistical and administrative staff.

The "ICT Industry"

The term "ICT Industry" is also often used in the press, or by other commentators, for a confusing range of different things, ranging from the "tight" definition of companies solely concerned with the provision of ICT products and services, but that includes companies with major units supplying ICT good and services, through a "looser" definition that may include retail ICT, that may include call centres that are mainly parts of other industries (e.g. banking), that may include significant sections of the electronics industries, and of

other professional services (e.g. management consultants and, historically, accountants), to a "broad" definition that can include anyone working on ICT related matters in any industry.

We consider that the "broad" definition is best described by the term "ICT Worker", whereas the term "ICT Industry" is better reserved for the "tight" definition above, as defined by the Australian Bureau of Statistics ¹, but perhaps "loosened" to embrace the other ICT goods and services covered by the more globally accepted OECD (2003 and 2004) definition, in order that international comparisons be made more meaningfully.²

It should be noted that these internationally agreed definitions are not followed by the Australian Bureau of Statistics, which recently stated that:

*"The Working Party on Indicators for the Information Society convened by the OECD has produced a draft 'Classification of ICT Goods' and is working on a classification of ICT services. The ABS had significant input into this work and the classification used by the ABS... **is broadly consistent with, but not identical to the OECD classification as far as it relates to goods. The OECD definition included a broader range of goods than the Australian definition.** The Australian definition only includes ICT goods if they are able to be networked or are components of goods that can be networked. It also excludes a range of medical, scientific and audio visual equipment".³ (emphasis added).*

Obviously, where "goods" are excluded, so are the workers who produce, market, and distribute them, consequently **a more narrow definition of the goods and services involved in ICT necessarily also understates the commensurate employment and revenues involved, and thus the relative "size" and significance of the industry concerned.**

Whilst these overlaps and distinctions have been known for some time, to date there has not been an attempt to reconcile, and, more importantly, to quantify, the various components within a single employment model.

The diagram here illustrates a Model, developed by CIIER and Whitehorse, which allows us finally to reconcile these differences, regardless of the employment and classification paradigm selected, and to calculate the relative proportion of ICT employment that makes up the Australian ICT employment structure, by both Labour market and industry sector measures.

Perhaps as significantly, the Model also demonstrates the significant 65% overlap between ICT industry employment (using the "tight" ABS definition), and ICT professionals and technical staff employed across all industries, thus underscoring the common interests of ICT trade and professional bodies in Australian ICT industry development. (CIIER and Whitehorse include communications and engineering professional and technical staff within this definition of ICT professionals and technical staff)

¹ ABS 8126-0

² A Proposed Classification of ICT goods, OECD, Paris, 2003; Classifying Information and Communication Technology services, OECD, Paris, 2004

³ ABS (2006) *ICT Satellite Account: Australia*, Cat No 5259.0, Canberra, p33.

This new model also allows us to model ICT technical and professional employment, and therefore potential work-force demand, by industry sector. This can help in analysing, and quantifying skills needs, since each industry has some more specific ICT skill-sets among the more generic needs of every industry.

As an example of this, a recent small skills conference was advised of a problem in recruiting a specific developer skill-set. Whilst initially attractive to the six educational bodies present to establish such a course, in later discussion it emerged that the potential national demand for this skill-set was probably under 10 jobs per year. Whilst this might still encourage one educational body to respond, any more would have simply eventuated in unplaceable graduates downstream.

The impact upon "Satellite" accounts of this approach is also significant. The ABS initial, and experimental, ICT satellite account⁴ uses a very "tight" definition, both of ICT employment, in which it only includes 3 job groupings rather than the more usual 10-13, and in its definition of ICT production, where it seems to leave out software products produced by the Australian ICT industry, and draws a number of other definitional conclusions that tend, in our estimation, to understate production..

This leads to the ABS ICT Satellite account conclusion that ICT employment (as defined at around **235,000** persons in 2002-3) was then around **2.5%** of the total Australian employed.

However, using the broader definitions above, "ICT workers" amount to over 500,000 persons in December 2005, or closer to 5.5% of total employed, a 120% larger contribution!

Broadening the definition for this satellite account, in accordance with the international norms above, would therefore also increase the perceived contribution of ICT to the national economy.

An increase from the, to some, already startling 4.6% contribution to GDP indicated by the ABS ICT Satellite Account report to an even more startling conclusion, might sway more conventional economists into truly recognising the economic significance of ICT, and its impact upon the Australian economy.

National and State based models

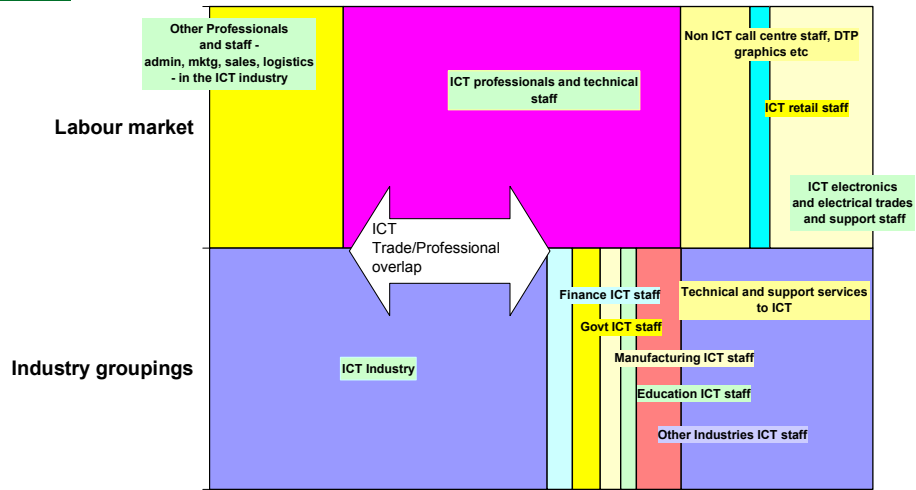
The first quantified Models have now been built, both for the Australian work-force, and for specific States. The paradigms have been constructed for the December 2005/January 2006 period, as some of the necessary data-sets are not yet available for later periods. The Models are, however, constructed in such a way that later data can be systematically added, thus allowing for time-series analysis to be developed.

⁴ ABS 5259.0 2002-3



ICT Workers in Australia, - by Industry and by Labour market ,

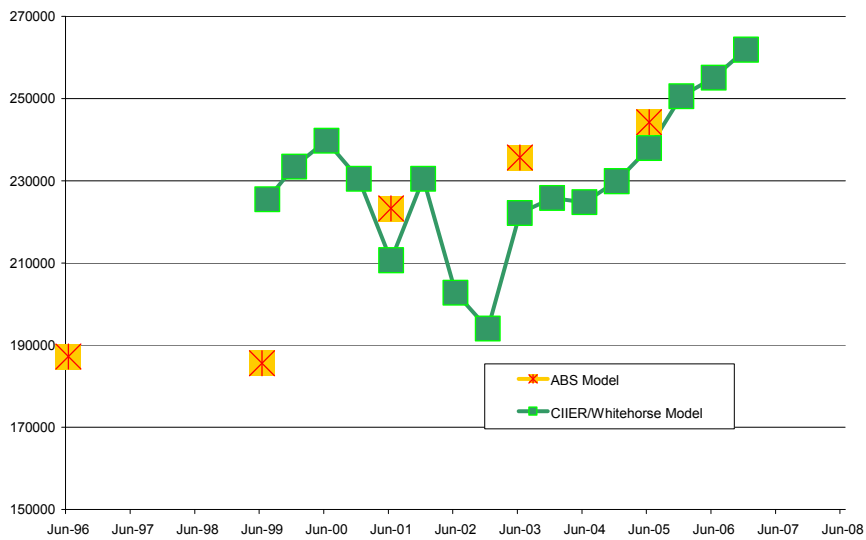
Source ABS Labour force Feb 2006, ABS ICT Satellite account, Mar 2006, CIER/Whitehorse T250 Dec 2005, DEWR Employment by State Dec 2005, Some data unpublished. CIER modelling based on ABS paradigms. Copyright CIER Inc 2006



Frequency of survey and analysis

The chart below shows ABS and CIER/Whitehorse published estimates of ICT industry employment. (In a number of cases ABS original estimates were later amended, the later data has been used in all cases)

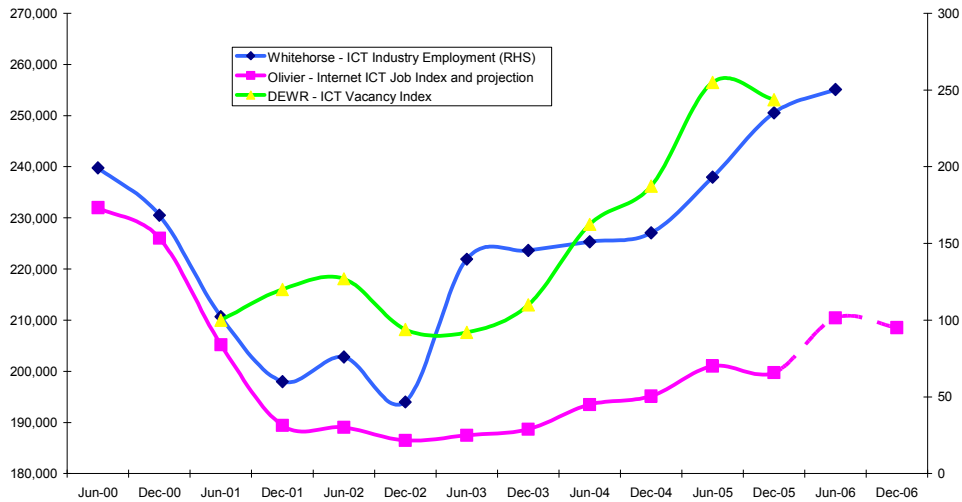
Australian ICT Industry Employment - Model comparisons 1996-2006



An analyst just accessing ABS data, based upon an average three year gap between models, would see steady ICT industry employment growth from 1999 through to 2005, however the CIIER/Whitehorse six-monthly data shows a far more volatile picture, charting outsourcing driven industry growth in 2000-2001, and both the “dot-bomb” employment reductions in 2001-2, and the very swift recovery back to the old employment base in 2003-4.

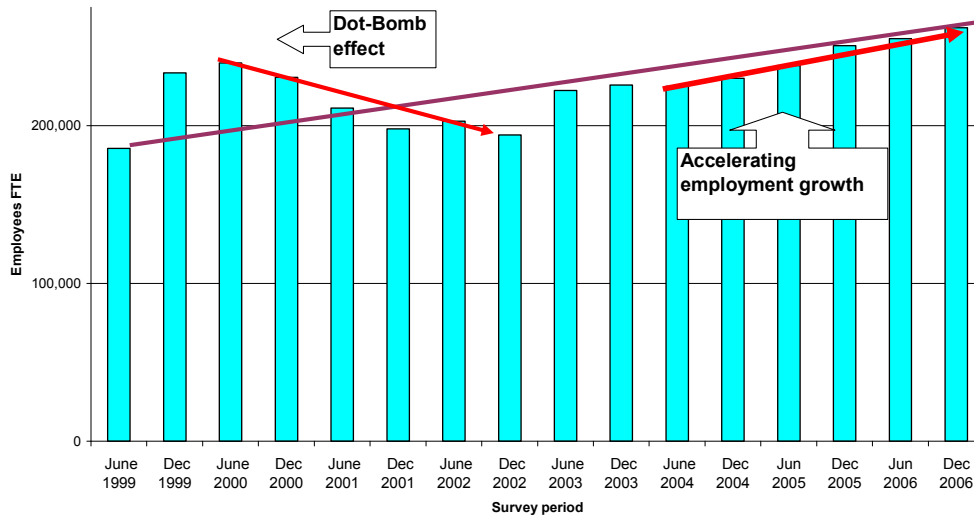
ICT Industry Employment

Employment Model

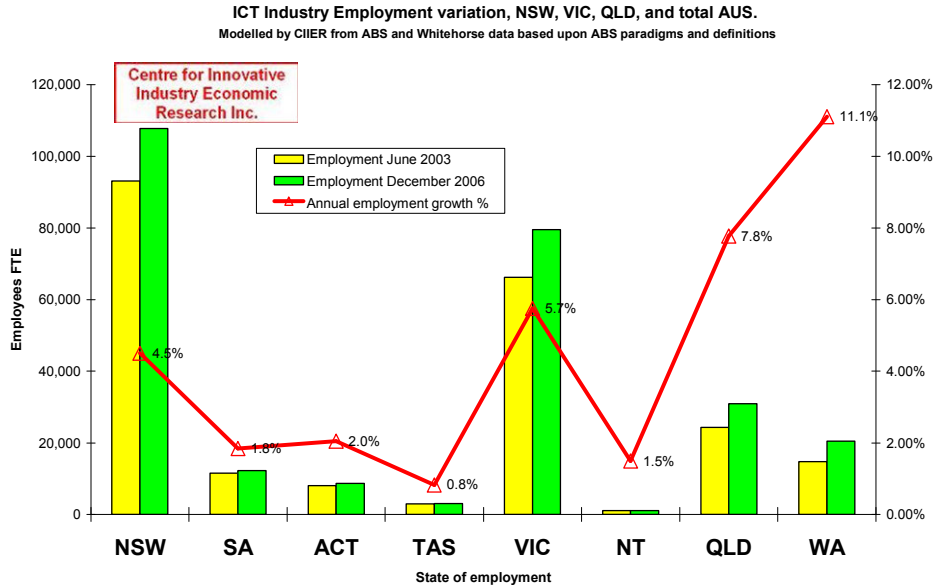


Centre for Innovative Industry Economic Research Inc.

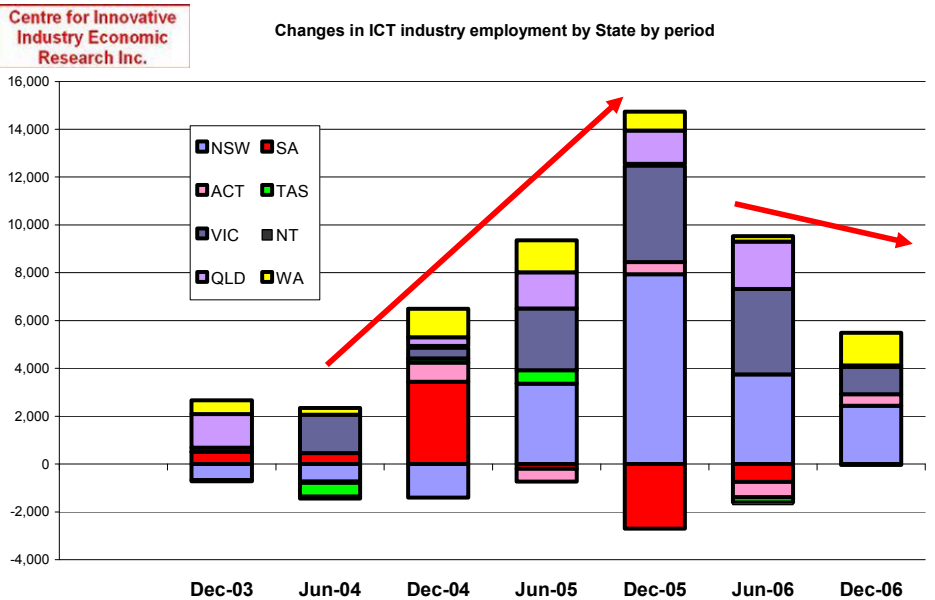
Australian ICT industry employment



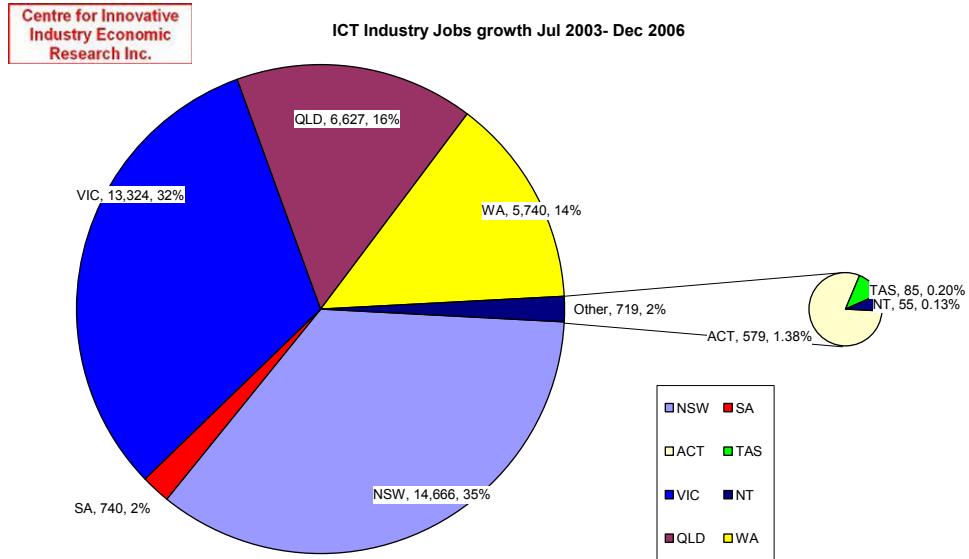
The national ICT industry employment trend continues to rise, lifting in the last two surveys above the previous high of January 2000. The rate of increase is not as high as in the last survey, and this is reflected in the broader base Olivier index, for which our projections are also showing a slight forward decline in job vacancies.



The ICT industry jobs growth contrast between the States is shown dramatically in the graph above. Percentile growth since June 2003 has been highest in WA, Qld, and ACT, above average in Victoria, average in Tasmania, a little below in NT, whilst SA has recorded a fall in ICT industry employment in the last six months. Actual jobs, however, have risen most in Victoria and NSW, outstripping even the "mining" States.



Six monthly employment volatility in the last three years has been most significant in NSW and in SA. However the most important trend is in the reduction of volatility over the last two Surveys, indicating a more stable, but still growing, environment.

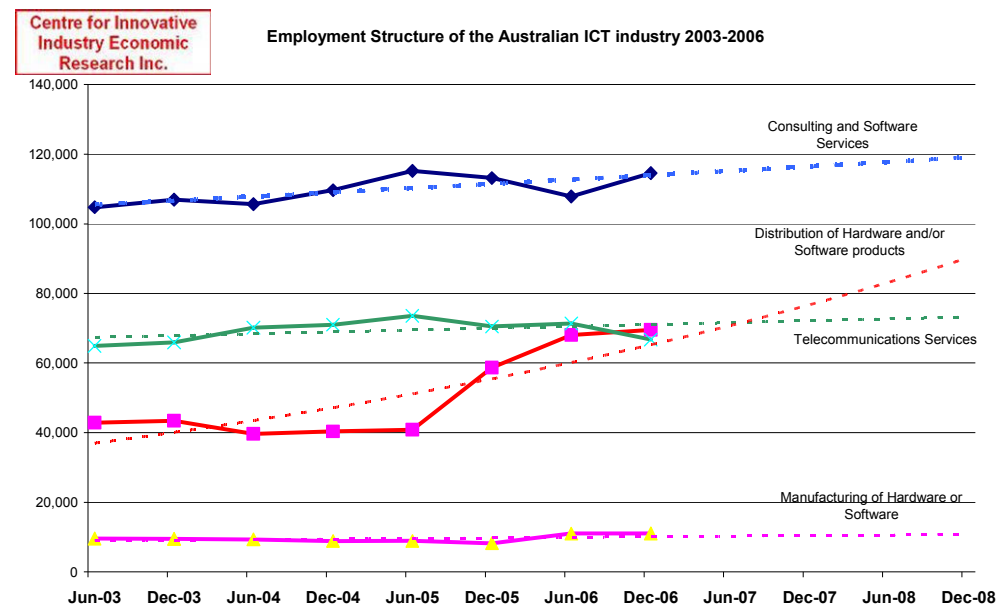


Over the long haul, since June 2000. Victoria has recorded higher growth than NSW, but in the last three years NSW has caught up and passed Victoria in total jobs growth. The cumulative "Rest of Australia" has surged since June 2005 in ICT industry jobs growth.

Changes in ICT employment structure

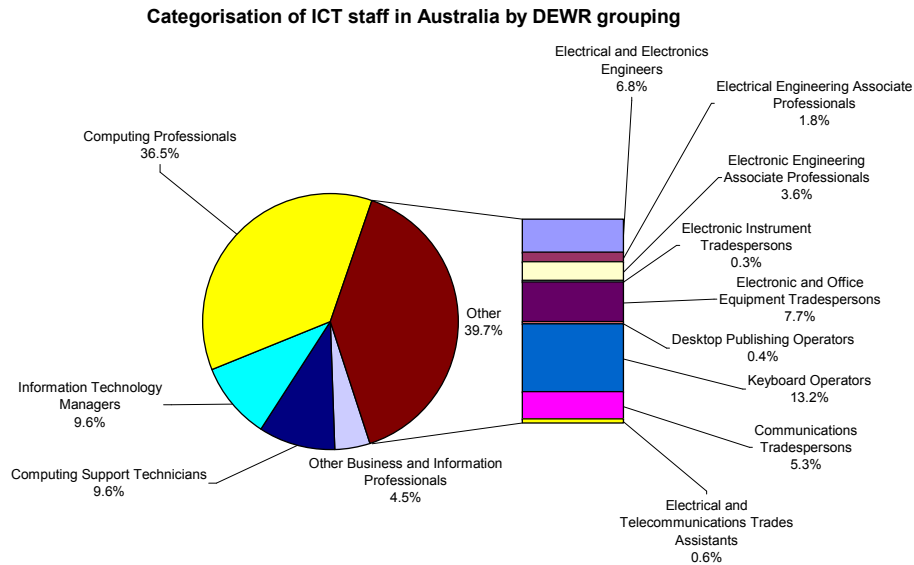
Whilst there have been significant changes in ICT industry employment by location, there have been significant changes in the composition of the structure of the ICT industry as well.

This graph shows both the impact of those changes by industry sector, and the effect if the current trend continues. Of most import is the current downward trend in telecommunications employment, which, whilst it is offset in total terms by growth in other industry sectors, tends to include quite specific skill-sets that are not shared with other sectors.



Such changes not only therefore impact upon gross employment, but also on demand for particular skills in the future.

ICT Industry Employment Skills demand



When evaluating skills demand, it is useful to look first at the relative significance of particular skill-sets. This chart shows the March 2006 DEWR grouping of ICT worker categories (using a "broad" definition, across all industries in Australia showing that nearly half are categorised as either "Computer professionals", or "IT managers".

For the purpose of the analysis below, ICT skills have been categorised into a standardised structure, developed originally for the ICT Skills Snapshot project, but since applied to a number of other ICT labour market studies by CIIER and others.

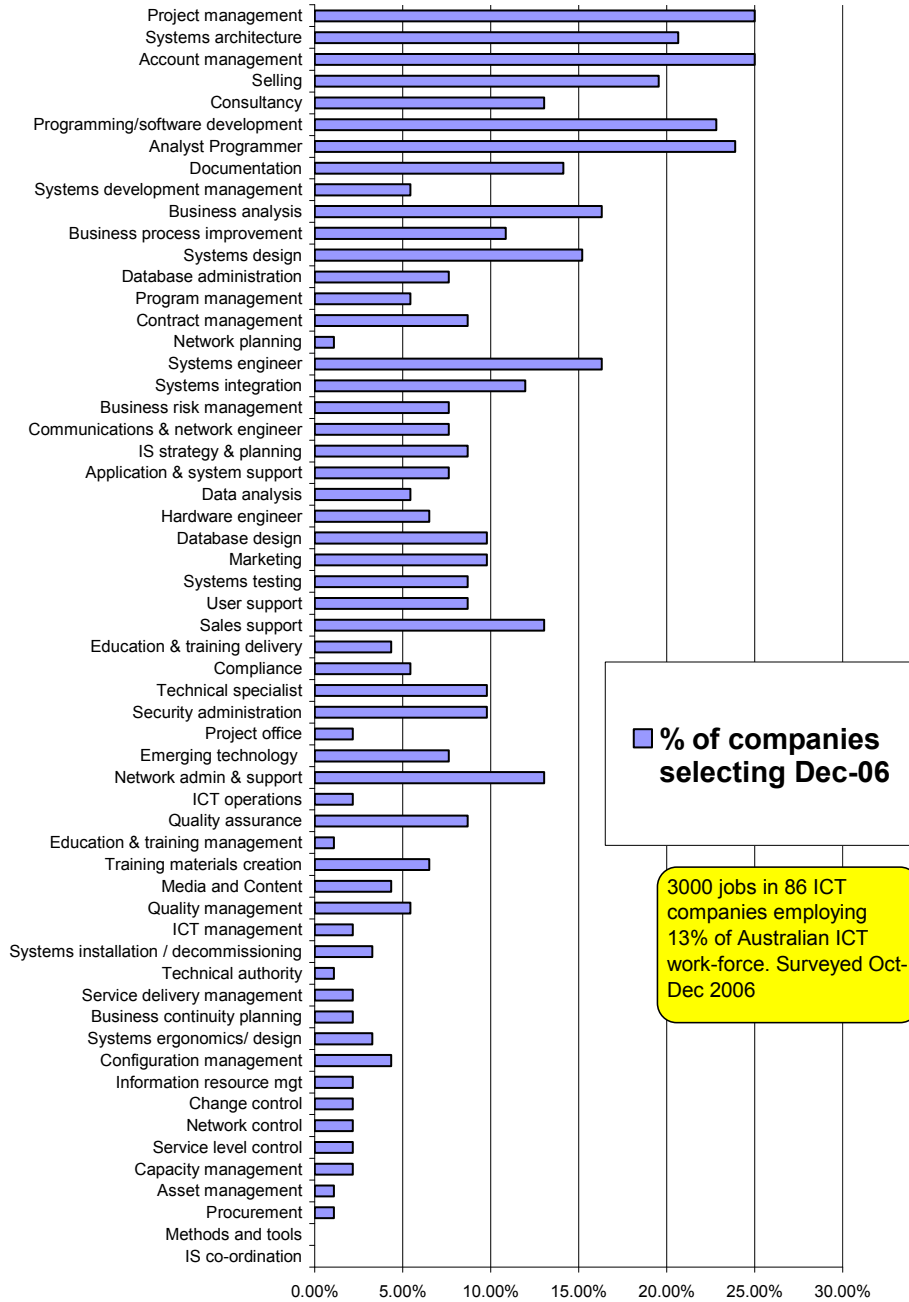
ANZCO compatibility

CIIER has commenced a "mapping" exercise to establish correlation between the model above and the new ANZSCO ICT employment model, and will convert all of our current and historical data and structures to the ANZSCO format, once it has been finalised and promulgated. This will enable historical and trend analysis to continue under the new structure.

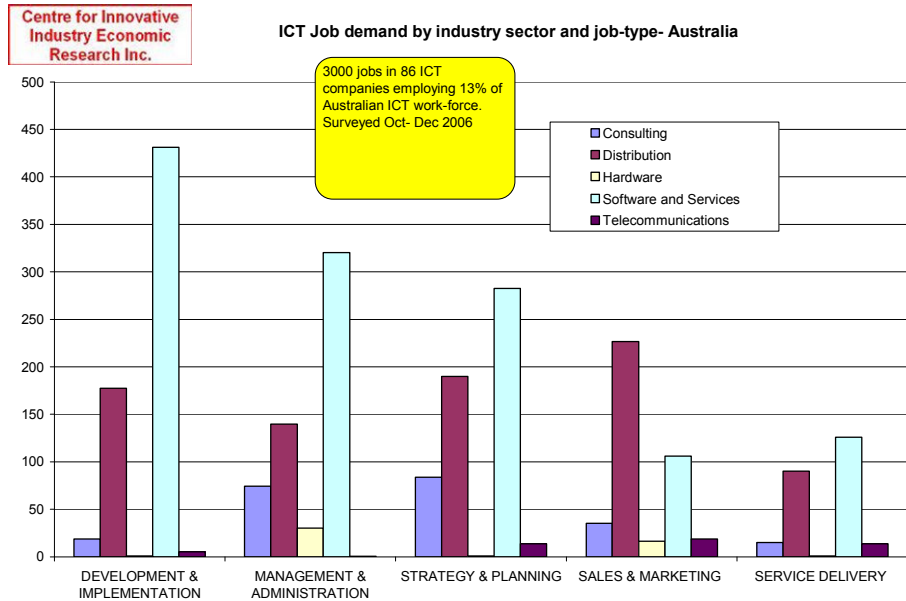
Skill Category	Subcategory	Skill designation
Development & implementation	<i>Human factors</i>	Documentation
	<i>Installation & integration</i>	Systems installation/decommissioning
		Systems integration
	<i>Systems development</i>	Analyst Programmer
		Business analysis
		Data analysis
		Database design
		Media and Content
		Programming/software development
		Systems design
		Systems ergonomics/design
		Systems testing
		Technical authority
	Management & administration	<i>Project management</i>
Project management		
Project office		
<i>Quality management</i>		Compliance
		Quality assurance
		Quality management
<i>Resource management</i>		Asset management
		Education & training management
		ICT management
		IS co-ordination
		Service delivery management
		Systems development management
		Supply management
Contract management		
Procurement		
Sales & marketing	<i>Sales and marketing</i>	Account management
		Marketing
		Sales support
		Selling
Service delivery	<i>Education and training</i>	Education & training delivery
		Training materials creation
	<i>Engineering</i>	Communications & network engineer
		Hardware engineer
		Systems engineer
		Capacity management
	<i>Infrastructure</i>	Configuration management
		Network control
		Security administration
		Application & system support
		Database administration
	<i>Operation</i>	ICT operations
		Service level control
		User support
	<i>User support</i>	Network administration & support
		Other
		User support
Strategy & planning	<i>Business/IS strategy and planning</i>	Business process improvement
		Business risk management
		IS strategy & planning
	<i>Information management Advice</i>	Consultancy
		Information resource management
		Technical specialism
		Business continuity planning
	<i>Technical strategy and planning</i>	Change control
		Emerging technology monitoring
		Methods and tools
		Network planning
Systems architecture		

**Centre for Innovative
Industry Economic
Research Inc.**

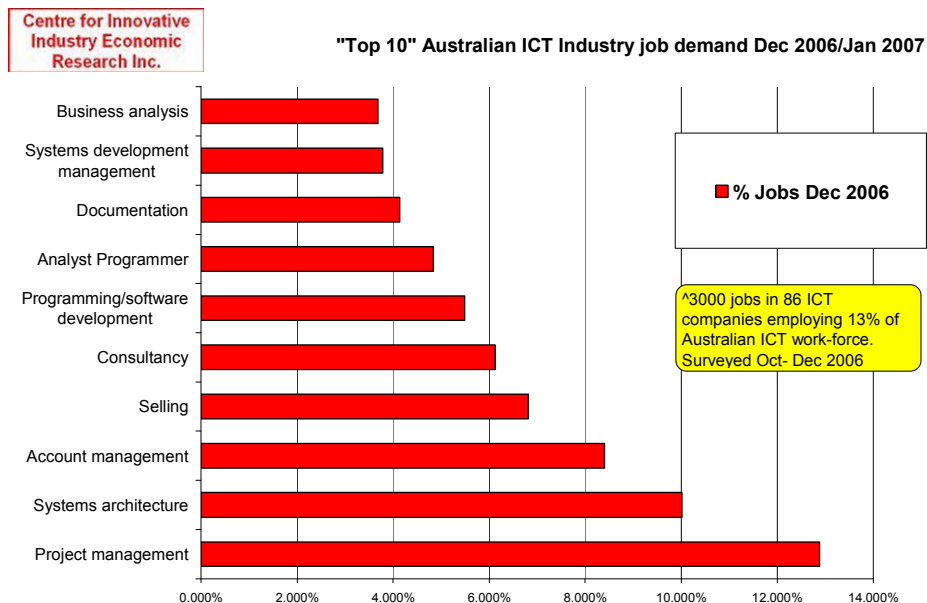
Australian ICT Industry job demand Dec 2006/Jan 2007



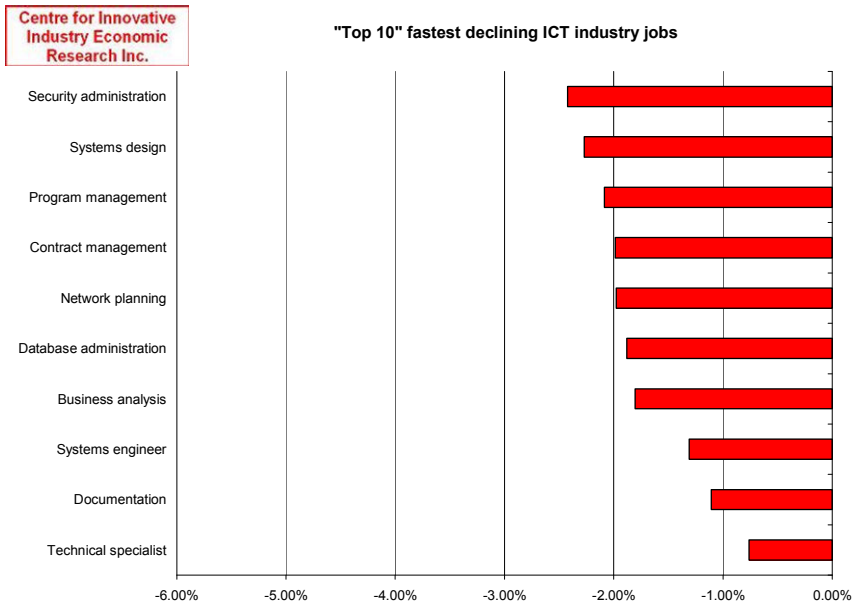
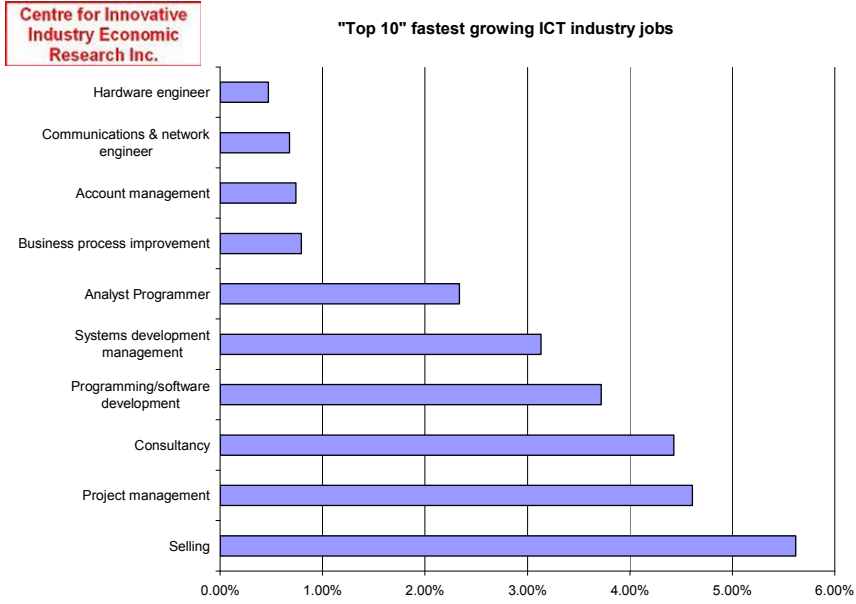
This orientation to management and professional requirements noted in the DEWR pie-chart is reinforced in the "Skills-set sought" analysis shown here, in which ICT industry T250 respondents were asked to indicate what skills etc were in demand for them.



This data was then analysed individually for each company, and based upon the size of each company's work-force and turnover ratios, an estimated "vacancies" calculation was made.. It is interesting that "development and implementation" jobs and "strategy and planning" jobs well outpace "service delivery".



The chart above shows the current "Top 10" job-skills in demand. We note that some of these groups have, however, lessened in demand since earlier Surveys, whilst others, outside this list are growing more quickly.



It is also important to note that those growing, are growing much faster than those declining !

ICT Industry Female Employment

This analysis was dealt with extensively in June 2006. For further information contact us at <mailto:admin@whitehorsestrategic.com>

ICT Industry Demography

Company Numbers and Sizing

This analysis was dealt with extensively in June 2006. For further information contact us at <mailto:admin@whitehorsestrategic.com>

In summary:

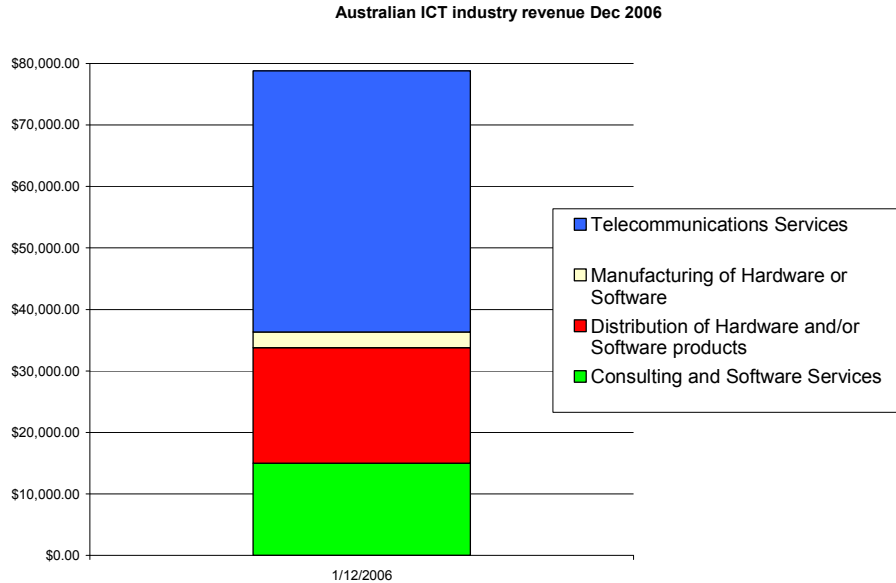
Over 96% of software and computer services firms are small to micro sized.

Distribution companies, on the other hand, only have just over around 50% "micro" sized.

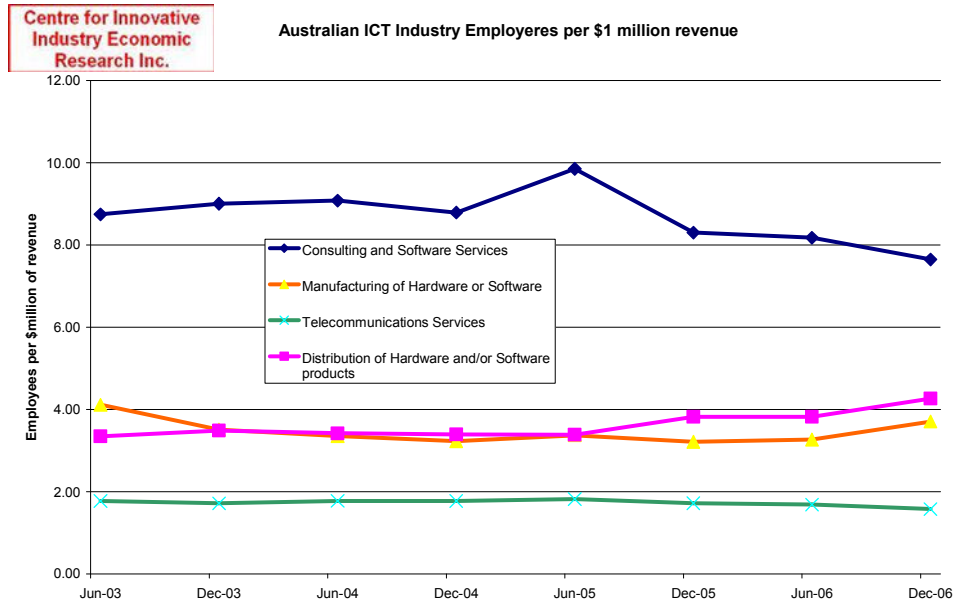
Telecommunications companies also include a large number of small players, illustrating the more fragmented nature of this industry sector compared to earlier years.

The ICT industry is, truly, a small business industry in Australia, with a very limited number of companies having the critical mass for international growth.. Policies and programmes for ICT industry development need to recognise this reality, and be focused to an industry paradigm that is capable of response.

ICT Industry revenue

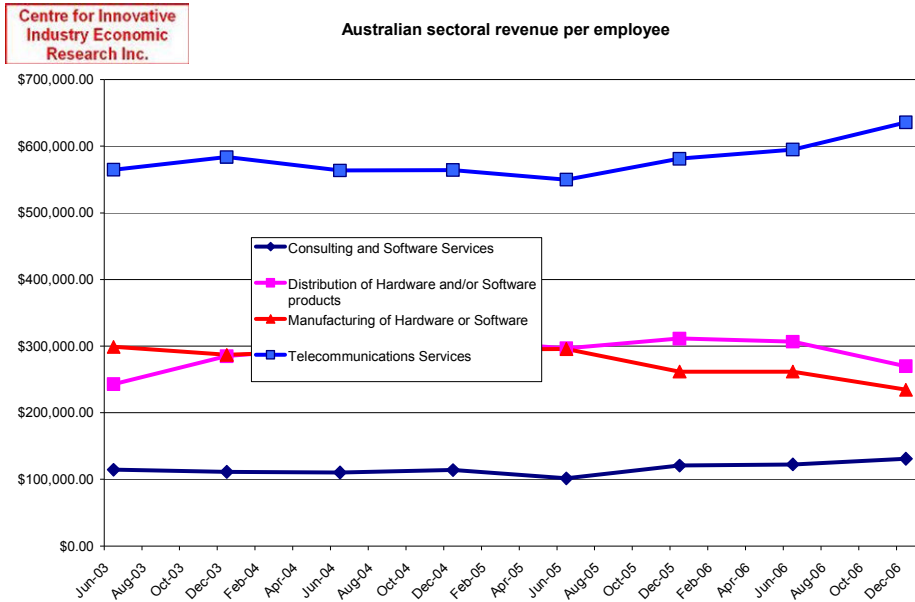


Australian ICT industry revenue grew again in the last six months to nearly \$Billion 80.

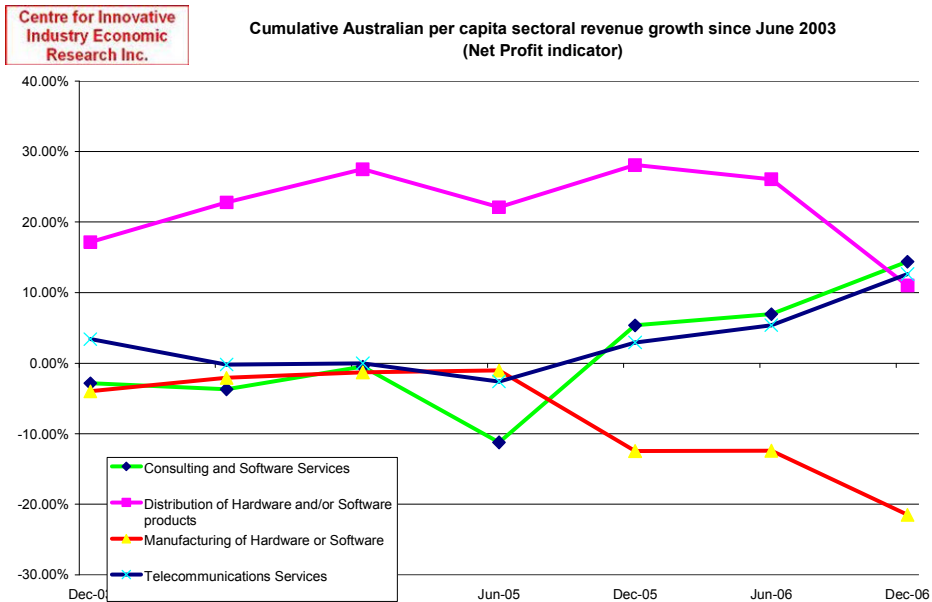


However, the growth in ICT industry revenue was accompanied by a fall in the number of staff employed per \$million earned, most noticeably in the telecommunications and in consulting and software services. This was offset in part by a slight rise in the manufacturing and distribution sectors

This can indicate either higher profitability, based upon higher productivity levels, or continued employment restructure.

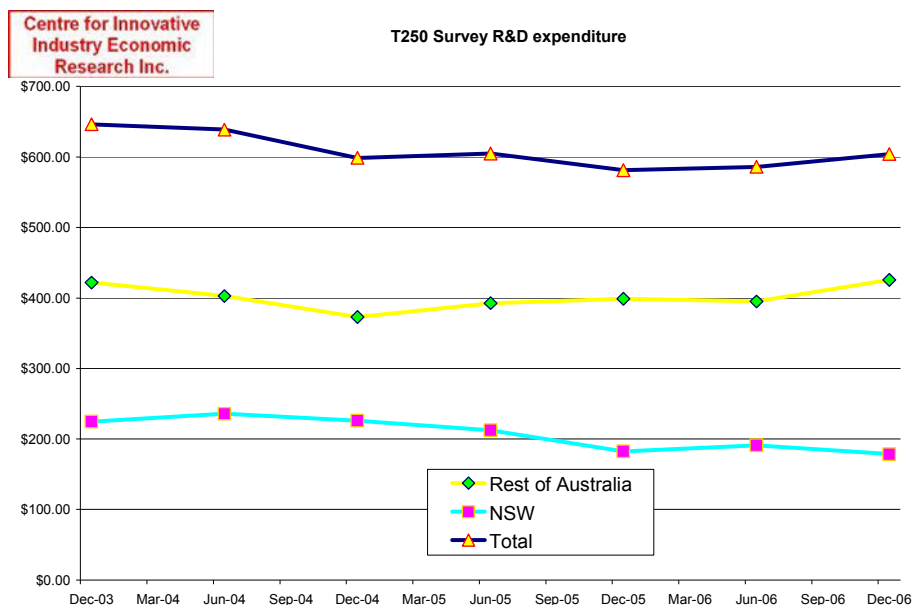


Looked at the other way round, as revenue per employee, telecommunications companies continue to improve profitability at the expense of employment.



The cumulative percentile impact of these changes since June 2003 shows that the greatest changes have occurred in distribution companies (importers and wholesalers), whilst manufacturing has continued to decline.

ICT Industry research and development



After an extended period of decline to 2004, followed by a very flat national ICT industry trend to June 2006, Total R&D has started to lift again. Despite the strong presence of NICTA in NSW, after a short counter-trend lift in that State last survey, R&D spend there has now reverted to its previous decline..

R&D by industry sector

R&D in consulting and software and services has declined in the last period, consistent with the decline since December 2003.

R&D has lifted in the distribution sector, but is far lower than historically in telecommunications, however R&D in the telecommunications sector has again lifted slightly in the last six months.

R&D per capita has improved marginally to a national average of \$4,400.

Industry Sector	National annual R&D per capita – June 2006	National annual R&D per capita – Dec 2006
Consulting	\$2,094.68	\$1,872.17
Distribution	\$4,056.94	\$4,533.86
Hardware	\$11,213.57	\$11,209.88
Software	\$5,370.16	\$5,080.83
Telecommunications	\$3,204.46	\$3,425.69
Total	\$4,281.77	\$4,415.73

ICT Industry Development

Alliances, Barriers, Grants and support

Markets, Exports

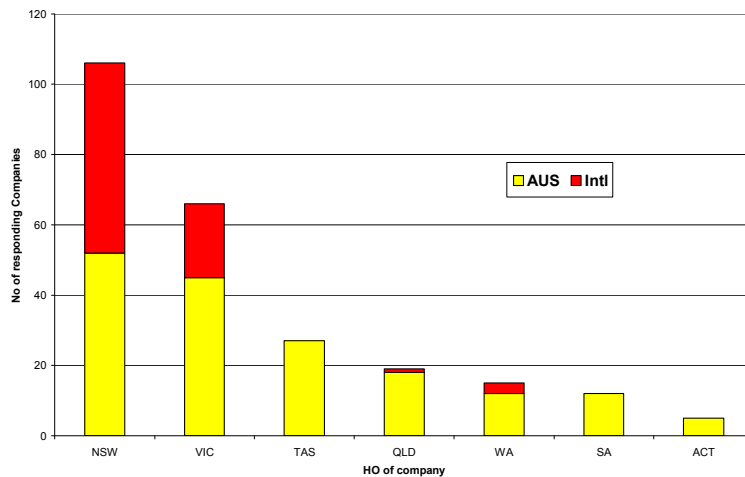
These analyses were dealt with extensively in December 2005. For further information contact us at <mailto:admin@whitehorsestrategic.com>.

The "T250 database

- Over 1000 total company records
- Data back to 1998 – updated 6 monthly
- Detailed Employment data for over 130,000 staff - 52% of the Australian ICT Industry
- All States and Territories represented
- All industry sectors represented
- Employment and Revenue models based upon ABS paradigms and stringently tested



T250 database local/international mix

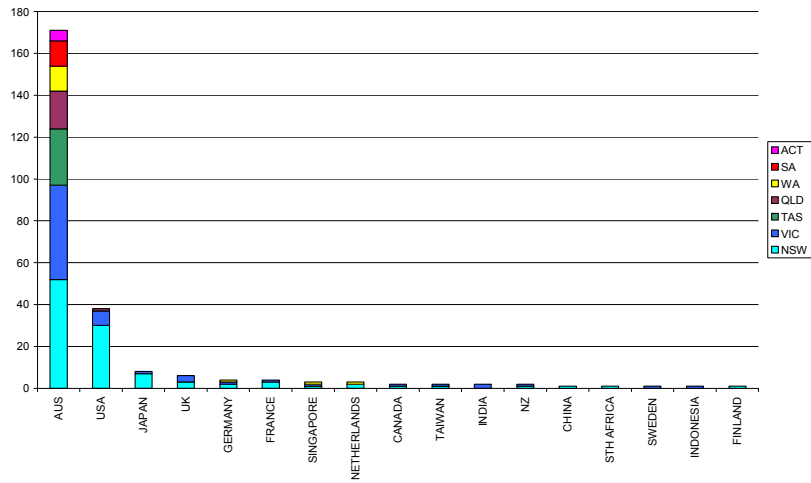


Centre for Innovative Industry
Economic Research

The "mix" of local and international company data in the database, by necessity, overstates international presence, as a significant number of larger companies are internationally owned. This is statistically compensated within the model.



T 250 database - Head offices



Centre for Innovative Industry
Economic Research

The database includes companies headquartered in all States and Territories, to ensure a lack of regional bias, however most international companies tend to be headquartered in NSW, Victoria and Queensland.

This same evenness of representation is maintained for the State samples.