2002-2004 Fourth Round of Investigative Studies

Determining the Impact of ICT on Decent Work in the Asia Pacific Region

Determining the Impact of ICT on Decent Work: Australia

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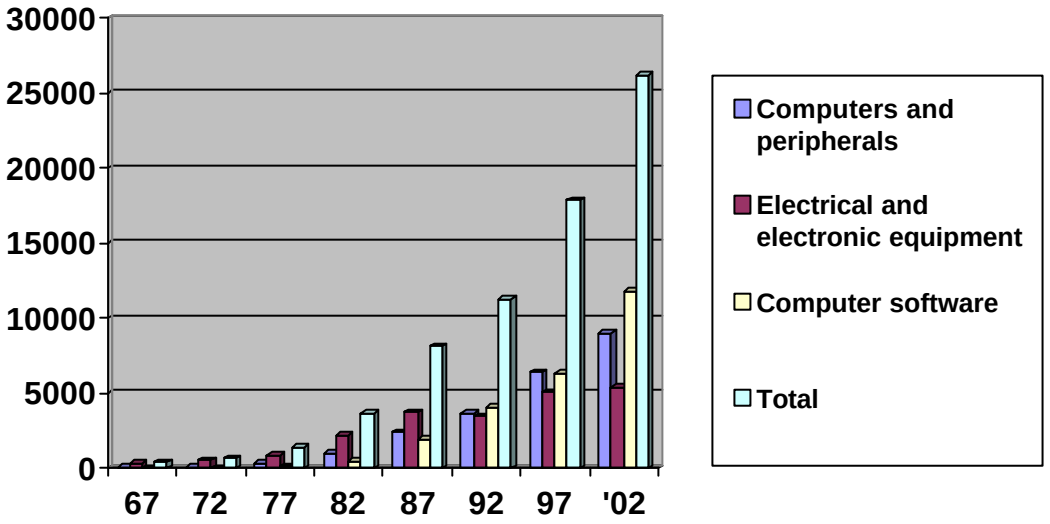
1. Proliferation of ICT in Australia

1.1: Use of ICT in Australia

ICT was introduced into the Australian economy in the early 1960s. While the precise date of the introduction of ICT is difficult to determine Australia's system of National Accounts (Australian Bureau of Statistics [ABS] 5204.0) first started recording disaggregated fixed capital expenditure on ICT in 1966-67. However data on fixed capital expenditure on computer software is first recorded for 1962-63. In that financial year capital expenditure on computer software was estimated to be just $10m (current prices).

Figure 1: Information Technology Fixed Capital Formation, Selected Years, 1967-2002 (Current Prices $AUD millions)



Source: Australian System of National Accounts, Various Years, ABS 5204.0

As can be seen from Figure 1 expenditure on IT began to accelerate quickly from the late 1970s. Total expenditure on IT capital more than doubled in each of the five year periods 1972-1977, 1977-1982, 1982-1987. Despite slower relative growth throughout the 1990s in the period 1997-2002, including the period of the slump in the IT sector in Australia and the rest of the western world, ICT expenditure was still increasing at an average of approximately 10% per annum, well ahead of CPI.

1.1.1: Use of ICT across various industries

Table 1: ICT Gross Fixed Capital Formation by Industry, 2001-02 ($AUD millions)

Agriculture, forestry and fishing	
Computers and peripherals	116.2
Electrical and electronic equipment	177.8
Computer software	100.4
Total	394.4
Mining	
Computers and peripherals	103.0
Electrical and electronic equipment	86.3
Computer software	116.6
Total	305.9
Manufacturing	
Computers and peripherals	1095.4
Electrical and electronic equipment	235.5
Computer software	1028.2
Total	2359.1
Electricity, gas and water supply	
Computers and peripherals	614.4
Electrical and electronic equipment	1005.0
Computer software	158.1
Total	1777.5
Construction	
Computers and peripherals	269.1
Electrical and electronic equipment	105.3
Computer software	366.3
Total	740.7
Wholesale trade	
Computers and peripherals	497.1
Electrical and electronic equipment	129.7
Computer software	863.7
Total	1490.5
Retail trade	
Computers and peripherals	670.6
Electrical and electronic equipment	217.9
Computer software	623.3
Total	1511.8
Accommodation, cafes and restaurants	
Computers and peripherals	180.1
Electrical and electronic equipment	126.4
Computer software	221.5
Total	528.0
Transport and storage	
Computers and peripherals	471.0
Electrical and electronic equipment	288.7
Computer software	550.7
Total	1310.4
Communication services	
Computers and peripherals	737.0
Electrical and electronic equipment	1781.5
Computer software	564.5
Total	3083.0

Finance and insurance	
Computers and peripherals	1123.8
Electrical and electronic equipment	93.5
Computer software	2691.0
Total	3908.3
Property and business services	
Computers and peripherals	1397.5
Electrical and electronic equipment	244.0
Computer software	1831.2
Total	3472.7
Government administration and defence	
Computers and peripherals	501.3
Electrical and electronic equipment	70.1
Computer software	858.8
Total	1430.2
Education	
Computers and peripherals	452.9
Electrical and electronic equipment	309.9
Computer software	470.5
Total	1233.3
Health and community services	
Computers and peripherals	343.1
Electrical and electronic equipment	128.1
Computer software	964.6
Total	1435.8
Cultural and recreational services	
Computers and peripherals	275.2
Electrical and electronic equipment	316.4
Computer software	168.9
Total	760.5
Personal and other services	
Computers and peripherals	144.1
Electrical and electronic equipment	103.8
Computer software	219.7
Total	467.6
All industries	
Computers and peripherals	8990.4
Electrical and electronic equipment	5419.7
Computer software	11800.0
Grand Total	26210.1

Table 1 provides detailed data for the year 2001-02 on fixed capital expenditure on IT disaggregated by each of the 17 standard industry categories used under the ANZIC classification system. As can be seen from this table there are four sectors that are relatively big spenders on IT:

- Finance and Insurance : $3.9B
- Property and Business Services: $3.5B
- Communication Services: $3.1B
- Manufacturing: $2.4B

Whilst detailed analysis is beyond the scope of this report, it is apparent that ICT has been pivotal to the restructuring of work and organisational processes in heavy IT-using sectors. In finance and banking, for instance, ICT has led to

the routinisation and de-skilling of some jobs and facilitated extensive outsourcing and offshoring.

The Property and Business services category includes the heart of the IT specialist industry in Australia – computer consultancy services. The Finance and Insurance sector is evidently highly dependent on ICT with extensive use of IT for both data processing and, increasingly, customer service. Communication services is dominated by telecommunication services, which is of course inherently IT intensive. The relatively large spend in manufacturing is indicative of the relative size of the sector in Australia and the widespread use of IT for production and manufacturing systems, as well as logistics, supply chain management and sales and distribution.

In the last financial year for which figures are available (2001-02) over $26B was spent on ICT capital alone – equivalent to almost 3.8% of GDP.

Measures of gross fixed capital formation on IT include only a part of what might be considered IT expenditure. It includes all expenditure on new fixed capital assets plus net expenditure on second-hand fixed assets broken down into computers and peripherals (ie: hardware), electrical and electronic equipment, and computer software. This excludes wages and salaries for ICT workers and expenditure on ICT services including:

- Telecommunication services
- Payments for leased ICT equipment
- Depreciation of ICT equipment
- Repair and maintenance expenses
- Non-capitalised purchases of ICT goods and services
- Payments for ICT consultancy services

Data that includes this form of expenditure is not available for all years. The most recent data which includes this broader definition of ICT expenditure and which enables disaggregation into industry sectors is for the financial year 1997-98.

Table 2: ICT Expenditure in the Private Sector, by Industry, 1997-98

	Wages of in-house ICT employees	Other ICT expenses	Total ICT expenses	Total per person employed	Total per PC user	Wages of in-house ICT employees as % of Total expenses
	$m	$m	$m	$	$	%
Mining	61	306	367	4 536	9 864	17
Manufacturing	585	2 289	2 873	2 886	8 128	20
Utilities	86	419	505	11 050	13 644	17
Construction	*69	*1 058	1 127	2 601	7 798	*6
Wholesale trade	559	2 107	2 666	5 624	10 710	21
Retail trade	160	1 263	1 423	1 192	4 359	11
Hospitality	*79	376	454	1 013	5 899	17
Transport and storage	193	1 011	1 204	3 388	9 670	16
Communications	259	2 581	2 840	22 023	31 181	9
Finance and insurance	957	3 752	4 709	14 568	18 216	20
Property and business services	678	3 298	3 977	4 059	7 653	17
Health and community services	93	461	554	1 099	2 963	17
Cultural and recreational services	97	439	536	2 858	8 793	18
Personal and other services	*67	277	344	1 937	4 926	*19
Total	**3 942**	**19 638**	**23 580**	**3 726**	**9 297**	**17**

Source: ABS Business Use of Technology, 8129.0

It should be noted that the expenditure in Table 2 does not include government administration and defence, education (both relatively large ICT spending sectors) nor agriculture, forestry and fishing.

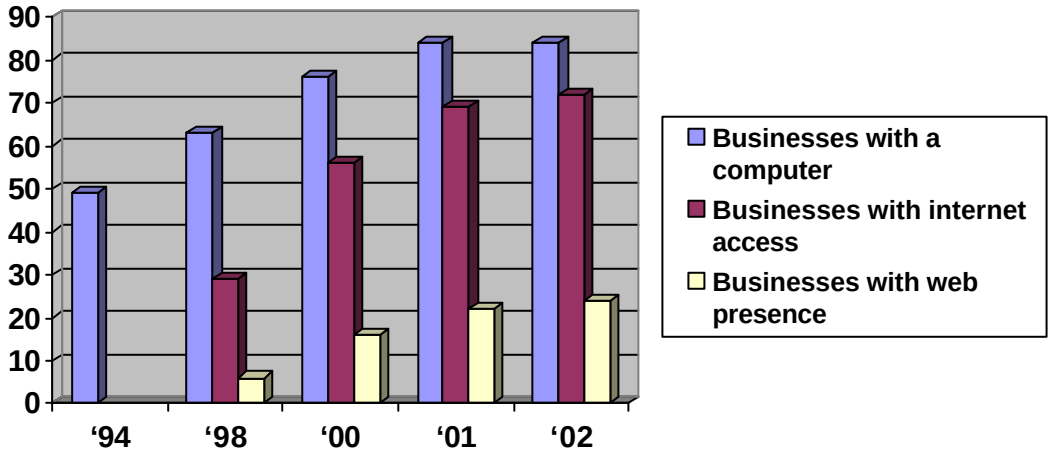
In terms of industry concentration of ICT expenditure a relatively similar picture emerges to that provided by that analysis of fixed capital formation. The sectors spending most on ICT are:

- Finance and insurance: $4.7B or $14,500 per employee
- Property and business services: $4.0B or $4,100 per employee
- Communication services: $2.8B or $22,000 per employee
- Manufacturing: $2.9B or $2,900 per employee

It can be concluded from this analysis that ICT usage has proliferated very widely across Australian industry since the introduction of ICT in the early 1960s. It is not the case that ICT usage is concentrated in a few sectors.

The deep and broad spread of the use of ICT is confirmed by recent data looking at the extent of business usage of computers, internet access and web presence.

Figure 2: Business Use of Selected Technologies, 1994-2002 (Percentage of private, non-agricultural sector businesses)



Source: ABS, Business Use of Information Technology 2001-02, 8129.0

As can be seen from Figure 2 by 2002 almost 85% of all Australian private sector businesses used computers and the vast majority had internet access. Those businesses not using ICT are invariably micro businesses. Thus, by 2002 100% of Australian businesses with at least 100 employees used computers and 99% of those had internet access and 81% had a presence on the web. At the other end of the spectrum 21% of micro businesses (with fewer than five employees) did not use computers. This largely reflects the high concentration

of small blue-collar contractors (especially in building and construction where the number of contractors has surged) amongst micro-businesses.

1.2: Production of ICT in Australia

Core ICT producing industries in Australia can be divided into four sectors (Houghton 2001: 1):

1) ICT equipment manufacturing and wholesale,
2) software, multimedia and games
3) Information/ Telecommunication services
4) Computer services

Sector 1) can be considered to the 'hardware sector' and 2) - 4) the 'software sector'

1.2.1: Production in the software sector

The software sector includes three sub-sectors:

"Computer services" includes business that provide:

- customised software services and solutions
- software maintenance,
- web site design and/or internet consultancy
- computer systems analysis
- hardware consultancy
- maintenance and repair
- disaster recovery
- data processing services
- computer time sharing
- information storage and retrieval services

"Software and Content" includes businesses that engaged in recorded media manufacturing and publishing.

"Telecommunication services" includes business that provide:

- basic telephony, mobile and paging services
- data and text services
- internet service provision
- inter-carrier services
- leased lines
- sales of capacity to other providers
- satellite and other services

Table 3: Employment in ICT Software Producing Sectors, 1993-2001

	1993	1996	1999	2001	% growth
Computer services	30 068	55 046	74 395	97 565	224%
Data processing	2 049	5 291	7 174	3 718	81%
Data storage	636	994	908	1 174	85%
Computer maintenance	4 778	5 032	2 519	4 451	-7%
Computer consultancy	22 605	43 711	63 794	88 222	290%
Software and content	557	1 904	3 045	4 383[1]	687%
Telecommunications	70 273	91 701	74 467	77 275	10%
Total	100 898	148 651	151 907	179 223	78%

Source: Houghton 2001 and ABS Information Technology, 2000-01, 8126.0
[1] Estimate by Houghton (2001); other figures for 2001 from ABS

As shown in Table 3 the software producing sector in Australia has enjoyed spectacular employment growth since 1993. Employment in the sector has increased by almost 80% in the eight years to 2001. It is likely that over 200,000 people are now employed in the sector.

However the growth in employment has been far from uniform across the sector. The largest single proportionate growth has been in the production of software and content, however this is still a very small sector in Australia accounting for fewer than 5000 jobs. The telecommunications sector remains one of the biggest sectors in Australia, however employment growth has been slow, expanding only 10% over the period. The sector has been in decline for some time and the major employers in Australia undertook waves of retrenchments throughout the late 1990s.

Strongest growth has occurred within the computer services sector, and, in particular in computer consultancy. Data processing saw a net employment increase over the period, however this disguises the fact that it remains a relatively small employer and that there were major job losses between 1999 and 2001. Similarly, data storage and retrieval has grown but off a very low base and the sub-sector continues to be only a marginal employer. Employment in computer maintenance has fluctuated according to these estimates. Some of this may be due to the difficulty in clearly separating computer maintenance employees from computer consultancy employees as consultancy service contracts will often include or involve maintenance activities.

Massive growth has occurred in computer consultancy services. In the eight years of the reference period employment in this sub-sector increased almost four-fold. Computer consultancy is now the dominant activity in the Australian ICT industry.

One significant influence on employment levels in the Australia ICT sector is the growth of off-shoring. In particular, there appears to have been major off-shoring of data processing work. Many large clients, such as banks in Australia, outsource their data processing work to cheaper cost centres particularly in Asia. However, a recent study of off-shoring commissioned by the Australian Computer Society (Whitehorse Strategic Group 2004) suggests that the extent

of off shoring has been exaggerated by media analysts and that more critical analysis of the impact of off-shoring on non-cost performance (quality, customer service etc.) is likely to see a slowdown in offshoring.

1.2.2: Production in the hardware sector

The hardware sector includes two sub-sectors:

"manufacturing" includes businesses involved in manufacturing:

- computer and communications hardware
- parts, components and consumables
- business machines
- telecommunication, broadcasting and transceiving equipment
- electronic equipment
- electrical and telecommunications cable and wire
- recorded media

"Wholesale trade" includes businesses involved in wholesaling any of the above products.

Table 4: Employment in ICT Hardware Producing Sectors, 1993-2001

	1993	1996	1999	2001	% growth
Manufacturing	20 943	22 629	21 316	25 725	23%
Computers	1 988	6 025	2 915	1 998	1%
Telco equipment	8 285	7 429	6 583	6 093	-26%
Electronic equipment	5 681	3 746	7 743	14 197	150%
Electric cable and wire	4 989	5 430	4 084	3 437	-31%
Wholesale trade	39 670	60 396	63 160	65 102	64%
Computers	15 922	26 599	27 212	27 632	74%
Electronic equipment	23 748	33 979	35 948	37 350	57%
Total	60 613	83 025	84 476	90827	50%

Source: Derived from Houghton (2001).

This sector has also enjoyed strong employment growth in the period since 1993, however it remains a much smaller sector than the software and services sector. The total employment estimated by Houghton (2001) to be over 90,000 by 2001 is also inflated by the inclusion of IT wholesale trade. If the focus is placed more squarely on the IT manufacturing industry sub-sector it can be seen that this remains a very small sector and the vast bulk of this employment is in fact engaged in the manufacture of electronic equipment, telecommunications equipment and cable and wire, rather than the manufacture of computers and peripherals. Houghton estimated that just under 2000 people were employed in the manufacture of computers in Australia. Data for 2001 released subsequently by the ABS estimated the figure to be 3400. In any event it is safe to conclude that computer manufacturing constitutes only a tiny part of the ICT sector in Australia.

2. Measuring Decent Work using Statistical Indicators

2.1: Decent Work Indicators for Australia

Reasonable indicators exist in Australia for most of the dimensions of decent work. However it is neither possible nor meaningful in the Australian context to attempt to estimate these indicators prior to the introduction of ICT and since the introduction of ICT. Generally this is because ICT has been widespread in Australia since the late 1960s and very prominent across virtually all sectors of the economy and the labour market since the late 1970s. Although indicators for many dimensions exist for the 1960s and early 1970s it is implausible to suggest that the changes to the labour market and working conditions since the 1960s or 1970s are attributable to the introduction of ICT.

In light of these issues an alternative approach is taken. Rather than comparing indicators for the present day with indicators for the 1960s or 1970s, current indicators for all employees are compared with indicators for ICT employees, or for employees in the key ICT sectors. This enables us to make some judgement about the apparent impact of ICT on decent work.

Unfortunately, because ICT employment is so widely diffused across a number of industry sectors and occupational groups it is generally not possible to isolate indicators for a perfectly defined ICT employment sector. In general we are forced to analyse data relating to sectors which tend to employ a large number of ICT workers, or, sectors in which a relatively high concentration of ICT employees can be found.

AS noted above the largest area of ICT employment in Australia is in the area of 'computer services'. In terms of Australia's standard ANZIC (Australia and New Zealand Industry Classification) classification system 'computer services' is located in the category 'Property and Business Services' at the one digit classificatory level and the sub-category 'Business Services' at the two digit level. Most ICT employees in computer services are classified as 'Computer Professionals' and are located in the ASCO (Australian Standard Classification of Occupations) one digit category 'Professionals' and in the two digit category 'Business and Information Professionals'. Therefore, in most cases the categories used in the following analysis are 'Property and Business Services' (or where available, 'Business Services') (i.e.: industry classifications) and 'Business and Information Professionals' (i.e.: an occupational classification).

More detailed classifications which better align with ICT employment are used where available.

2.2 Employment opportunities

2.2.1 Employment Opportunities – All Industries

Estimates of employment opportunities can be derived from a number of sources including:

- Total labour force growth – indicating the growth in the number of jobs across the whole economy and including both employed and self-employed positions.

- Labour force participation rate – indicating the percentage of the population aged 15 years and over p[participating in the labour force.

- Unemployment rate – indicating the percentage of the labour force unable to find employment.

- Vacancy Rates – indicating the number of jobs available for immediate filling and for which recruitment action has been taken.

Table 5: Selected Labour Market Indicators, Australia, 1992-2002.

	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Total Labour Force ('000)	8 514	8 569	8 690	8 881	9 061	9 169	9 256	9 395	9 574	9 755	9889
Growth rate (%)		0.6	1.4	2.2	2.0	1.2	0.9	1.5	1.9	1.9	1.4
Participation rate (%)	62.9	62.6	62.7	63.3	63.6	63.4	63.1	63.1	63.4	63.7	63.7
Unemployment rate (%)	10.0	10.7	10.2	8.7	8.1	8.3	8.0	7.4	6.6	6.4	6.6
Vacancies ('000)							97.2	105.1	114.5	89.3	99.2
Vacancy growth rate (%)							14.0	8.1	8.9	-22.0	11.1

Sources: ABS, Australian Social Trends, 2003, 4102.0; ABS, Australian Labour Market Statistics, 6105.0

Table 5 indicates that the Australian labour market has been growing at a moderate pace over the last ten years. The total labour force in Australia has grown over 16% in the eleven years 1992-2002.

Labour market participation rates have increased gradually if slightly over the period – from just below 63% at the start of the 1990s to almost 64% by 2002. Participation rates for men have been declining while participation rates for women have been increasing at a stronger rate. The participation rate for men fell from 74.3% in 1992 to 72.4% in 2002; the participation rate for women increased from 51.9% in 1992 to 55.3% by 2002.

The number of job vacancies tends to fluctuate relatively dramatically from year to year. Nevertheless, at any given point in time, in recent years there tends to be approximately 100,000 jobs vacant in the economy. The job vacancy rate – the number of vacancies as a percentage of the number of employees plus the number of vacancies – tends to run at between 1.2% and 1.4%.

2.2.2 Employment Opportunities in ICT

In general terms most evidence suggests that employment opportunities in the ICT sector have been greater throughout the 1990s and into the 2000's than in the labour market as a whole.

Tables 3 and 4 indicate that there has been strong growth in ICT employment in both the software and hardware sectors, although the strongest and most significant growth has been in the computer consultancy services industry. In 2001 Houghton (2001) estimated that:

> *ICT employment in Australia has increased at a compound annual rate of 6.6% since 1996, compared to an economy-wide job growth of 2.1%*

As noted above employment has been growing most significantly in computer services. The most detailed time series data on this sector was collected by the ABS in 1998-99.

Table 6: Employment in Computer Services Industry, 1992/93 – 1998/99

	1992-93	1995-96	1998-99	% growth	Annual growth
Employment	30 056	55 046	74 395	35.2	10.6

Source: ABS Computing Services Industry, 1998-99, 8669.0

As shown in Table 6 it was estimated that throughout the 1990s employment opportunities in computer services were growing at an annual average rate of over 10%. This can be contrasted with the labour force growth rates for all industries noted in Table 5.

Data on job vacancy rates for the ICT sector are not readily available, however some indication of the number of job vacancies are given by survey data relating to the broader industry group in which many IT jobs are located in Australia – Property and Business Services. Property and Business services account for 11.8% of all employed persons in Australia, yet in 2003 the sector accounted for 17.1% of all job vacancies. (ABS 6105.0 and ABS 6354.0).

Despite the relatively robust growth in employment opportunities in ICT since the early 1990s the recent downturn in the IT sector in Australia since 2001 has indicated that the industry is particularly vulnerable to sharp declines in employment demand. The Department of Workplace Relations ICT Skilled Vacancies Index fell from approximately 700 points in September 2000 to less than 100 by February 2003.

2.3: Unacceptable Work

In general terms relatively little paid employment in Australia could be defined as constituting 'unacceptable work'; ie: work that is unreasonably dangerous, anti-social, very poorly paid or occasioned by extremely long hours or significant deprivation.

An analysis of the reports of state labour departments, which typically have industrial inspectorates charged with the responsibility of monitoring working conditions and bringing actions against employers for breaches of industrial laws and regulations, revealed that the vast majority of breaches were for failure to pay wages or allowances required under industrial legislation or awards or agreements. Very few of these cases tended to involve ICT work.

Some available data can be used to test the contention that there is relatively little work across the labour market or in ICT in particular that could be characterised as 'unacceptable'. The Household, Income and Labour Dynamics in Australia (HILDA) survey was first conducted in 2001. Amongst other things, that survey asks respondents to estimate their satisfaction with their current hours of work. Although this data cannot be disaggregated to the level or category of 'ICT worker', we here use the category 'Business and Information Professionals', which is the occupational category which contains the sub-group with largest concentration of ICT workers in Australia - Computing Professionals.

Table 7 shows data on workers' levels of satisfaction with the content of their jobs.

Table 7: Satisfaction with the Work Itself

	Satisfaction (0 – 10)
Business and Information Professionals	7.58
All other employees	7.63

Source: HILDA 2002 unpublished data.
Note: Satisfaction is scored such that 0 = Totally dissatisfied, 10 = Totally satisfied.

Australian employees generally and Business and Information Professionals register relatively high levels of satisfaction with the work itself.

Survey data is also available on one particular issue of working conditions that is normally thought to be an issue both generally and in ICT professional work in particular – stress at work.

Table 8: Workers' Perception of the Impact of Stress at Work (Percentage of employees agreeing or disagreeing with the proposition that "Job stress will make me ill")

	Disagree that 'job stress will make me ill'	Neutral	Agree that 'job stress will make me ill'
Business and Information Professionals	66.2%	15.8%	18.0%
All employees	73.3%	11.1%	15.6%

Source: HILDA 2002 unpublished data.

A small but significant proportion of workers appear to believe that the level of stress they experience at work will be likely to make them ill. This perception is somewhat more common amongst Business and Information Professionals, with more than one in six of these workers believing that job stress will contribute adversely to their physical or mental wellbeing. Qualitative evidence from case-study research has also found rising levels of work intensification due to a major industry downturn, increased competition, pressures on budgets and the emergence of leaner employment profiles (Buchanan et. al. 2003).

2.4: Adequate earnings and productive work

While accurate comparable data on earnings comparing ICT occupations with other occupations is difficult to access, most surveys confirm that, in general terms, the ICT sector continues to be relatively highly paying.

Table 9: Estimates of Annual Earnings for Selected Industries and Selected IT Occupations, Australia, 2003.

All industries total full-time annual earnings	$AUD
Mining	80 912
Finance and insurance	59 332
Communication services	54 694
Education	52 796
Property and business services	52 442
Government administration and defence	50 658
Manufacturing	49 738
Retail trade	36 624
All industries	50 014
Median total packages for selected IT jobs	
IT management	111 488
IT consulting	109 000
Database administrator	92 923
Systems management	90 470
Programmer/ analyst	74 597
Computer support	64 406

Sources: ABS, Average Weekly Earnings, May 2003, 6302.0 for all industries estimates. Australian Computer Society Remuneration Survey Report 2003 for IT industry estimates.

Note: These figures are not strictly comparable. IT estimates are for "total packages" including value of fringe benefits such as motor vehicles. All industries estimates are for all occupations in the sector and do not include fringe benefits.

Table 9 demonstrates that the average packages being paid to selected IT occupations are much higher than average total fulltime annual earnings for all industries in Australia. As noted in the notes to the table this comparison must be treated with some caution as the IT data includes the value of fringe benefits, whereas the estimates for all industries do not. Perhaps, more significantly, the IT estimates are for particular occupations, most of which are either managerial or professional whereas the all industry estimates average all occupations in the sector.

By looking at the total spent on wages and salaries in the ICT sector (broadly defined) Houghton (2003) estimates that the average wage paid in the sector in 2000-01 was $58 951. This can be compared to the all industries average full-time total earnings of $43 919 for May 2001. This suggests that average IT wage rates are approximately 30-35% higher than average wage rates for all industries. It should be noted that an industry downturn has led to a significant fall in pay rates but the ICT employees still enjoy well above-average wages.

2.5: Decent Hours

"Decent hours" of work implies that:

- Hours are adequate for the worker, in terms of generating sufficient income
- Hours are not be too excessive, in the sense that workers would not prefer to work fewer hours
- Hours are generally worked at socially appropriate times

Table 10: Average Actual Hours Worked per Week, for Full-Time Workers by Industry, Australia, 2003.

Industry	Av. Hours Worked by Full-Timers
Agriculture, forestry and fishing	47.3
Mining	46.7
Manufacturing	41.1
Electricity, gas and water	39.3
Construction	42.7
Wholesale trade	42.8
Retail trade	43.6
Accommodation, cafes and restaurants	45.6
Transport and storage	43.8
Communication services	39.6
Finance and insurance	40.0
Property and business services	**42.6**
Government administration and defence	36.1
Education	42.2
Health and community services	38.9
Cultural and recreational services	42.2
Personal and other services	40.3
All industries	**42.0**

Source: ABS Australian Labour Market Statistics, 2003, 6105.0

Full-time workers in Australia currently work, on average, 42.0 hours per week. While hours worked for ICT workers is not available from this data source, the industry group in which most ICT workers in Australia are located – Property and Business Services – registers a slightly higher number of average hours worked, 42.6 hours per week.

Anecdotal evidence drawn from the case studies of ICT workers and organisations suggests that the major issue with working hours in ICT work in Australia concerns excessive hours (amongst full-timers) rather than inadequate hours (amongst part-timers). In order to test this proposition data from the HILDA survey was analysed.

Table 11: Satisfaction with Hours of Work, Full-Time and Part-Time employees in Business Services and All Industries, 2002.

	Satisfaction (0 – 10)
Full-time employees in Business Services	6.79
Full-time employees all industries	6.95
Part-time employees in Business Services	7.76
Part-time employees all industries	7.44

Source: HILDA 2002 unpublished data.
Note: Satisfaction is scored such that 0 = Totally dissatisfied, 10 = Totally satisfied.

As can be seen from Table 11 part-time employees are generally more satisfied with their hours of work than full-time employees. This provides some support for the claim that long hours of work amongst full-timers might be greater problem than inadequate hours amongst part-timers.

Full-timers in business services are slightly less satisfied with their hours of work than full-timers generally. This suggests that long hours of work and the failure for overtime to be compensated in this sector may be generating higher levels of dissatisfaction over hours of work.

Part-timers in Business Services, on the other hand, are more satisfied with their hours of work than part-timers generally. This suggests that access to adequate hours of work and/ or access to work at appropriate times is not as big a source of dissatisfaction in Business Services as in other industries.

2.6: Stability and Security of Work

Stability of work in Australia can be measured by the extent of casualisation (ie: the percentage of jobs in an industry or occupational group that are defined as casual which implies no guarantee that the position will be ongoing or 'permanent').

Casualisation rates

Australia has amongst the highest casualisation rates in the western world and has, for many years, been second only to Spain in the OECD in terms of the percentage of employees engaged on a casual (temporary) basis. Table 12 provides data on proportion of employees employed on a casual basis by industry.

Table 12: Casual Employment in Industry Divisions, Australia, 2000

Industry	% casual
Agriculture, forestry and fishing	56.7
Mining	9.2
Manufacturing	15.0
Electricity, gas and water	*5.8
Construction	31.1
Wholesale trade	17.8
Retail trade	45.2
Accommodation, cafes and restaurants	57.4
Transport and storage	23.9
Communication services	15.0
Finance and insurance	11.7
Property and business services	**31.8**
Government administration and defence	7.7
Education	17.1
Health and community services	21.8
Cultural and recreational services	44.1
Personal and other services	22.6
All industries	**27.3**

Source: Watson et al. (2003) using data from ABS, Employee Earnings Benefits and Trade Union Membership, 2000, 6310.0

As can be seen from these data the industry group containing a large number of ICT workers, Property and Business Services is relatively highly casualised – almost a third of all employees compared with 27% of employees across the population of employees in all industries.

However, in this case, anecdotal evidence and evidence gleaned from the case studies suggests that the vast majority of ICT workers are employed on a full-time, permanent or at least ongoing basis.

More disaggregated data is readily available on this point.

Table 13: Casual and Permanent Employment in Selected ICT Sectors, 2000-01

	Number	% of employees
ICT Manufacturing		
Permanent	11 767	93.3
Casual/ temporary	850	6.7
ICT Wholesale trade		
Permanent	47 673	93.8
Casual	3 142	6.2
Computer services		
Permanent	90 661	93.4
Casual	6 401	6.6

Source: ABS, Information Technology, 2000-01, 8126.0

Perceived job security

Security of work might be best measured in terms of the perceptions of workers. Table 14 shows data drawn from the HILDA survey asking respondents to estimate the extent of their satisfaction with the security of their current job. It would be expected that part-time workers will have lower levels of job security because the vast majority of part-time workers in Australia are casual workers (employed under te mporary conditions of employment).

Table 14: Satisfaction with Job Security, Business and Information Professionals and All Employees, by Part-Time and Full-Time status, 2001

	Satisfaction (0 – 10)
Business and Information Professionals	7.29
All employees	7.66
Full-time Business and Information Professionals	7.37
Full-time employees all occupations	7.69
Part-time Business and Information Professionals	6.78
Part-time employees all occupations	7.56

Source: HILDA 2002 unpublished data.
Note: Satisfaction is scored such that 0 = Totally dissatisfied, 10 = Totally satisfied.

As can be seen from Table 14, Business and Information Professionals, the occupational category which includes computing professionals, register lower levels of satisfaction with their perceived job security than all occupations amongst both full-time and part-time populations. Again, though, it should be noted that a recent industry downturn would appear to be impacting negatively on perceptions of job security amongst ICT emplo yees (Buchanan et. al. 2003).

2.7: Fair Treatment

Few measures of 'fair treatment' at work are readily available. The HILDA data does however provide a measure of overall job satisfaction. It could be argued that workers who felt they did not receive fair treatment at work would be likely to register low levels of overall job satisfaction.

Table 15: Overall Job Satisfaction

	Satisfaction (0 – 10)
Business and Information Professionals	7.46
All other employees	7.62

Source: HILDA 2002 unpublished data.
Note: Satisfaction is scored such that 0 = Totally dissatisfied, 10 = Totally satisfied.

As can be seen from Table 15 job satisfaction levels are relatively high for both all employees and Business and Information Professionals. Despite slightly lower levels of overall job satisfaction being recorded for Business and Information Professionals these data suggest that unfair treatment is not a major issue across industry or in ICT in particular.

2.8: Safe Work

Table 16: Incidence Rate of New Workers Compensation Cases per 1000 Employees Reported by Industry, 2000-01

Industry	Cases Reported
Mining	35
Construction	33.3
Transport & Storage	31.9
Manufacturing	29
Agriculture, Forestry and Fishing	28.3
Personal and Other Services	19.7
Health and Community Services	18.5
Wholesale Trade	17.3
Accommodation, Café & Restaurants	15.3
Electricity, Gas & Water Supply	14.8
Cultural and Recreational Services	14.4
Retail Trade	12.8
Communication Services	11.6
Government Administration & Defence	11.3
Property & Business Services	**10.2**
Education	9.9
Finance	4.4
All Industries	**17.8**

Source: National Occupational Health and Safety Commission, Compendium of Workers Compensation Statistics, 2000-01, p. 19.

Official figures on the incidence of workers compensation claims illustrate serious occupational health and safety incidents are relatively uncommon in property and business services. Just 10.2 cases were reported per 1000

employees during 2000-01. Only education and finance had fewer workers compensation cases reported to occupational health and safety authorities.

2.9: Social Protection

Table 17: Coverage of Standard Benefits, by Industry, 2002 (%)

Industry	No Standard Benefit	Super.	Holiday Leave	Sick Leave	Long Service Leave	Maternity/ Paternity Leave	% entitled to a benefit
Mining	1.4	97.5	89.9	89.1	83.6	20.5	98.6
Construction	9.2	88.9	66.5	66.2	60.2	11.6	90.8
Transport & Storage	8.0	89.8	74.1	73.9	65.8	19.9	92
Manufacturing	3.3	95.2	83.1	82.7	74.1	19.3	96.7
Agriculture, Forestry and Fishing	14	84.0	43.2	44.5	29.5	8.0	86
Personal and Other Services	10.8	86.2	74.3	74.0	64.8	28.8	89.2
Health and Community Services	4.2	93.4	76.5	76.8	71.6	33.3	95.8
Wholesale Trade	4.5	93.9	77.1	77.8	64.4	15.4	95.5
Accommodation, Café &Restaurants	15.5	81.6	42.3	42.7	33.5	10.6	84.5
Electricity, Gas & Water Supply	0.8	97.5	93.5	92.7	90.6	47.4	99.2
Cultural and Recreational Services	14.5	84.0	57.5	59.6	49.2	20.7	85.5
Retail Trade	19.3	77.9	53.6	54.2	44.4	11.7	80.7
Communication Services	3.6	96.2	85.0	85.5	76.7	38.3	96.4
Government Administration & Defence	1.4	97.8	91.0	91.5	89.0	54.0	98.6
Property & Business Services	**7.4**	**91.0**	**71.5**	**71.0**	**55.8**	**18.2**	**92.6**
Education	4.6	94.3	78.3	80.7	77.9	47.1	95.4
Finance & Insurance	2.3	96.4	86.8	86.2	81.2	39.5	97.7
All Industries	**8.2**	**89.9**	**71.4**	**71.7**	**63.3**	**24.1**	**91.8**

Source: ABS, Employee Earnings, Benefits and Trade Union Membership, Cat. No. 6310.0, 2002.

The employment benefits enjoyed by workers in property and business services are generally superior to those available to the Australian workforce but generally inferior to those available to other white-collar sectors such as Finance and Insurance, Education and Government Administration. This is true in relation to superannuation, holiday leave and sick leave. In relation to some employment benefits, notably sick leave and especially maternity/paternity leave, the coverage is beneath the average across Australian workplaces. The

proportion of employees in Property and Business Services who do not receive any of the 'standard benefits' in Australian workplaces is similarly just beneath the national average but noticeably higher than Finance and Insurance, Education and Government Administration.

Table 18: Type of Superannuation Coverage, by Industry, 2000

Industry	Employer Contributions	Personal/ Spouse Contributions only	Superannuation but no current contributions	No Superannuation
Mining	94.0	-	3.4	2.6
Construction	53.1	9.7	17.4	19.8
Transport & Storage	73.7	5.1	9.9	11.4
Manufacturing	85	2.6	5.7	6.7
Agriculture, Forestry and Fishing	44.9	11.1	15.1	28.9
Personal and Other Services	69.9	4.1	10.3	15.6
Health and Community Services	86.1	3.1	4.3	6.5
Wholesale Trade	81.1	3.4	7.7	7.8
Accommodation, Café &Restaurants	69.2	1.7	8.8	20.3
Electricity, Gas & Water Supply	96.4	2.2	1.5	-
Cultural and Recreational Services	67.8	4.7	10.1	17.4
Retail Trade	63.2	2.5	7.4	26.8
Communication Services	81.9	2.1	11.0	5.0
Government Administration & Defence	92.8	2.8	2.4	2.0
Property & Business Services	**71.6**	**5.3**	**12.3**	**10.8**
Education	87.1	2.1	4.9	5.8
Finance & Insurance	88.3	3.1	4.9	3.7
All Industries	**74.4**	**4.1**	**8.5**	**13.0**

Source: Australian Bureau of Statistics, *Superannuation: Coverage and Financial Characteristics*, Cat. No. 6360, 2001,

In Australia, employer-provided superannuation is the dominant type of superannuation and expected to be the primary source of retirement income into the future. The proportion of employees in Property and Business Services who have employer-provided superannuation is just beneath the national average – significantly lower than other white-collar sectors such as Education, Finance and Government Administration and major blue-collar sectors such as Mining, Manufacturing and Electricity, Gas and Water. The proportion of

employees in Property and Business Services who have superannuation but no current contributions from their employer is 3rd-highest relative to other sectors. Only a small proportion are the sole contributors to their superannuation funds but here also Property and Business Services ranks 3rd-highest relative to other sectors. The proportion of employees who have no superannuation is just beneath the national average but, overall, access to superannuation within Property and Business Services is poor by comparison to Australian workplaces, especially other white-collar workplaces. The uneven distribution of social benefits such as superannuation probably reflects the contemporary emergence of ICT, the limited reach of legal instruments through which employment benefits are diffused (e.g. industrial 'awards') and low levels of union membership (see below).

2.10: Balancing work with family life

Balancing work commitments with non-work commitments is one of the key issues in contemporary Australian workplaces. In general terms a significant proportion of workers, particularly parents, have reported relatively high levels of dissatisfaction with work-family balance.

ICT work in Australia is characterised by certain conditions which makes it more likely that these workers will express dissatisfaction with work-family balance – long hours of work, a degree of work intensification and the fact that much ICT work in Australia is project-based rather than time-based. On the other ICT has features which might be thought to mitigate some of the negative impact of these features on work-family balance – most ICT workers are professionals and managers who may well enjoy a greater degree of control over their working times that might facilitate a better work-family balance than that which can be achieved by less skilled, less highly paid and less autonomous workers.

Table 19 shows workers' average levels of satisfaction with their flexibility to balance work and non-work commitments.

Table 19: Satisfaction with Flexibility to Balance Work and Non-Work Commitments, Business and Information Professionals and All Employees, 2001

	Satisfaction (0 – 10)
Business and Information Professionals	7.61
All other employees	7.37

Source: HILDA 2002 unpublished data.
Note: Satisfaction is scored such that 0 = Totally dissatisfied, 10 = Totally satisfied.

While there is not a major difference between the levels of satisfaction, Business and Information Professionals are a little more satisfied on average with their flexibility to balance work and non-work commitments.

2.11: Social dialogue and workplace relations

Table 20: Union Membership & Density, Business, Organisation and Computing Professionals, 1997-2001

	1997		2001	
	Membership	**Density (%)**	**Membership**	**Density (%)**
Business, Organisation & Computing Professionals	39, 550	11.6	45, 500	9.0
All Occupations	2,110,300	30.3	1, 902, 700	24.5

Source: Unpublished data, ABS, Employee Earnings, Benefits and Trade Union Membership, Cat. No. 6310.0, 1998 & 2002.

Union membership is low but rising amongst Business, Organisation and Computing Professionals. Union membership increased by almost 6,000 between 1997-2001 but union density still fell marginally from 11.6 to 9.0 per cent. Union presence amongst ICT employees therefore remains marginal although the Australian Services Union is now actively trying to organise employees in the sector. During the same period, both union membership and density fell significantly across all occupations.

Table 21: Industrial Disputes, Working Days Lost (WDL) Per Thousand Employees, by Selected Industries, 2002

Industry	Coal Mining	Metal Product, Machinery & Other Equipment Manufacturing	Construction	Education, Health & Community Services	Other Industries	All Industries
WDL	357	88	220	3	9	32

Source: ABS, Industrial Disputes, Cat. No. 6321.0, July 2003.

Industrial disputation is very low within the IT sector. Exactly how low cannot be stated because the ABS groups industries with no or low levels of industrial disputation together as 'other industries'. As a group, 'other industries' lost 9 working days per 1000 employees – well beneath blue-collar, unionised sectors such as Coal Mining, Metal Product Manufacturing and Construction but higher than Education, Health and Community Services.

Table 22: Methods of Employee Involvement, by Industry, 1995 (%)

Industry	Joint Consultative Committee	Quality Circle	Task Force or Ad-hoc joint committee	Employee Representatives on board of managers/ directors	Semi or fully-autonomous work groups
Mining	11	38	63	2	34
Manufacturing	19	41	34	8	48
Electricity, Gas & Water Supply	25	58	53	8	45
Construction	18	37	23	14	45
Wholesale Trade	12	36	32	15	34
Retail Trade	9	8	12	5	26
Accommodation, Café &Restaurants	6	6	8	9	29
Transport & Storage	18	38	28	2	35
Communication Services	22	47	42	16	48
Finance & Insurance	17	17	45	7	45
Property & Business Services	**10**	**23**	**50**	**16**	**51**
Government Administration & Defence	8	60	68	9	49
Education	11	55	73	52	65
Health and Community Services	14	38	44	17	37
Cultural and Recreational Services	12	24	34	14	43
Personal and Other Services	16	39	38	13	42
All Industries	**13**	**33**	**38**	**16**	**43**

Source: A.Morehead et. al. (1997*), Australian Workplace Industrial Relations Survey*, Appendix Table A9.4b.

The diffusion of techniques for enhancing employee involvement in Property and Business Services is uneven but overall better than Australian workplaces in general. The proportion of workplaces with joint consultative committees was low but only just beneath the national average. More workplaces in Property and Business Services have quality circles but their usage is still beneath the national average. However, a high and above-average number of workplaces have task forces or ad-hoc joint committees and semi or fully-autonomous workgroups. These forms of employee involvement operate as an alternative to methods such as joint consultative committees whilst the high proportion of semi or fully-autonomous workgroups is indicative of a high diffusion of advanced techniques for employee involvement.

Table 23: Employee Assessments of Workplace Relations, by Industry, 1995

Industry	Fair Say	Managers Try to Get on with Employees	Trust Managers
Mining	61	55	32
Manufacturing	57	58	35
Electricity, Gas & Water Supply	41	40	18
Construction	55	63	42
Wholesale Trade	54	57	38
Retail Trade	43	62	46
Accommodation, Café &Restaurants	55	70	54
Transport & Storage	48	52	31
Communication Services	49	55	28
Finance & Insurance	54	61	38
Property & Business Services	**56**	**62**	**42**
Government Administration & Defence	44	50	26
Education	45	61	41
Health and Community Services	43	54	34
Cultural and Recreational Services	43	59	41
Personal and Other Services	49	53	34
All Industries	**54**	**58**	**37**

Source: A.Morehead et. al. (1997), *Australian Workplace Industrial Relations Survey*, Appendix Table A9.4b. Estimates were based on affirmative employee responses to the following questions:

a. Do you think that you were given a fair chance to have a say about the changes that have happened at this workplace over the past 12 months?

b. Do you agree or disagree with the following statements?

    a. Management at this workplace does its best to get on with employees?
    b. Management at this workplace can be trusted to tell things the way they are?

The evidence on forms of employee involvement is reinforced by employee assessments of workplace management and relations. The proportion of employees who agree managers give them a 'fair say' in workplace changes, trust their managers and say their managers do their best to try to get on with employees is higher than the national average and other white-collar sectors such as Education, Finance and Government Administration.

Table 24: Coverage of Employees by Pay Setting Arrangements, May 2000 (%)

	Award	Collective Agreement	Individual Agreement: Registered	Individual Agreement: Unregistered
Mining	5.9	39.8	10.4	44.0
Manufacturing	11.4	37.1	1.9	49.7
Electricity, Gas & Water Supply	1.4	76.5	4.2	17.9
Construction	15	23.8	0.3	60.9
Wholesale Trade	12.1	10.8	1.7	75.4
Retail Trade	34.9	28.6	1.5	35.0
Accommodation, Café &Restaurants	64.7	6.7	1.0	27.6
Transport & Storage	18.4	40.1	0.8	40.7
Communication Services	1.5	69.4	12.3	16.7
Finance & Insurance	5.6	49.9	5.3	39.2
Property & Business Services	**20.7**	**11.1**	**1.4**	**66.8**
Government Administration & Defence	15.3	75.9	3.6	3.2
Education	13.6	77.2	1.4	7.8
Health and Community Services	37.4	43.5	0.7	18.4
Cultural and Recreational Services	18.9	33.3	1.7	46.1
Personal and Other Services	27.1	42.7	0.3	29.8
All Industries	**23.2**	**36.7**	**1.8**	**38.2**

Source: Department of Employment and Workplace Relations and the Office of the Employment Advocate, (2002), *Agreement Making in Australia under the Workplace Relations Act, 2000 and 2001*.

The proportion of employees in Property and Business Services whose wages and employment conditions are determined either by the Australian Industrial Relations Commission or collective bargaining is relatively low. The pay and conditions of just 11.1 per cent of employees is set through a collective agreement – less than one-third the national average – which reflects the low presence of trade unionism. Around two-thirds of employees in Property and Business Services are covered by individual, common law employment contracts which is the second-highest in Australia. Around one-in-five employees have their pay adjusted annually and regulated by the 'awards' of the Australian Industrial Relations Commission.

2.12: Enhancing capacities for employment

Australia has a relatively highly developed vocational education and training system, which alongside compulsory schooling and a relatively large University sector, develops the skills and employability of Australian citizens.

Accurate data on the level of vocational education and training (VET) undertaken in ICT across all Australia is difficult to access. However, individual state authorities do maintain relevant data. Some of the trends in VET in ICT are analysed on the basis of a study of ICT employment in Australia's second largest state, Victoria.

At least up until 2001 training demand for VET training in ICT in Victoria continued to grow. The main trend has been a growth in higher level (Diploma and Graduate Diploma) qualifications offered through Tertiary and Further Education (TAFE) complemented by private providers. This appears to be associated with younger students seeking a pathway into University IT studies or directly into the industry.

IT Traineeships have a role in the industry, however, despite some growth, that role continues to be marginal.

The critical training in IT continues to centre on industry certifications. These have traditionally been provided by private providers outside the formal VET system. There is strong evidence that at least some TAFE colleges are now capitalising on this considerable market. Invariably these arrangements are based on a strong collaboration between a TAFE college and a large employer for the delivery of customised training on a fee-for-service basis. Employer evaluations of these arrangements are generally very positive.

There has traditionally been a very strong self-development culture in the IT industry – applicants are expected to possess the skills they need to do the job and are expected to develop any further skills they need on-the-job or in their own time. This culture is clearly alive and well in the industry. In fact, the self-development culture has been strengthened as the downturn cuts into company training budgets.

It is apparent that the downturn in the IT industry in Victoria has had a significant effect on the training investments being made by employers. Employers have generally been cutting training budgets – in some cases to zero. This has placed an even greater expectation on individual employees that they will source, access and fund their own training.

IT employers have also come to increasingly rely on informal on-the-job training given constraints on training budgets. Tighter employment profiles however have made it increasingly difficult for employers to spare experienced professionals to assist with the development of newer employees.

Over the past decade the IT training and skills formation system in Victoria has witnessed a 'feast and famine' cycle. In the late 1990s IT skills were allegedly

in desperately short supply. Since 2001 they have been in excess. This might be seen as an inevitable consequence of a highly market-based system. With highly atomised actors (individual firms, individual workers and a plethora of individual providers), volatile demand, and quickly changing skill needs and with no institutional mechanism to stabilise demand, the IT skills market has swung through dramatic peaks and troughs.

Workers and firms are reacting to the market signals and there are signs that the stock of IT skills is rapidly declining. The downturn in the industry appears to be flowing through to lower University enrolments in IT courses. In 2002 the total number of commencements in ICT courses in Victorian Universities fell by 25% compared to the previous year – an 18% decline in undergraduate commencements and a 36% fall in postgraduate commencements (IT Skills Hub 2003: 19). It may be that the 'self-development' training culture, the decline in training budgets and market-based skill formation system will lead to serious skill shortages if the industry begins to expand once again.

This analysis of ICT training opportunities and skill formation in one representative state, Victoria, suggests that there is little problem with access to ICT training in Australia.

Job opportunities in ICT, however, fluctuate quite dramatically with the fortunes of the sector, dominated as it is in Australia by computer consultancy. Nevertheless, despite the recent downturn in the sector and the excess of ICT labour available in the labour market, there are still reasonable job opportunities available.

HILDA provides some data on workers' satisfaction with the job opportunities available to them.

Table 25: Satisfaction with Employment Opportunities, 2001

	Satisfaction (0 – 10)
Business and Information Professionals	7.29
All other employees	7.28

Source: HILDA 2002 unpublished data.
Note: Satisfaction is scored such that 0 = Totally dissatisfied, 10 = Totally satisfied.

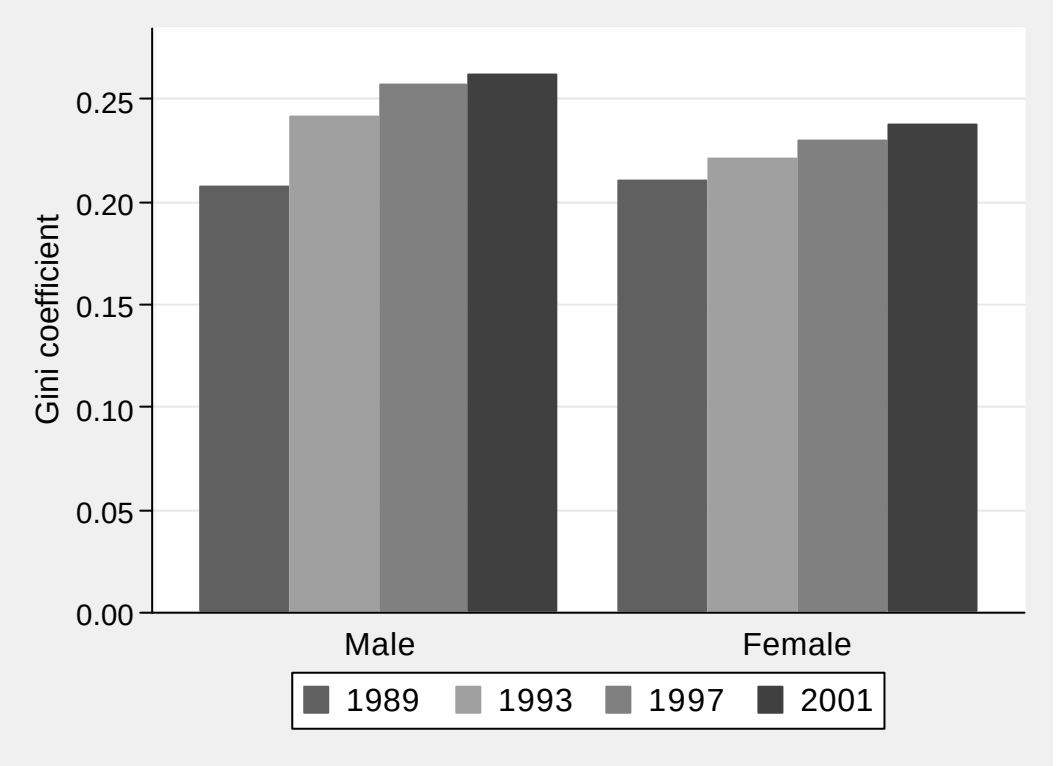
Despite strong jobs growth in ICT throughout the 1990s, Business and Information Professionals are not much more satisfied on average with the employment opportunities available than other employees. This may well reflect the depressed labour market conditions for job-seekers associated with the recent downturn in the industry. Nevertheless, as can be seen from the data, levels of satisfaction are generally quite high.

2.13: Socio-economic context

Basic data on Australia's general labour market conditions are provided in Table 5.

In terms of other dimensions of Australia's socio-economic context one of the major issues concerns rising levels of inequality. Throughout the 1990s earning inequality increased for both males and females, although the trend was more pronounced amongst men than women.

Figure 3: Earnings Inequality by Gender (Gini Coefficients) Australia, 1989-2001



Source: Watson et al (2003): 115 from Unpublished ABS data.

Conclusion

Overall, it would appear that ICT has had a positive impact on the quality of work insofar as ICT employees generally register higher ratings than average across a range of labour market indictors. Compared to other sectors, ICT employees are relatively advantaged as well-paid employees with high-level skills working in an environment with significant autonomy. However, there are some recent developments which are less positive and perhaps indicate a role for policy in enhancing the quality of institutions in the sector. Of particular concern are:

- **The skills 'famine and feast' cycle**. The market-based skill formation system places major burdens on the time, income and energies of ICT employees to update their skills and may lead to skill shortages which constrain the future expansion of the sector

- **The uneven diffusion of general employment standards**. ICT employees are relatively privileged but a significant proportion of ICT do not receive standard benefits such as superannuation. The uneven distribution of social benefits probably reflects the contemporary emergence of ICT, the limited reach of legal instruments through which employment benefits are diffused and low levels of union membership.

- **Rising employee dissatisfaction**. Qualitative evidence, industry sources and the exit of employees from the ICT sector or to overseas ICT sectors point to rising employee dissatisfaction in response to reduced labour market opportunities, rising work intensification and less rewarding work. Falling university enrolments in ICT courses suggest perceptions that the ICT sector is no longer the extraordinarily high-paying, highly-skilled industry of the future that it was perceived to be. These trends are a concern in-and-of themselves but they also point to the possibility of future skill shortages.

ICT has a positive impact on the quality of work but there are now some question-marks over the sustainability of some of its skill and employment practices as the sector matures.

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