Tasmanian ICT Industry Sector Assessment Report

2008

About the Centre for Innovative Industry Economic Research:

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. CIIER 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 Strategic Group Ltd provides the analysis for this project.

Whitehorse. is an Australian owned management consulting practice specialising in ICT Market Research and analysis, ICT policy and strategy, especially in the Government sector, Information Management, and Economic Development.

Statistical Panel

Centre for Innovative Industry Economic Research Inc. Tasmanian ICT	July 2003	July 2008	Trend
Employees in Tasmanian ICT Industry	2,820 (1.33% of Aust ICT)	*3,558 (1.33% of Aust ICT)*	Up in number but static in percentage
Overall revenue of Tasmanian ICT Industry	$1.1b (1.8% of Aust ICT)	*$1.4 b (1.6% of Aust ICT)*	Up marginally in number but slightly lower in percentage
Revenue of Tasmanian ICT Industry software and services sector	$98.4 million (0.8% of Aust ICT)	*$252.9 million (1.44 % of Aust ICT)*	Significant increase in $ value and percentage of Australian market
R&D of ICT Industry (T250 only)	$11.3m	*$29 million*	Up significantly. Boosted by CSIRO

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.

TASICT received funding approval from the Intelligent Island MAPP program to perform a Tasmanian ICT Industry Capability Assessment to be conducted annually over a period of three years. The intent of this project is to assess the Tasmanian ICT sector size and structure, capabilities, diversity, rate of growth, economic contribution, export performance, market reach and investment attractiveness, and to identify opportunities, strengths and weaknesses of the Tasmanian ICT industry and determine the economic impact of ICT as an enabling industry in the State economy. The Project aims fall into four sub-projects;

1. Yearly Assessment of Tasmanian IT industry, including SWOT
2. Economic Impact statement
3. ICT Skills forecasting project
4. Developing an assessment mechanism and applying it to the support programmes indicated

This Report has been prepared to give an overview of the current state of the Tasmanian ICT sector, as of July –Dec 2008, based upon survey, workshops, case study and interview, and other statistical sources. Additional reports this year will include a review of ICT sector Innovation and R&D, both private and public, with a *SWOT* analysis of research and innovation; and a report on Tasmanian ICT Industry Skills profile and needs. Annual ICT Sector assessments will be produced in 2009 and 2010.

Research Support

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. This research has also been greatly assisted by the helpful cooperation of the Premier, the Tasmanian Government, and the TasICT board and, in particular, by the TasICT Project manager, Roy Pallett

The work is also supported by the partners and staff of Whitehorse Strategic Group Ltd, who have generously provided access to the valuable intellectual property that has formed the basis of the CIIER economic models.

Those current and former Whitehorse Partners and Senior Consultants are:

David Goble	David Dennis
Ana Govan	Richard Hogg
Ian Wells	Phil Kowalski
Bettina Harlos	Ian Dennis

Research background

CIIER ICT Industry & sector mapping

During a recent CIIER project for the (then) Department of Communications, Information Technology, and the Arts, DCITA), analysing the Australian Software Industry, an industry and sector mapping analysis structure tailored for ICT, and especially for software and services, was developed. That research underpins this study and lays the foundation for our analysis.[1]

To map ICT industry activities, we developed a framework for analysing the ICT industry and ICT value chain and a schema for presenting the actors and activities involved in the ICT industry. These *analytical* and *presentational* frameworks are described in turn.

Mapping the ICT product system (the analytical framework)

The ICT product system analytical framework was developed by Dr John Houghton, of the Centre for Strategic and Economic Studies at Victoria University, and extended with other CIIER researchers.

As was noted in the DCITA study, there are many possible approaches to mapping ICT industry activities and markets, ranging from various forms of cluster analysis to value chain/value system, product and innovation systems analysis. Each provides a particular perspective that is more or less suitable to a particular type of study or enquiry.

Within these approaches there are many overlapping and cross cutting dimensions. One basic distinction is that between those studies using clusters in a statistical sense (i.e. a grouping of entities according to some specific characteristic) and those intending to imply actual relationships between the objects (i.e. networks, value or product systems). When clustering is studied it can be in terms of any number of characteristics (e.g. location, activity or product field, firm strategy, behaviour, innovative or competitive performance, size, technology or science base) and involve a range of methodological approaches (e.g. factor analysis, cluster analysis, multi-dimensional scaling, etc.).

Network, value chain or product system relationships include linkages of various kinds (e.g. supply chain, user–producer relations, supplier–producer relations, innovation linkages, information and/or knowledge flows) and study typically involves more qualitative methods (e.g. case studies or representative sampling).[2] One such approach, the product system approach, was pioneered by the United Kingdom's Complex Product Systems Innovation Centre.[3] It is a technique that focuses on linkages between actors in a complex system that affects the transformation of activities and materials into goods and services through the processes of creation, production and distribution. Hobday, Rush and Tidd (2000) suggested that: because each new product tends to be different, and because development and production involves feedback loops from later to early stages and other unpredictable, 'emerging' properties, innovative organisational structures are required to coordinate production, particularly where there are uncertain and changing user requirements and technological possibilities. There is often high production and innovation complexity, not only because a wide variety of distinct components, skills and knowledge inputs are involved, but also because large numbers of firms or different organisations often have to work together in production (e.g. prime contractors and systems integrators,

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[1]   CIIER report " Software Industry in Australia, Globally Competitive, Domestically Undervalued" , 2005

[2]   Vock, P. (1997) 'Swiss Position Paper on Mapping Innovative Clusters,' OECD Workshop, Amsterdam, October 1997.
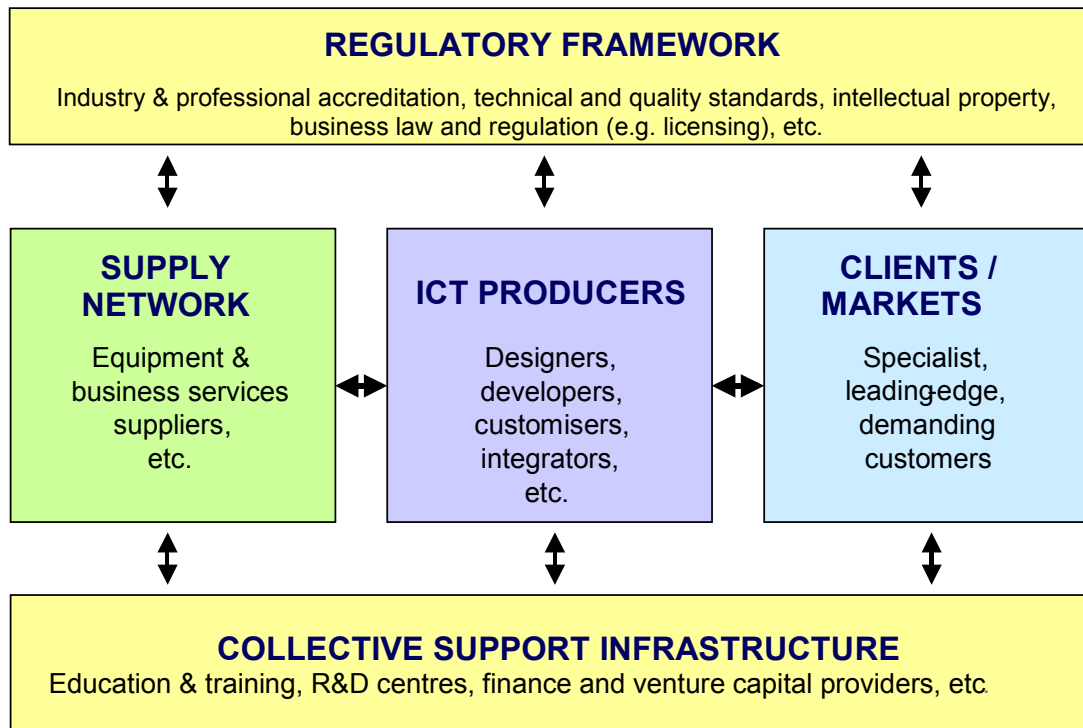
[3]   See Hobday, M., Rush, H. and Tidd, J. (2000) 'Innovation in complex products and system', *Research Policy* 29(2000), pp793-804 and related papers in that special issue of *Research Policy* for an overview and introduction.

users, buyers, other suppliers, small and medium sized enterprises, government agencies and regulators).[4] Such a characterisation fits the ICT industry.

A typical schematic product system includes five major elements, with three groups of key actors and activities forming the core value chain. Figure 1 illustrates a basic schematic product system:

- o At the centre are the *ICT firms* engaged in the development of ICT and ICT based solutions;
- o To their left, the *supply network*, which includes all the providers of specialist equipment and financial, business and other services to ICT producers; and
- o To their right, the *distribution network*, which includes all the clients of ICT firms (be they intermediaries or final customers).
- o Their activities of these groups are supported by a collective support infrastructure and operate within an overarching regulatory framework.
- o The *collective support infrastructure* includes R&D centres, education and training institutions, professional associations, specialist consulting firms, finance and venture capital providers, etc.; and
- o The *regulatory framework* includes a wide range of industry and professional accreditation, technical and quality standards, intellectual property, licensing, etc.

A schematic product system

REGULATORY FRAMEWORK

Industry & professional accreditation, technical and quality standards, intellectual property, business law and regulation (e.g. licensing), etc.

SUPPLY NETWORK

Equipment & business services suppliers, etc.

ICT PRODUCERS

Designers, developers, customisers, integrators, etc.

CLIENTS / MARKETS

Specialist, leading-edge, demanding customers

COLLECTIVE SUPPORT INFRASTRUCTURE
Education & training, R&D centres, finance and venture capital providers, etc.
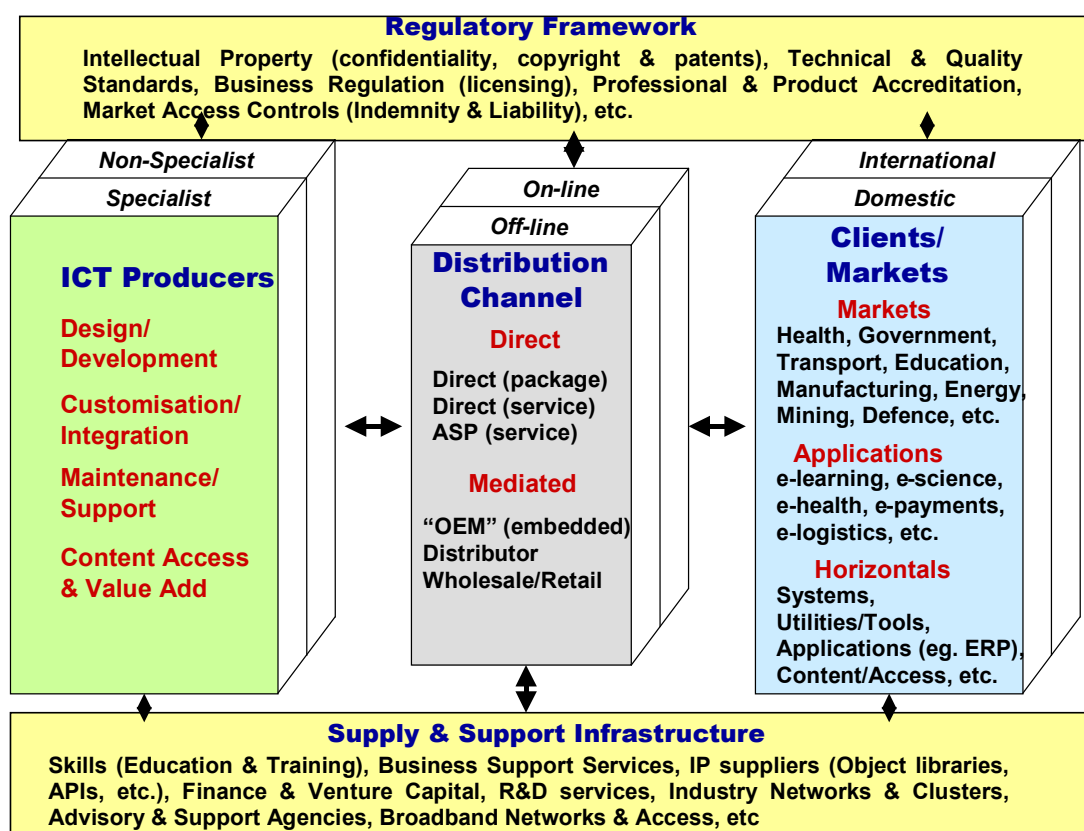
Source: CSES Analysis.

This basic schema was modified to draw out particular insights, taking into account that ICT-related capabilities can cut across applications and markets. For example, digital image manipulation capabilities can be an essential ingredient in the development of

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4   Hobday, M., Rush, H. and Tidd, J. (2000) 'Innovation in complex products and system', *Research Policy* 29(2000) pp793-804.

computer games, medical scanning and imaging, film and video special effects, production and editing, etc.

In the DCITA study, we identified the role of key actors in the value chain – as, for example, developers, distributors, integrators and/or value-added services providers. Given the importance of the distribution channel and distribution business models in the ICT industry, as well as the limited requirements of ICT firms for specialist inputs, we modified the traditional schematic product system structure outlined above – with the supply network included within the support infrastructure, and the distribution channel separated from clients/markets. This formulation reflects both the importance of the distribution channel in the ICT industry, and the focus of ICT sectoral studies on overall sectoral activities.

The ICT product system

Regulatory Framework
Intellectual Property (confidentiality, copyright & patents), Technical & Quality Standards, Business Regulation (licensing), Professional & Product Accreditation, Market Access Controls (Indemnity & Liability), etc.

Non-Specialist
Specialist

ICT Producers

Design/ Development

Customisation/ Integration

Maintenance/ Support

Content Access & Value Add

On-line
Off-line

Distribution Channel

Direct

Direct (package)
Direct (service)
ASP (service)

Mediated

"OEM" (embedded)
Distributor
Wholesale/Retail

International
Domestic

Clients/ Markets

Markets
Health, Government, Transport, Education, Manufacturing, Energy, Mining, Defence, etc.

Applications
e-learning, e-science, e-health, e-payments, e-logistics, etc.

Horizontals
Systems, Utilities/Tools, Applications (eg. ERP), Content/Access, etc.

Supply & Support Infrastructure
Skills (Education & Training), Business Support Services, IP suppliers (Object libraries, APIs, etc.), Finance & Venture Capital, R&D services, Industry Networks & Clusters, Advisory & Support Agencies, Broadband Networks & Access, etc

Source: CSES/CIIER Analysis.

Taking these considerations into account, we developed an ICT product system map (Figure 2) which includes:

- o *ICT producers*, including specialist firms and major non-specialist developers and producers, defined by their main activities – i.e. design, development, customisation, integration, support, etc.;
- o *The distribution channel*, defined by major channels of direct and mediated ICT distribution – i.e. direct (package or service) and mediated (embedded, wholesale/retail), be they on-line or off-line, etc.;

- o *Their clients and markets*, defined by industry/market or application and ICT industry linkages – i.e. market verticals (e.g. health, government, transport, education, etc.), application verticals (e.g. e-learning, e-logistics, e-payments, etc.) and horizontals (e.g. systems, utilities, tools, ERP applications, etc.), be they domestic or export;
- o The collective *supply and support infrastructure*, defined by activity and contribution – i.e. education and training, business support services, R&D centres, finance and venture capital providers, industry networks and clusters, etc.; and
- o The overarching *regulatory framework*, defined by scope and area of activity – e.g. intellectual property, business law (e.g. licensing), technical and quality standards, product and professional accreditation, etc.

The map provides a framework for thinking and analysis, which focuses on ICT production, distribution and market applications. This report addresses the ICT producers and distributors, defined as the Tasmanian ICT Industry. Further scheduled reports in this series will address aspects of the Tasmanian ICT Supply and Support Infrastructure.

CIIER "ICT Worker" Model

One of the other 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
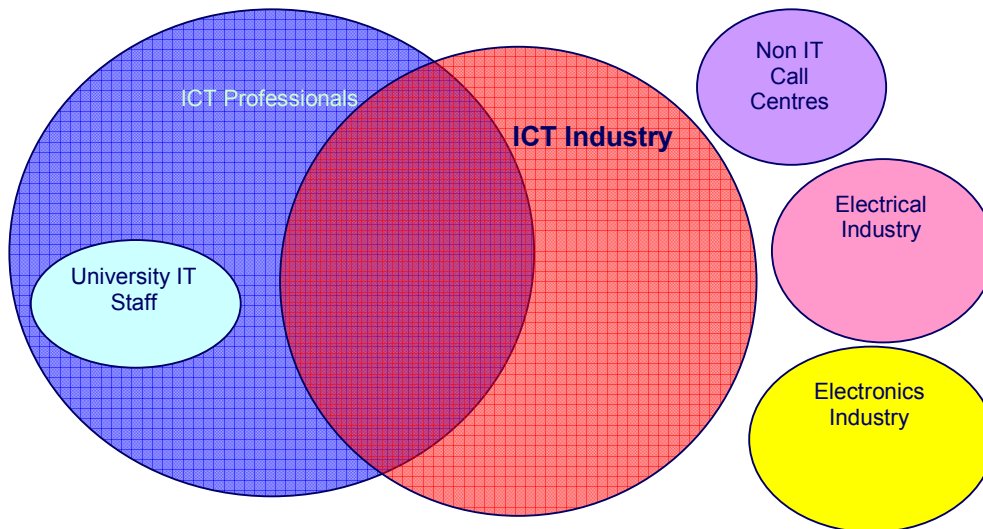
This "bubble" diagram illustrates some of these elements.

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[5], 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.[6]

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 below illustrates a Model, developed by CIIER and Whitehorse, which allows us 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)

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

Source ABS Labour force Feb 2006, ABS ICT Satellite account, Mar 2006, CIIER/Whitehorse T250 Dec 2005, DEWR Employment by State Dec 2005, Some data unpublished. CIIER modelling based on ABS paradigms. Copyright CIIER Inc 2006
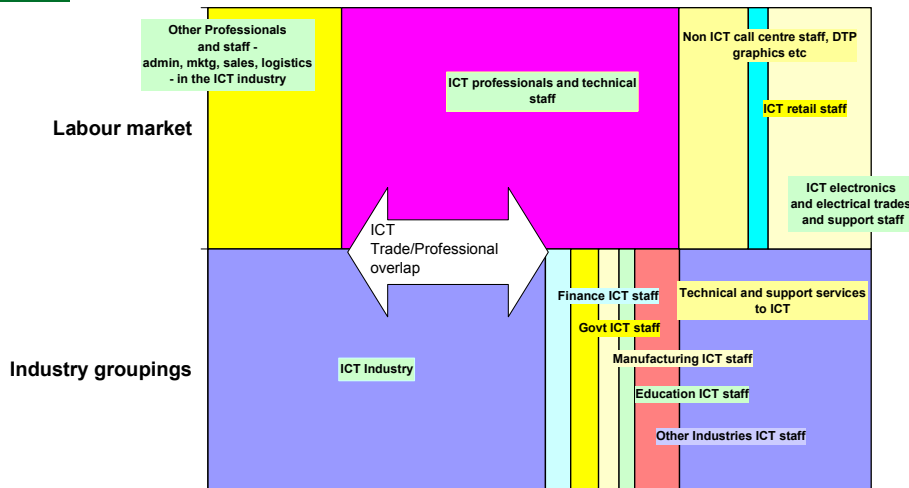
This new model also allows us to model ICT technical and professional employment, and therefore potential work-force demand, by industry sector. This can help in analysing, and quantifying skills needs, since each industry has some more specific ICT skill-sets among the more generic needs of every industry.

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5   ABS 8126-0

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

Survey and Analysis Process

The primary mechanism that is used to provide the quantification data for this and other Reports 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, $79 billion in revenue and over $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 between June and November 2008, represents approximately 53% of total current industry employment and 92% of total current industry revenues in the ICT industry in Australia.

A tailored version of this Survey has been developed for the more in-depth Tasmanian data required for this study, and a specific additional Survey of Tasmanian ICT businesses was carried out from September 2008.
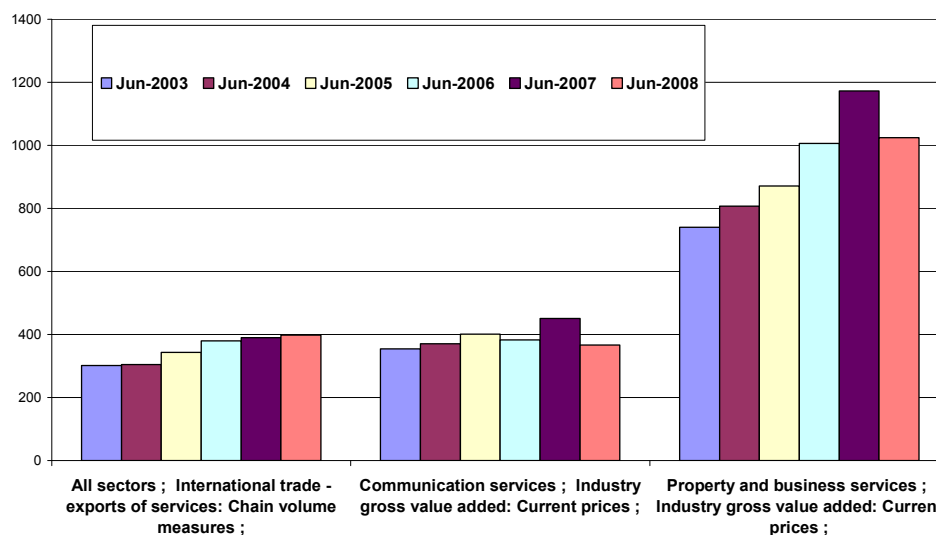
ICT in the Tasmanian Economy

Tasmania accounts for just 2.3 percent of the population and a smaller 2 percent of national output.

Relative to the national average, the Tasmanian economy has a greater reliance on agriculture, forestry and fishing and manufacturing than it has on ICT services and products. It also has one of the highest levels on export orientation amongst the states, although there has been some recent increase in the share of that economy accounted for by construction, finance and insurance and cultural and recreational services.

The island's economy is becoming more linked to that of the mainland via initiatives such as the Basslink electricity interconnection, the gas transmission pipeline, and greater sea and air access.

ABS National Accounts: State Accounts, movements in key indicators for ICT

The Tasmanian economy grew by 3.8% in 2007-08, ahead of forecast 3.25% growth. For 2008-09, growth has been forecast at 3.25%, but may be lower due to the international downturn since that forecast was made. Growth is likely to continue to be driven by exports, the housing sector and investments- especially in energy projects – both private and public. The increase in population growth to over 500,000 in 2007-8 is also a positive for the economy. Unemployment, at 3.7% (2008) is at its lowest in 30 years, and compares favourably to other States.

ABS lists Tasmania's Gross State product at $21.3 billion, as of June 2008.

Whilst the new ASIC industry classifications now include ICT, historical ones do not, however the bulk of the "Communication services" sector, and, according to DEWR, 56% of employment in the "Property and Business services" sector form major components of the ICT industry. Exports of services also include ICT services, although many other services are also included.

Taking these caveats into account, Tasmanian services exports have continued to grow since June 2003, as have both communication services and property and business services GVA[7].

The latest data, however, from June 2008, shows a distinct slowdown in both Communications and Property and business services sectoral GVA, reflecting the economic downturn. Some of this downturn will inevitably translate into slower economic growth, or contraction.

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[7]   GVA (Gross Value Add) is Gross Domestic Product less the impact of taxes and subsidies

Tasmanian ICT Industry Employment

The Tasmanian ICT industry employs just over 3,500 FTE. This equates to 1.32% of Australia's ICT industry employment, almost exactly the same percentage as the time of the last analysis in July 2003 (1.33%).

However, nationally, the demographic profile of the Australian ICT industry has changed significantly since then, with, in the main, the main smaller states growing there relative percentages, and larger states (Victoria and New South Wales), having less dominance. Most of this percentile growth, however, has taken place in the mining states of Western Australia, and Queensland driven by increasing demand for ICT services in the construction and mining industries.

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ICT Industry Employment Percentage by State July 2008

SA
4.4%

QLD
11.9%

ACT
3.2%

WA
7.8%

TAS
1.3%

NT
0.4%

NSW
40.3%

VIC
30.7%

Legend:
- VIC
- NSW
- QLD
- ACT
- SA
- WA
- TAS
- NT
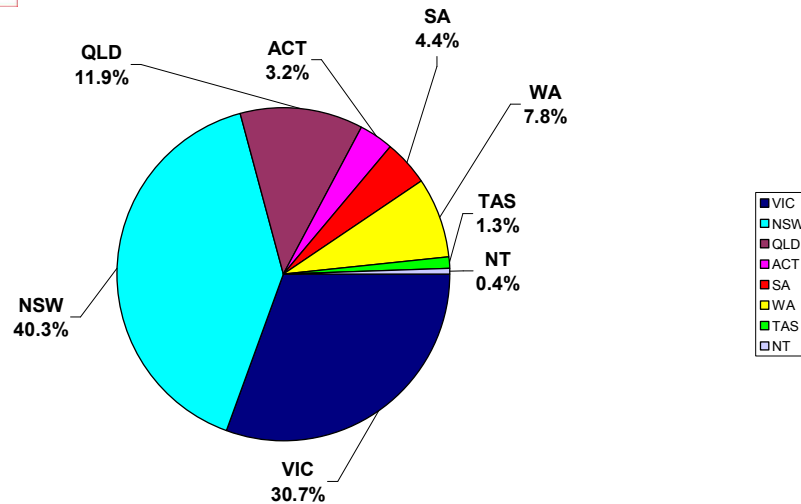
The annualised employment growth of ICT industry employment in Tasmania, at just over 4%, is however only marginally below the total Australian percentile growth of 4.31% over this period.

We consider that the main reason why ICT industry employment in Tasmania has not grown as significantly as in some other States, other than the impact of the mining boom, is that Tasmania has had a more significant employment exposure proportionally to the telecommunications sector, and this is the sector which has seen extended employment contraction, both in Tasmania and nationally.

ICT Industry Employment growth July 2003-July 2008 Tasmania and Australia
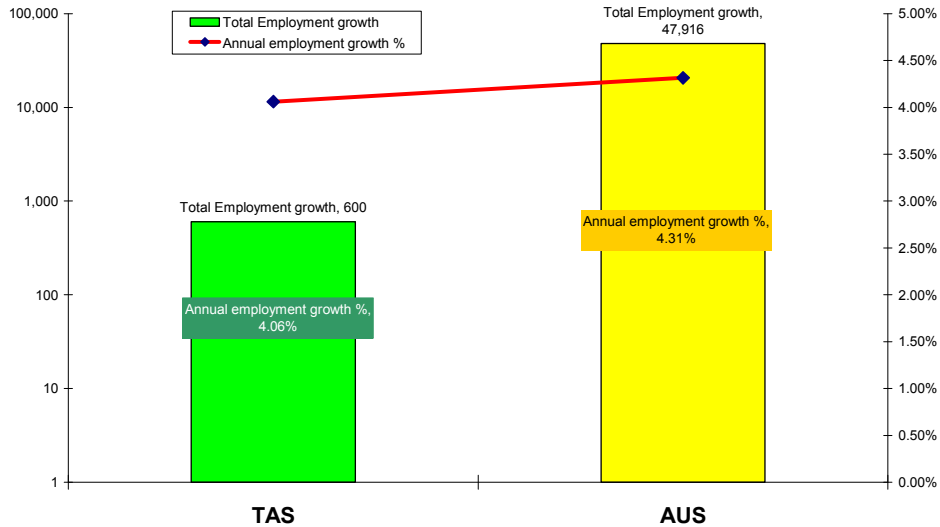
This is illustrated in the charts below, where, since 2006, national employment in distribution of hardware and software products has overtaken national employment in telecommunications services, whereas, in Tasmania, consulting and software services ICT industry employment is now more significant than telecommunications services employment.
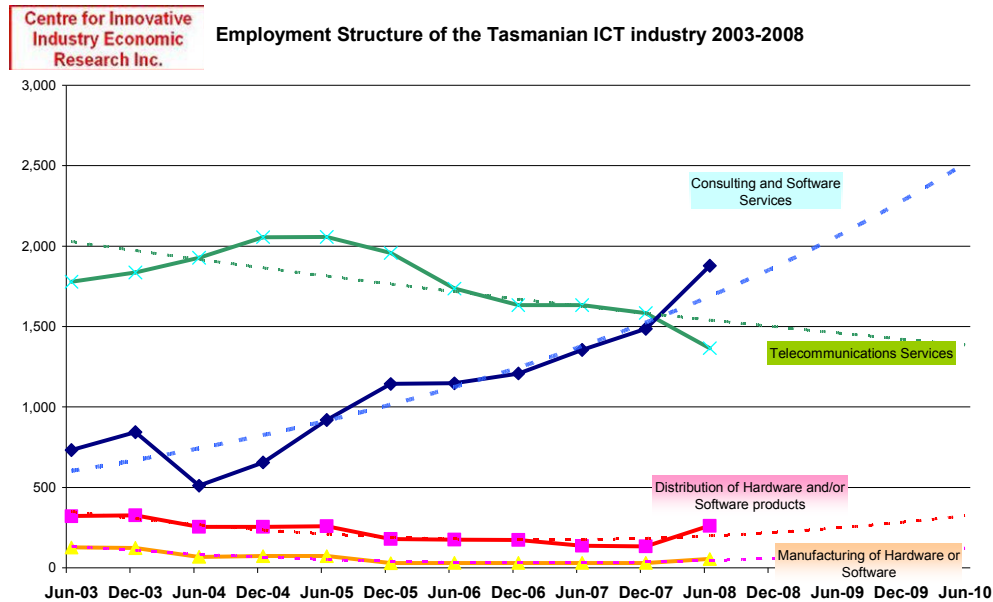
Employment Structure of the Australian ICT industry 2003-2008
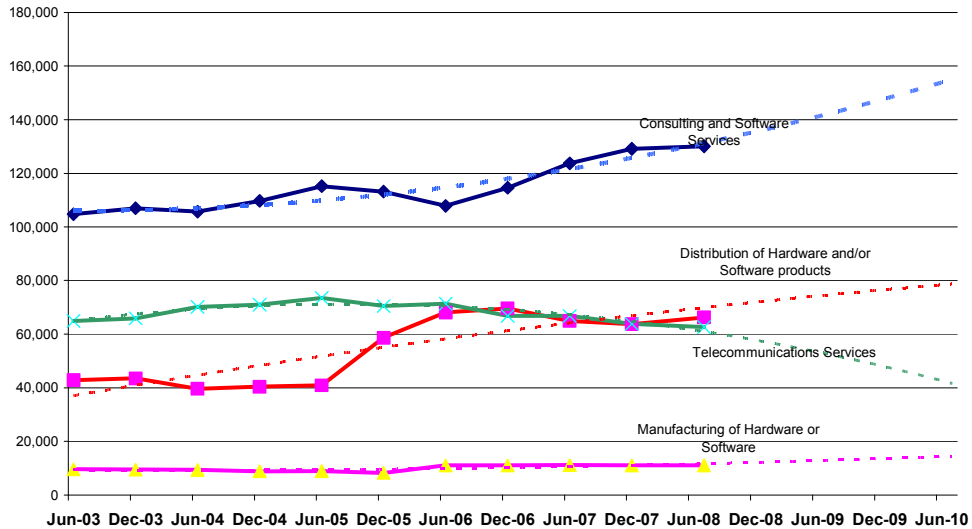
On the basis of various corporate announcements, and with the caveat of the impact of overall economic activity, these growth and contraction trends are, we consider, likely to continue, as most contraction announcements to date relate to companies operating within the telecommunications and distribution sectors. Whilst domestic software and services demand growth may slow as a result of economic turn down, it is considered unlikely that any structural, rather than economic, contraction will take place in this sector.

Whilst contractions in the telecommunications sector (e.g. Telstra, Optus) may continue to affect Tasmanian ICT industry employment, recent well-publicised announced contractions by major international distributors, (e.g. Hewlett-Packard, and Sun), will, we consider, have marginal effect in Tasmania.
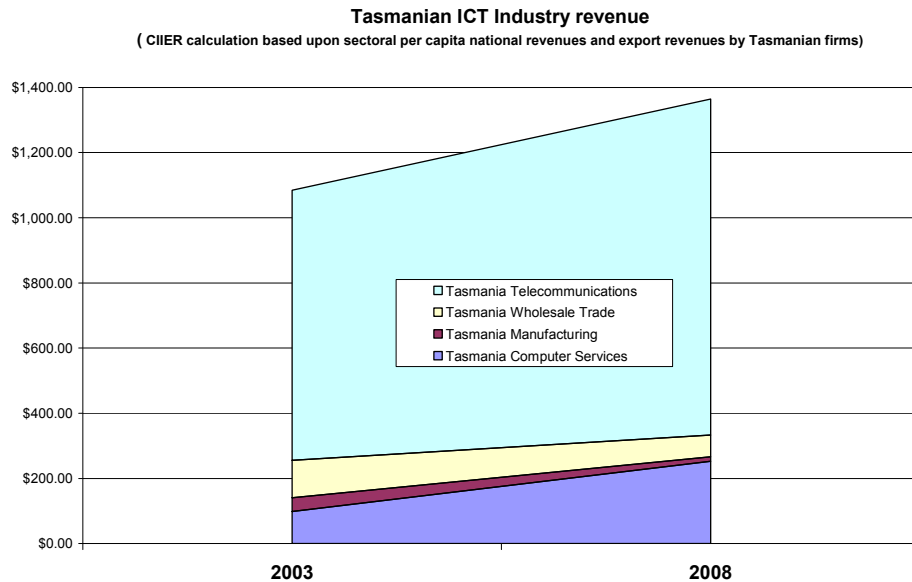
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Employment Structure of the Tasmanian ICT industry 2003-2008

The most important aspect of the changes in the structure of Tasmanian ICT industry employment is the necessity to ensure that programmes for ICT industry support recognise that the engines for growth are to be found mainly in companies providing consulting and software services and to a lesser degree, distribution of hardware and software products sourced elsewhere.

Of course, these categories are not completely exclusive, as many companies that provide consulting and software services may supplement these with products sourced outside Tasmania, whether from the rest of Australia or overseas. Conversely companies, which derive their primary income from the distribution of external derived hardware and software products, may also provide locally sourced consulting and software services. Nevertheless, it may be worth Tasmania considering programmes similar to those recently adopted by the Victorian government to maximise local ICT industry consulting and software services participation.

Tasmanian ICT Industry revenue

Unlike the trends in employment, telecommunications revenues have continued to rise nationally, and this is reflected in Tasmania. Other industry sectors have varied in their revenue trends. The overall 2008 Tasmanian result of $1.4 billion, whilst an increase in actual dollars on 2002-3, represents a lower percentage of Australian ICT industry revenue than during the last Survey, mainly due to the lower proportion of Tasmanians employed in the telecommunications sector now..
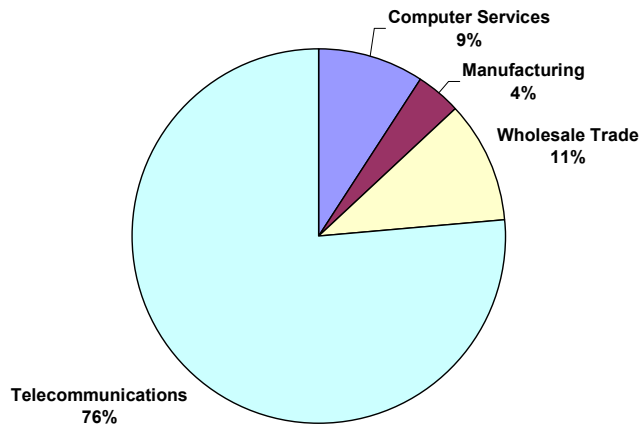
Tasmanian ICT Industry revenue
(CIIER calculation based upon sectoral per capita national revenues and export revenues by Tasmanian firms)

Whilst the overall increase is worthwhile, the performance of the software and services sector is outstanding, especially when distribution and manufacturing revenues have fallen over the period.

**Revenue of Tasmanian ICT industry - excluding telecommunications**
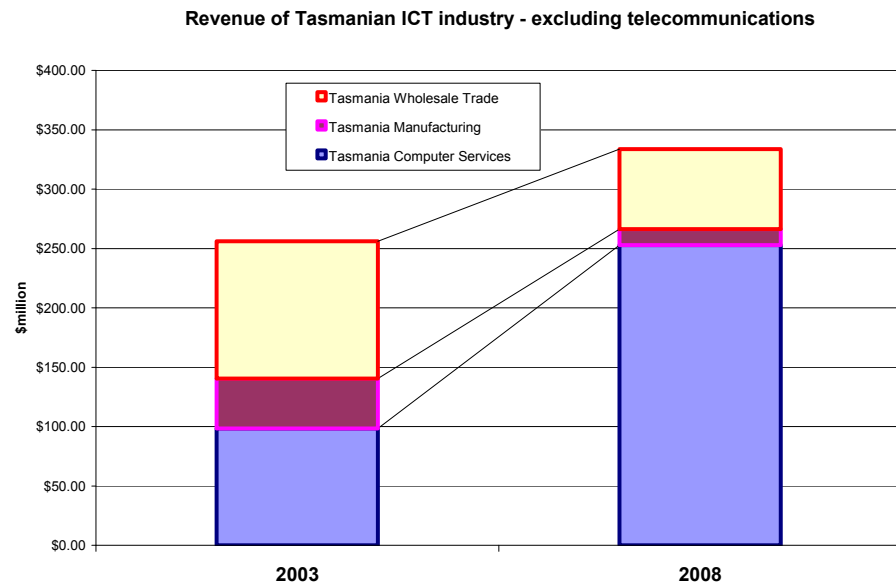
The change in the revenue map can clearly be seen, by contrasting the percentage each sector contributed to overall Tasmanian ICT industry revenues in 2003, with those now applying.

Tasmanian ICT Industry Revenue - 2003

Whilst software and computer Services represented 9% of revenues in 2000-3, they now represent over 19%, and the trend has been consistent over the last four years.

Tasmanian ICT Industry Revenue - 2008
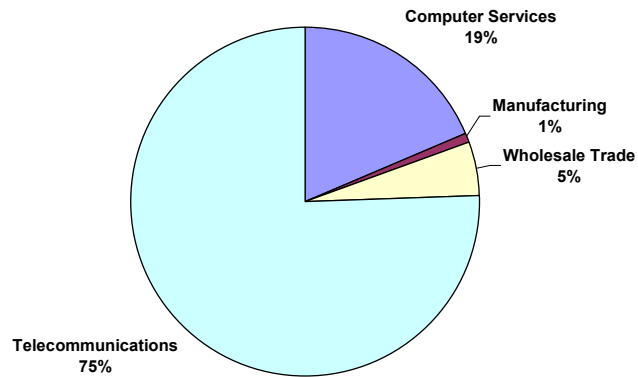
As a percentage of total Australian ICT industry revenues, Tasmanian software and computer services revenue has grown from under 1% of the Australian total to nearly 1.5%.

All other Tasmanian ICT industry sectors now represent a lower percentage of total Australian ICT industry revenue than was the case in 2003.

The growth in revenue for software and computer services, both in percentage and actual terms, mirrors that seen in employment demographics and reinforces the perception that a major shift in the structure of the Tasmanian ICT industry has occurred.

Tasmanian ICT Industry revenue trends, as percentage of Australian ICT industry
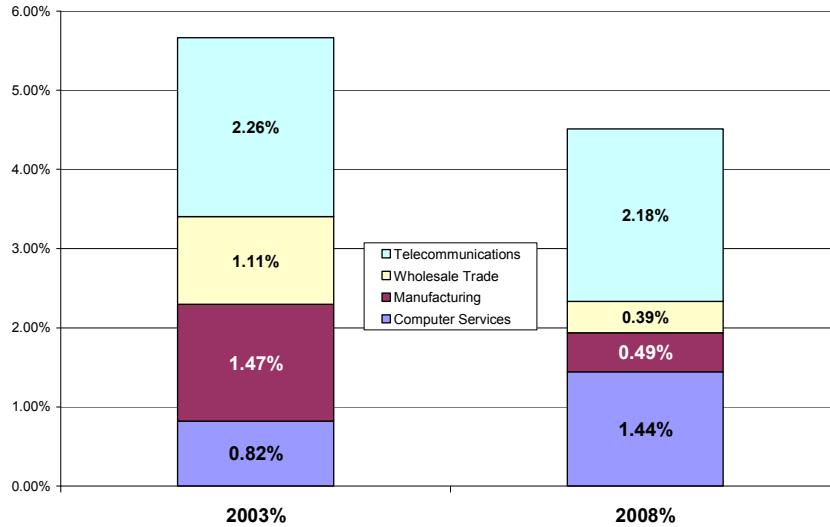
Innovation in ICT in Tasmania

Across the board, ABS data shows that around 2.01% of national GDP is expended on research, with the industry share in 2006/7 at 57.3% of this, up from 47.8% in 2000.

Historically, national ICT R&D has been at much higher ICT GDP rates than this and the ICT industry component as high as 92% of the total.

ICT R&D in Tasmania takes place across the ICT industry, and in a number of other industry sectors and public sector research groups. The recent report by the Australian Innovation Research Centre,[8] on responses from a total of 142 firms across a range of industry sectors, identified and analysed these matters in significant and telling detail. That research suggested that 90% of ICT firms were classified as "innovation-active", a far higher proportion than in many other industries.

The AIRC report concluded that "ICT is very important. We noted above that many ICT innovations are not counted here, because when an innovation in, say, printing involves ICT we counted it within printing and media. If a food firm began web marketing we counted that as a food innovation. What is counted here as ICT is primarily hardware and software that is being sold as an 'arms length' product. Even so this is large, and if we take it together with the ICT component of other innovations, it is clear that the effects of the ICT revolution are far from over in Tasmania."

The AIRC, for the purpose of this research, defined the ICT sector in terms of two ANZSIC divisions, namely J and M ("Information, media and telecommunications" and "Professional, scientific and technical services"). Defining the ICT sector in this way gave AIRC 179 firms in their dataset. However other 667 firms in the AIRC dataset, classified by them as outside ICT, were performing R&D. Of these, 206 (or 30.9%) cited information, computing and communications services as an application area. Turning to research fields, 222 firms (or 33.3%) cited information, computing and communications services as a field in which they were researching. The AIRC conclusion was that more responding firms are doing information technology R&D *outside* the ICT sector than inside.

CIIER supports both the methodology and the approach of AIRC, but is concerned at one aspect of their particular conclusions in relation to ICT.

Our concern is that, on the basis of the industry norms in Australia, many of the non-ICT firms conducting ICT R&D are likely to be doing so by engaging ICT firms to perform such tasks for them. This approach to research syndication or commissioning is a key component of the ICT industry research process. How such research is allocated by industry sector for cross-sectoral analysis, is indeed, as the AIRC research concedes, difficult.

ICT Industry R&D in Tasmania

The data below is derived from a Survey conducted since July 2008, with detailed responses from 35 ICT industry companies, spending over $29 million per annum on ICT research and development in Tasmania. Many of these firms are likely to have been included in the AIRC dataset. Naturally, as some firms did not respond, the actual expenditure will be higher, and the scope of ICT industry R&D wider, than that indicated. The research scope information below strongly supports the contention that a significant

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[8]   The Tasmanian Innovation Census

proportion of this research is being conducted for other industry sectors, and some for specific firms in other industry sectors.

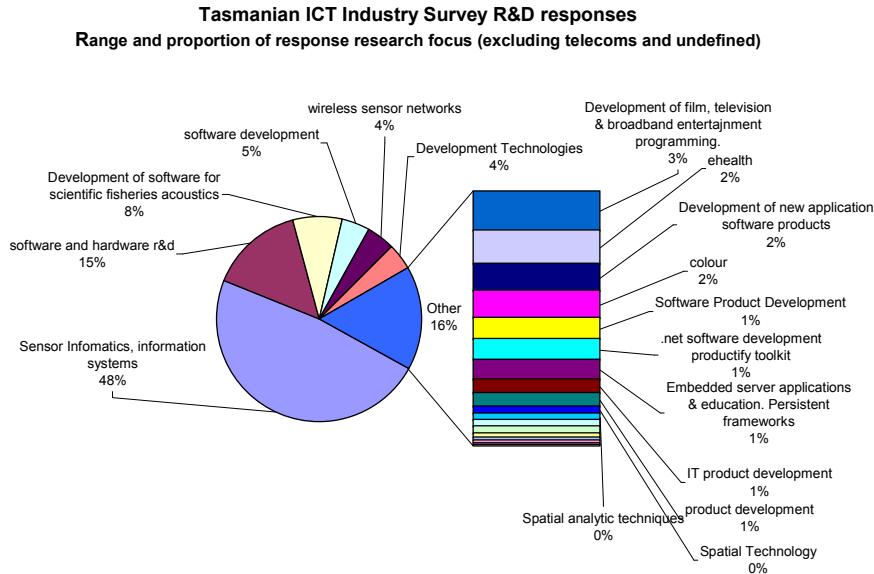**Tasmanian ICT Industry Survey, R&D expenditure by industry sector and major product/service**
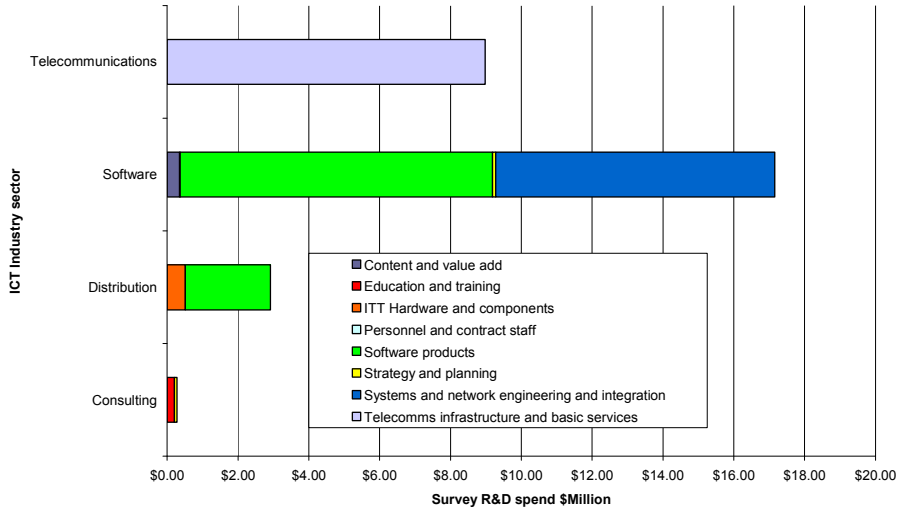
When companies are grouped by ICT industry sector, those companies classified as within software and software services now spend over $17 Million per annum on ICT R&D. The largest component of this expenditure is by firms specialising in software products, followed closely by those involved in systems and network engineering and integration. Distribution companies, i.e. those mainly involved in distributing non-Tasmanian products, also contribute a significant amount of local software product research. Some research also takes place specifically into education and training.

Tasmanian ICT Industry R&D, 2008 Survey response from 35 companies
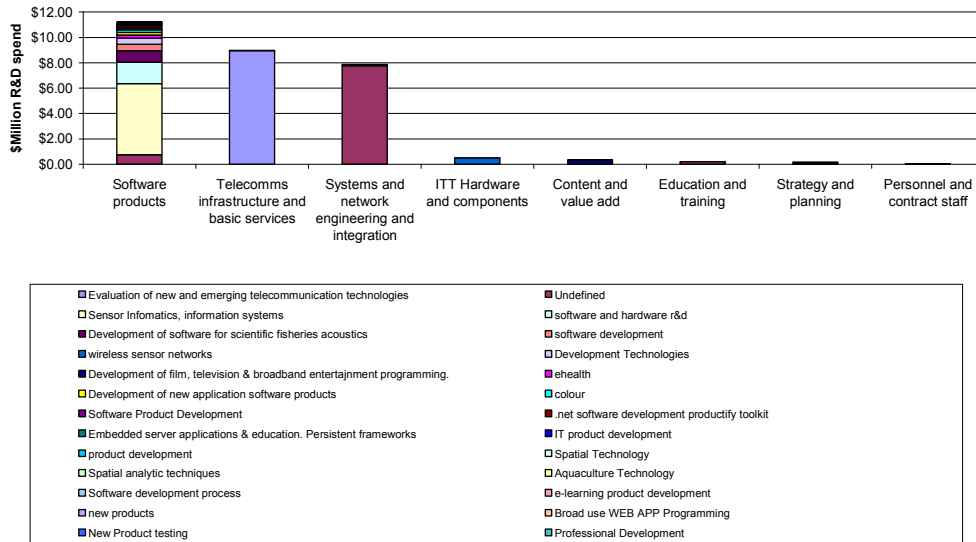
Whilst software products research is the largest component of expenditure, the range of focus of this research is the most diverse. Some of these foci may be able to be

rationalised in analysis, but, other than the strong focus on sensor informatics, the diversity reflects the fact that the aggregate R&D effort is derived from a larger number of small enterprises, each with their own agenda. The other aspect of these foci is that many of them are, indeed, related to other industry sectors, and likely to be components of the non-ICT industry ICT R&D identified by the AIRC study.

Tasmanian ICT Industry Survey R&D responses
Range and proportion of response research focus (excluding telecoms and undefined)

The range and diversity is amplified, if we exclude the monolithic telecommunications research focus and the "undefined" (where companies indicate that they do research but do not identify further). E.g. "scientific fisheries", "entertainment programming", "colour", "aquaculture technology".

In answers to other survey questions, nearly 56% of respondents indicated that their research was intended to create saleable products, one respondent answered specifically that it was not, and the rest refrained from commenting. Eighteen respondents said that their main ICT research centre was in Tasmania, one indicated Victoria as their main location.

The Tasmanian ICT industry performs well on R&D in comparison to the national norm, and contributes to a significant proportion of Tasmanian ICT research that has been attributed to client industries. The range and diversity of foci suggest that it may be difficult for critical mass to be achieved in all cases, and some concentration of research effort could result in more effective outcomes

Tasmanian ICT Industry Market Focus

Market concentration and focus also helps to identify where product research and market effort may develop useful synergies, both between companies with similar interests, and between companies and public-sector researchers.

Tasmanian ICT Industry client market concentration by personnel July 2008
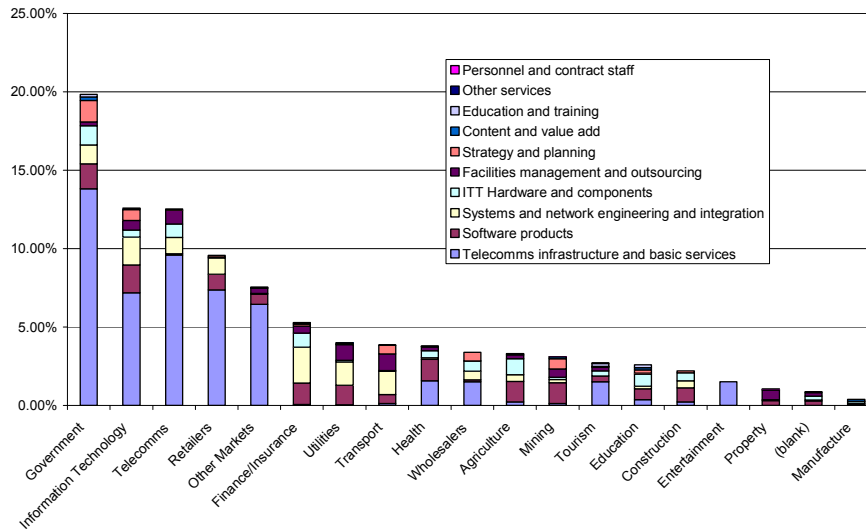
By analysing market focus on the basis of allocated personnel from software development and distribution companies, rather than on the basis of revenue, as additional weighting is automatically applied to markets that are important to those companies with higher levels of local employment, and thus, those more likely to be involved in more significant local product development.

The chart above shows client market concentration by type of company, and number of personnel. The top four markets are clearly: government; information technology; telecommunications; and retail. However, each of these markets is strongly featured within the telecommunications sector, so the chart following repeats the analysis, but excludes telecommunications.

**Tasmanian ICT Industry client market concentration by personnel July 2008
(excluding telecommunications services)**
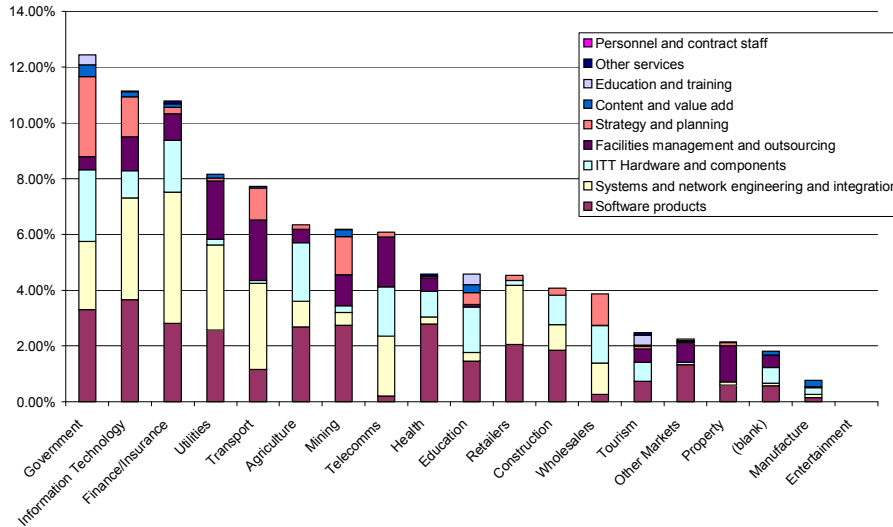
Unsurprisingly, some changes occur. However, government and information technology still feature as the top two client markets. (In this context, IT as a market would apply to two product groups: ICT tools used to develop or maintain ICT products and services; and the provision of ICT services, e.g. software development or systems analysis, by one ICT company to another).

The majority of industry sectors are featured; with between 4% and 8% of ICT personnel across a range of corporate types, within the target markets, and even the leading target markets are addressed by all sectors and would not be considered as dominant.

**Tasmanian ICT Industry product/service market concentration by personnel
July 2008**
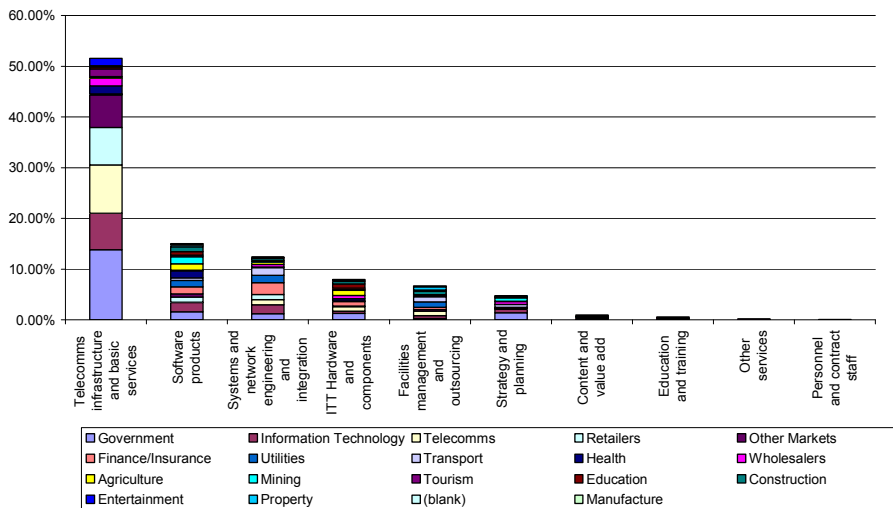
When the same data is analysed by its other axis, this spread of markets can be seen with even more clarity. Even the smallest groupings include multiple corporate types. This analysis strongly suggests that no single major client industry market is dominant in Tasmania, (e.g. as the mining industry is in Western Australia).

**Tasmanian ICT Industry Market focus by employment
- Australian owned v Multinational firms**
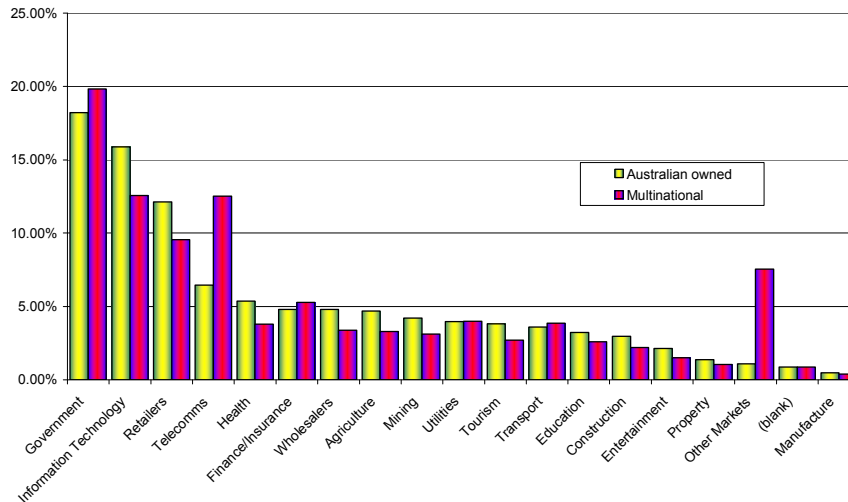
In order to identify whether they were distinctions in target market focus between locally owned and international companies, an analysis was undertaken with this distinction.

The chart above shows that, whilst there are some differences. only two are economically significant. The first is that, for multinational companies, government is an even greater focus than for those companies which are Australian owned, and the second is that, for the majority of other markets, Australian owned firms have a higher level of concentration than multinationals

This suggests that multinational firms operating in Tasmania, whilst also targeting a broad range of industries, have a strong focus on the government market. It is also, perhaps, indicative of the "thin" nature of the Tasmanian market, where lack of market depth and a shortage of alternative clients, may preclude companies from having the luxury of selecting specific niche markets on which to concentrate their efforts.

What is also very clear is that, purely on the basis of market analysis, there appears to be little market synergy within the Tasmanian ICT industry that might indicate a dominant niche focus upon which critical mass for research and development and for market access, might be derived.

Focus Groups

As part of this study TASICT invited members representing different sectors of the industry to attend focus group workshops in Launceston, Devonport and Hobart.

Workshops in Northern Tasmania took place on the 24th (Launceston) and 25th (Devonport) September. Attendees represented Telecommunication, software development in different areas like photo development, e-learning, health, retail and banking. Other than one participant, all were SME's.

The Workshop in Hobart took place on the 26th September. Participants represented Telecommunication, GIS systems and Software development. Attendees included both SME's and larger players.

Key topics discussed in all focus groups were:

☐ Current state and role of the State Government to empower ICT business in Tasmania
☐ Enablers for supporting the Tasmanian ICT industry e.g. infrastructure, education, skills, work culture, employment cost, environment
☐ Keys to attract, keep and develop ICT businesses in Tasmania

The statements following are a collection of opinions expressed in reply to questions asked by the facilitators of the groups.

It should be noted that the comments are the unexpurgated views of individual Focus Group attendees, and do not, therefore, necessarily represent a consensus view of the attendees at the Focus groups or of the Tasmanian ICT Industry. Nor do they represent the view of TasICT.

1. **Focus group messages to the Government on how to make a positive impact on IT businesses**
☐ Gov. should enable more exposure to the global market and the local market including Government Departments
☐ The State Government doesn't have a good relationship with the industry
☐ Government should take a look outside the state to see how things are done
☐ Better infrastructure would bring better knowledge in and enable exchange of knowledge
☐ Government bureaucrat gave us feedback that the industry would have to "work more with forestry and manufacturing industry to grow in the state." This is a short-sighted and restrictive attitude.
☐ State Government needs to change the way ICT is viewed.
☐ We are optimistic, because the premier understands IT
☐ More Leadership by Government is needed
☐ Government should recognize that small companies can do better job in some cases than some large ones.
☐ There is a conflict within DED Hobart vs. Launceston: *(attendee mentioned as an example 2 projects had been approved by Launceston and had been vetoed by Hobart. As a result the company suffered.)*
☐ Government does too much alone without having internal expertise instead of outsourcing to agencies
☐ Investment into developing competition is often wasted as Tasmania is too small a market and there is too narrow a supplier base for this to work efficiently
☐ Some Opportunities in Health and Government are not exploited
☐ Tasmania is a small country – Gov should go for partnership instead of competition

2. Focus Group messages about critical enablers for success for the Tasmanian ICT industry

Infrastructure
- □ We must improve the broadband pipe to grow ICT industry in Tasmania
- □ Lot of talk about creating more competition in providing infrastructure, doesn't create value, money seems to be wasted
- □ Users want better outcome, however through closer relationship or partnerships "value for money" outcome counts
- □ Broadbent bandwidth and costs have to improve (same as in Melbourne and Sydney)
- □ Better infrastructure and Connectivity - exposure comes through that and it opens up the market
- □ Tasmania is regional Australia
- □ Costs for Commercial Broadband is double the price in Tasmania *(end-user opinion)* because there is less competition
- □ BASSLINK needs to be made more accessible i.e. lower cost

Education and Skills
- □ Universities need to heed call for right subjects in technical curriculum i.e. DOT net
- □ University numbers are low, no career pathway
- □ Project management needs to be taught, pm skills are needed
- □ No internship programs *(statement in Northern Tasmanian focus group)*
- □ E-learning in Australia lags behind the rest of the world. UK spent UKP 300 m installing interactive whiteboards in all government schools. Mexico also pro-active in this area.
- □ Relationship between academics and business doesn't work – the have different agendas
- □ Gov has to get aggressive about this – overcome funding issues
- □ Innovative population, being small means you cover more areas, develop more generalists, individuals have broader skill bases, It increases your thinking, people know more about other areas
- □ Tasmania's heart innovative, smaller and wider spread capabilities create generalists, because we can't afford to just be specialists. This increases lateral thinking and relationship facility.
- □ (Generalist knowledge) enables you to find technical solutions to business needs higher level of skills and quality (assumption> possibly more expensive)
- □ Graduates lacking in business skills and people skills, graduate expectations need to be brought into line with reality, Y-generation are yet to be controlled

Living and working conditions
- □ Better work/life balance
- □ Shorter Commuting time
- □ Stability because people want to live here
- □ in reality costs are lower, 20-30% lower than on the mainland (examples: Gov pay $800-$1000 a day, industry $1000-$1500 per day depending on the job)
- □ Many Companies are based in Tasmania but make their money in Victoria or elsewhere
- □ Costs in Tasmania lower (rental, wages), lower staff turnover
- □ Small Companies can keep IP longer
- □ Networking is very important in Tasmania: building Customer Relationships, small community. These qualities could be used when business grows.
- □ Telstra is major employer (80% of IT cohort) in Launceston

Professional expertise   (Vertical Areas of Excellence)
- □ GIS in Mining/ we have Exceptionally good spatial data
- □ Multi media like Arts, Cartoons, Filming
- □ Major houses have been acquired or merged – Tasmanian Companies may have a tendency to be bought once they reach a certain size
- □ E-learning is alive although not supported in Tasmania. No of suppliers shrunk by 50%. , can't compete with free software

3. Focus group messages regarding key issues to attract and retain ICT in and to Tasmania

Intelligent Island

- ☐ Intelligent Island hasn't worked
- ☐ Didn't have experience with II
- ☐ Results have yet to be seen, it's too early
- ☐ Not enough Industry Input, too many Committees
- ☐ Badly managed application process
- ☐ New Systems (in the II project) seem to have improved, projects seem to be more worthy
- ☐ CSIRO was not in the interest of this state
- ☐ Haven't seen benefits yet
- ☐ Funding was allocated to people who were clever in getting funding
- ☐ A bit like AUSIndustry
- ☐ Financial Support was too low compared to the potential industry outcome
- ☐ Intelligent Island incubator was a help – *(one company of an attendee is ½ owned by II)*

Research and Development

- ☐ The CSIRO ICT Centre is not helping local ICT.
- ☐ Relationships with academic institutions are great in theory, but difficult in practice.
- ☐ Industry and academics had different agendas,
- ☐ R&D needs aggressive targeted funding.
- ☐ Universities think they are the tail and not the dog; they need to understand their role in the supply chain.
- ☐ University R&D needs more interaction with the commercial sector.
- ☐ The scope for industry R & D theories company by company, we need expanding markets to justify the expenditure
- ☐ University ICT advisory councils don't work very well, one or two meetings a year is not interface.
- ☐ University ICT people sometimes move to industry, but it is almost never the other way; we need to explore opportunities for interpolation.
- ☐ I. T. research depends on the individuals, it's not systemic
- ☐ Don't bring the academics to the table, bring them to the workplace. Industry has to be more open to them too.
- ☐ Industry is crying out for skills - we can get people on the bus, but how do we get good people on the bus?
- ☐ Universities are not innovative
- ☐ Risk that outcome based funding for Universities limits creativity but interaction with Commercial sector is needed
- ☐ Make them know what the real world is all about
- ☐ In small businesses there is no place for R&D because of all the internal shaping and forming

(One attendee in the Northern Tasmanian focus group explained that World Wide Customer demand drive R&D and Innovation and that 30% of his business income is spent in this area)

- ☐ Overseas examples should be looked at
- ☐ Small business managers are rarely or not asked to be guest lecturers at Unis, more to fill in gaps or to help with recruitment

(None of the attendees in Hobart is currently on any advisory Council of Universities)

- ☐ Of so *(referring to advisory Councils)*, only few meetings, 2-3 a year, well conducted but not frequently enough
- ☐ Probably consulted with bigger businesses
- ☐ SME's have more Interactions with TAFE's
- ☐ Skills issues – getting good people is the problem, more exposure to practical experience needed

Focus Group - General statements/solutions/ arguments
□ Federal Government could facilitate with State Government to enable exposure to markets
□ Similar processes should be used as for the Telecom Equalisation Scheme
□ Setting up Investment Corporations to support start ups
□ Perceived need for a "contractor supply" company
□ We should focus on Companies that would relocate and try to keep them here
□ Acquiring Australian Companies by international Companies can have different results: IP could stay in Tasmania, Development could stay where it is or not *(no agreement between attendees)*
□ Isolation is not a barrier – business is export focussed
□ Lack of capital is the only major issue
□ Sector growth linked to growth in other markets and government, not a standalone industry
□ Small companies must be innovative to survive
□ Business can deliver to the world via Internet and Communication links
□ Local Market is not significant enough, therefore more focus on export
□ Rapid development is being off shored but design and QA remain local
□ Access to capital and issue, Venture capitalists are not interested because Companies are too small

Synopsis:

Despite the fact that participants represented different parts of the industry and were located in different parts of Tasmania, and had many individual concepts and concerns, some strong common messages could be identified:

The Tasmanian ICT industry seems to consist of mainly SME sized businesses with a strong focus on the mainland. Upon reaching a certain size ICT Companies seem to have a tendency to be merged or sold and as a result move key areas of their business interstate. If they stay in Tasmania, then, due to the limited local market, their main channel is export.

The current Government support for the ICT industry is perceived as strong in intent, but weaker in delivery, due to lack of knowledge and understanding. The Intelligent Island program is seen by some respondents to have missed its target; most of the focus group attendees didn't experience any advantage within their business. As reasons for these perceptions, some named complicated processes and too much bureaucracy as key concerns.
It was suggested that alternative investment models are needed to retain business in Tasmania, rather than the current perception that they are targeted just to support start ups.

Most Companies indicated that they suffer from infrastructure deficiencies like lack of broadband capacity and comparably higher broadband prices than on the mainland. They all believe that improvement in this area would be a strong enabler for business development and retention.

Almost all participants confirmed that they experience difficulties with matching their skill needs. They claimed that Universities and ICT industry do not co-operate well and that Graduates are not qualified in the areas needed, such as project management.

Higher work/ life balance, lower employment and living cost and a more generalized skill set were named as unique values for the Tasmanian ICT industry. Local ICT workers seem

to be perceived as being more creative, innovative and lateral thinking. These qualities and natural networking skills and relationship facility appear to be key success factors when expanding their businesses.

Tasmania is perceived as having lower living and employment cost than the rest of Australia.

Tasmania ICT is also perceived as having lower staff turnover.

## *Supplementary input on barriers to success*

Respondents to the ICT industry Survey identified a limited number of "barriers", with comments mainly correlating to the group below, with minor variations:

| |
|---|
| Government procurement in Tasmania limits the size and extent of work |
| Access to funding |
| Access to capital |
| Availability of experienced enterprise architects |
| sales & marketing skills |
| Lack of channel development capability |
| Access to external markets |

These can be broadly categorised as relating to the primary business growth constraint factors: market size and reach; capital; resources (staff and equipment); sales capacity, and are thus not specific to the ICT industry.

ICT Remuneration in Tasmania

A number of focus group respondents indicated a belief that wage costs were lower in Tasmania than on the mainland, and that Government contract rates were below the national norms. The data below is taken from the Australian Computer Society 2008 remuneration Survey report, analysed by APESMA, and provides some confirmation that these beliefs are well founded.

Comparative ICT remuneration by State
Source: ACS/APESMA 2008 remuneration Survey analysis
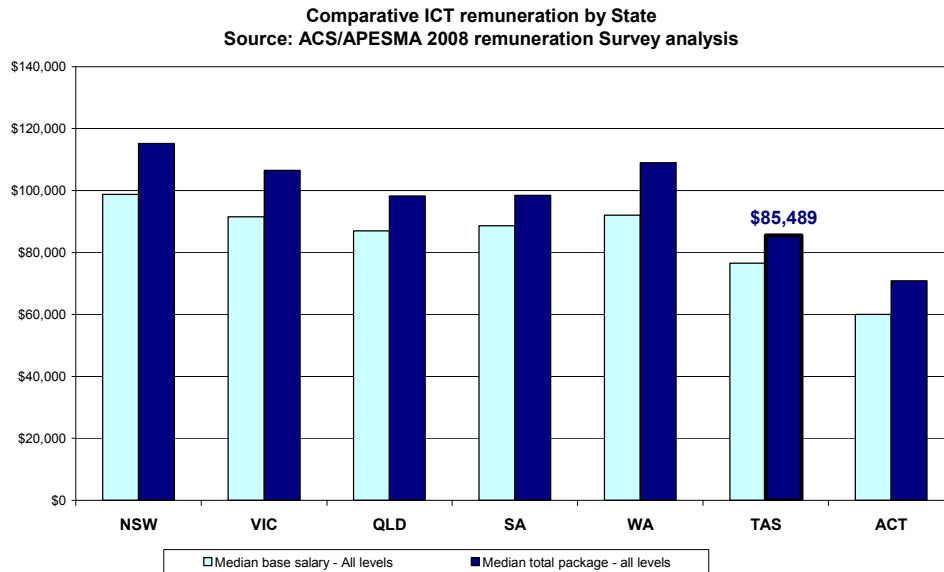

Across all salary levels and job-types in all industry sectors, the median Tasmanian ICT remuneration, both for base salaries and total packages, was below all States other than the ACT[9], where a large amount of low level data processing occurs.

Comparative private sector ICT remuneration by State
**Source: ACS/APESMA 2008 remuneration Survey analysis**

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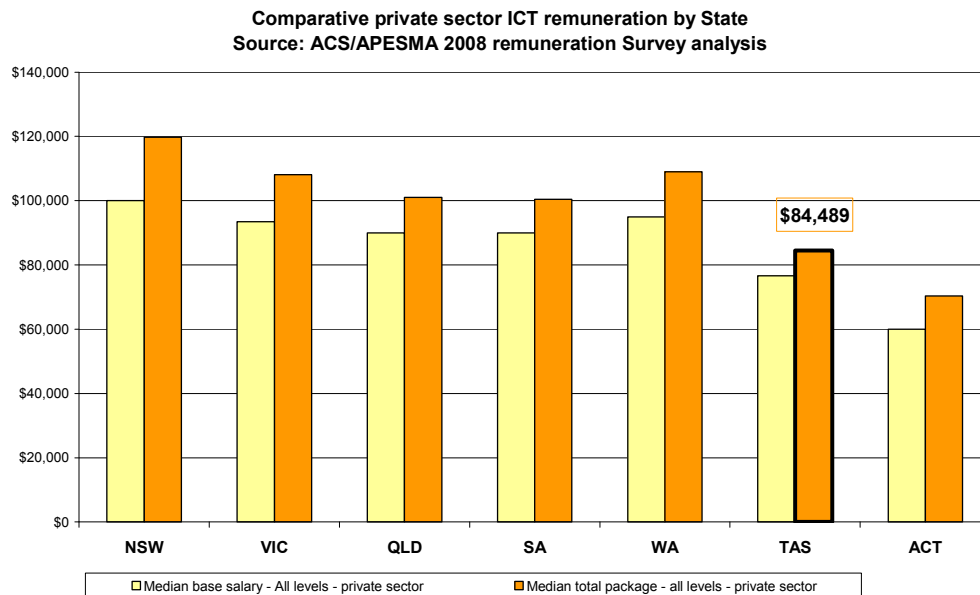
[9] NT data was too sparse to be indicative

A similar equation applies to a comparison restricted to the private sector, with an almost identical median total package and relative positioning for Tasmania.

Comparative public sector ICT remuneration by State
Source: ACS/APESMA 2008 remuneration Survey analysis
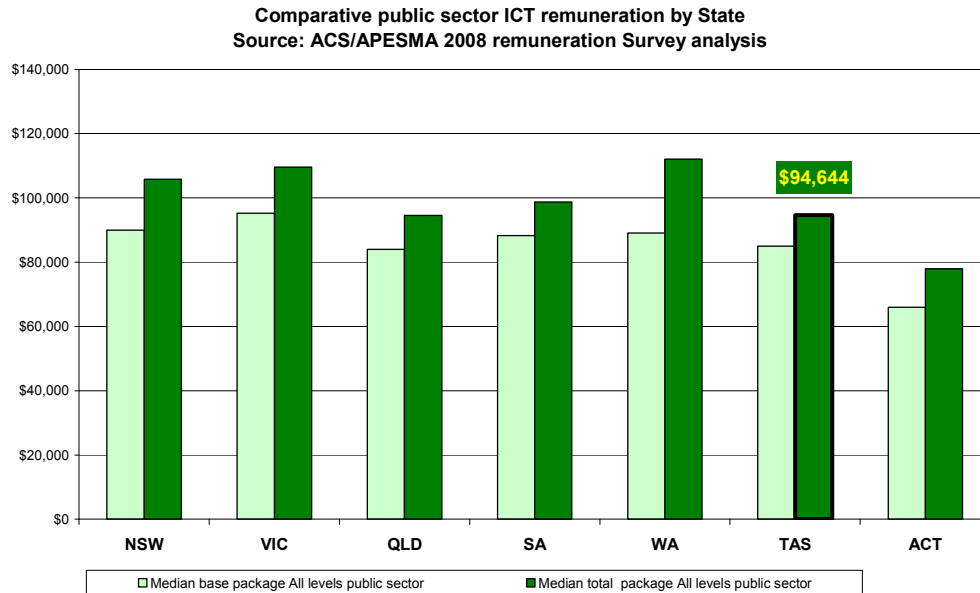
Public sector remuneration comparatives, however, have a narrower band of variation between the States, perhaps because public sector bandwidths are more widely published and understood. Tasmanian public sector ICT employees command similar returns to their colleagues in Queensland and South Australia, and the Tasmanian public sector median is higher than in the ACT.

Comparative public sector ICT remuneration by State
Source: ACS/APESMA 2008 remuneration Survey analysis
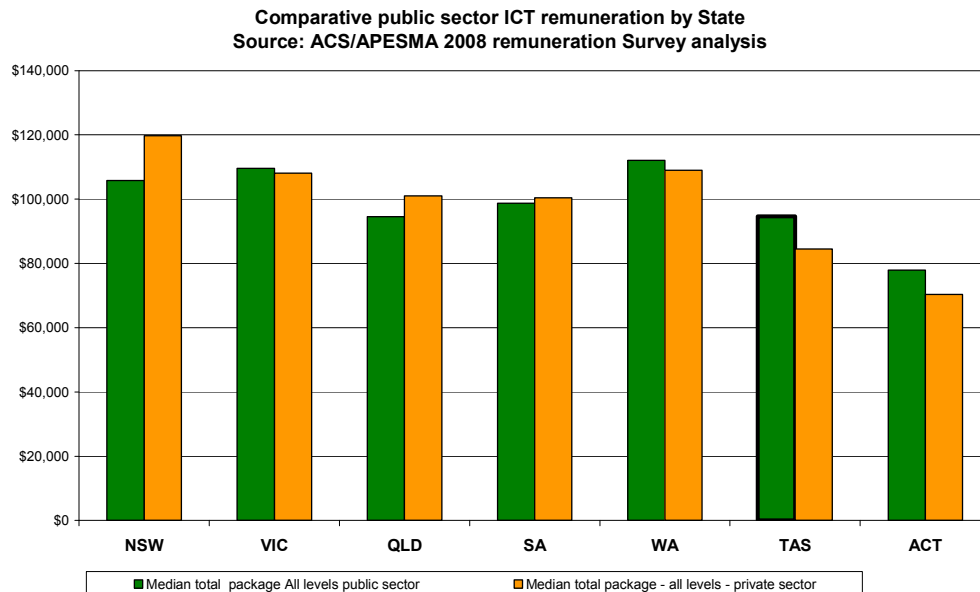
When public and private total package medians are compared, however, it is interesting to note that private sector medians are roughly equivalent to or higher than public sector

medians in most States with larger ICT industry sectors, whilst in Tasmania the opposite occurs.

This distinction supports the contention that ICT salary wage-rates being achieved in the public sector are not being matched by commensurate contract rates being paid to the Tasmanian ICT industry, reducing the ability of the Tasmanian ICT industry to pay nationally competitive wages.

Conclusion

The Tasmanian ICT industry is growing in its most important sector, software and services, but lacks synergy and critical mass in markets, research foci, and product/service areas.

Government support is perceived as being strong in intent, but delivery of Government support is perceived by some as of variable quality and relevance.

ICT infrastructure weaknesses, and, in particular, limited broadband access and relatively higher cost, retard Tasmanian ICT industry growth.

Tasmanian ICT companies require enhanced information exchange, lower ICT infrastructure costs and improved access, and improved research and market synergy.

TASICT can play a significant role in information exchange and in encouraging synergy at all levels.