

Investigating ICT Capacity

Laying the Foundations for ICT Strategy in the Hunter and Central Coast Regions

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This report is the summary report drawn from a much larger research report that was the final output of an 18-week project funded by the NSW Office of Information Technology & Management (OIT) in association with NSW Department of State and Regional Development (DSRD). The project has been administered through the Hunter Economic Development Corporation (HEDC) and the Central Coast Economic Development Board (CCEDB). The Centre for Regional Research & Innovation (CRRI) from the University of Western Sydney (UWS) was contracted to complete the work.

The project has been assisted by an advisory committee made up of the following members:

- Hunter Economic Development Corporation, Eddie Bernard/ Darren Turner.
- Central Coast Economic Development Board, Peter Brown.
- Connect.CentralCoast, David Abrahams.
- New South Wales Department of State and Regional Development, Alison Pepper
- HunterTech, Peter O'Malley.
- Office of Information Technology, Mark Nicholson.

The project was commissioned in order to obtain knowledge to help position the Hunter and Central Coast regions more competitively in the global economy. The study sought to determine the 'ICT (Information and Communications Technology) Capacity' of the Hunter and Central Coast regions and offer recommendations for future strategy development designed to enhance this capacity. The study addressed:

- Industry use of ICT hardware, software and infrastructure in the 2 regions
- The importance of ICT to the regions' economic bases
- The regions' competitive advantages, strengths and weaknesses
- The impediments to growth of ICT
- Key factors for ICT business relocation or service provision
- The issues that need to be tackled to ensure competitive advantage

The findings of the study will be used:

- To contribute to the development of an ICT strategy for the regions
- As a baseline to compare industry change and trends

- To market the regions' ICT goods and services and to promote and attract investment into the regions, resulting in job creation

Focus Questions

At the core of this study were 4 focus questions (FQ)

FQ.1 What is the state of existing knowledge of the ICT Capacity of the two regions?

- What are the current economic profiles of the two regions?
- What is the existing contribution of the ICT sector to the GDP of the two regions?
- What is the nature of ICT skills provision?
- How has previous research reported ICT usage?
- What are the key themes of existing published reports?

FQ.2 What are the key issues for users and producers of ICT in the two regions?

- How is ICT being used by local industry?
- What is the strength in demand for ICT services?
- What are the ICT skills needs of local industry?

- How do firms engage with local suppliers for ICT skills and services?

FQ.3 What are the relative strengths and weaknesses of the two regions with respect to ICT capacity?

- What is the nature of ICT skills provision?
- What is the nature of existing institutional networks?
- What are the regions' exploitable assets?
- What are the regions' emerging industry sectors?

FQ.4 What strategies are suitable to stimulate the ICT capacity in the two regions?

- Which strategies best address the ICT needs of existing industry?
- Which strategies will best attract new ICT firms to the regions?

Project Stages & Method

To address the focus questions of, this project has been conducted in 3 basic stages. Each of the stages involves different information gathering techniques. The relationship of the project stages, the focus questions, the information sources and the data gathering methods are illustrated in Figure 1.

- 1 An analysis of existing published material and statistical data
- 2 The gathering of primary evidence from respondents located within the two study regions
- 3 The analysis of data, the distillation of regional strengths and weaknesses and suggestion for future strategy and actions

The first part of the primary data collected was completed through a survey of a sample of firms from the two regions. This sample was split into a stratified random sample and a smaller targeted sample of ICT firms. An example of the questionnaire used is given in Appendix 1. The survey response rate after telephone follow-ups was 10.1%. This rate of return passes the level outlined by Gosling's (1992) for statistical validity and so provided a sound base for the second stage of primary data collection – interview and focus groups.

The interview/ focus group sample list was a group of key regional business or government representatives who were judged to be aware of regional issues and the ICT industry generally, this was derived from stakeholder suggestions. The list of key contacts used in this research and their associated fieldwork codes are given in Figure 2.

Interview data was used to provide the bulk of the *qualitative* material – using the information gained from the industry survey as a baseline from which to explore *deeper* information. Thus, the interview/ focus group discussions in the regions were used to (i) validate the results of the survey and (ii) stimulate the generation of key themes and strategy.

The entire research project was conducted as an iterative process with constant and open communications between the CRRRI research team and the project steering committee.

The full report on the project includes 6 sections. As well as an executive summary it includes a review of existing strategy documents and published data (sections 2 and 3), an overview of the methods used in conducting this project (section 4), the results of the analysis of the Stage 2 data collection (section 5), and finally, a discussion of key themes and strategy recommendations (section 6). In this shorter summary document, the key findings of the full report have been distilled into 4 sections. Together with this section (Introduction), these focus on the 3 broad project stages – stage 1 (literature and data review), stage 2 (primary data analysis and results) and stage 3 (issues and recommendations).

Figure 1 Project Stages, Focus Questions and Information Sources

Stage	Focus Question	Information Source	Data Gathering Method
1	FQ1	Secondary sources	Desk research
2	FQ2, FQ3	Primary data sources	One-to-one interviews, focus groups, telephone interviews and e-mail contact.
3	FQ4	Primary data sources	Desk research, in consultation with key industry contacts

Figure 2 Organisational Spread of Contacts Supplied by Stakeholders and Included in Fieldwork

Study Region	Fieldwork Data Code	Contact
Hunter	H1	Hunter-based regional health authority
	H2	Medium-sized electrical and electronic design and manufacturing company
	H3	Multi-national mining organisation
	H4	Medium-sized computer systems consultants
	H5	Small infrastructure provider/ systems provider
	H6	Local authority
	H7	Local authority
	H8	University
Central Coast	CC1	Multi-national systems designer/ provider
	CC2	Local internet service provider
	CC3	Multi-national computer software design firm
	CC4	Local ICT network organisation
	CC5	Small on-line/ ICT enabled education firm
	CC6	University
	CC7	Business incubator
	CC8	Computer management systems (CAE) firm
Hunter & Central Coast	FG (focus group)	Medium-sized software developer Local authority Small manufacturing firm NSW Govt department Education Agency Regional development agency Small web-design & development firm Medium-sized manufacturing firm Regional education network

Both the Hunter and the Central Coast regions have a range of existing strategy documents related to ICT specifically and regional economic development more widely. The starting point of the project was to examine this existing published material. Similarly, the data review section of this report has collated and analysed an exhaustive range of information available at the time of the initial stages of the project. Every endeavour was made to search for and report on information that could be used to inform both the research team and the project steering committee about the current state of ICT in the two study regions. Existing data covered a range of topics such as business use of ICT, ICT infrastructure, the general economic landscape and ICT skills provision (among other topics). Occasionally, where existing data was inadequate, the research team derived estimates, or conducted modelling to add value and validity

Thus, the literature and data review components that comprised the early stages of the project set the context for the remainder of the study. It is clear that both regions have recognised the potential of ICT for economic development not just as a valuable industry sector, but also as a key driver of regional development.

Contribution of ICT to the Economy

As a starting point for the study, the research team estimated the current contribution of the ICT sector to the regional economy in terms of Gross Regional Product (GRP). The research team used ABS data from recent 'Input-Output Tables' in way that would enable the 'benchmarking' of regional ICT capacity. The complete method is given in the full research report.

The contribution of the ICT sector to the regional economies studies is shown in Figure 3

Across Australia an estimated 6.58% of Gross Domestic Product (GDP) was *directly* related to output from the ICT sector. Analysis at a regional level for the Hunter and Central Coast indicates that ICT activity contributes approximately 4.98% of the region's Gross Regional Product (GRP). Of the two separate regions, the Central Coast's ICT contributed the higher proportion to GRP, with 5.99% of all output from the Central Coast being ICT related. 4.42% of Hunter GRP was estimated to be from ICT.

Figure 3 Proportion of GDP Directly Related to ICT

	Total GDP**	GDP derived solely from ICT	% of GDP derived from ICT
Hunter	\$16,634,790,407	\$734,829,616	4.42%
Central Coast	\$6,605,907,940	\$395,734,156	5.99%
Hunter & Central Coast	\$22,692,887,358	\$1,130,263,818	4.98%
Total Australia	\$504,747,424,570	\$33,191,785,740	6.58%

** all dollar values are in 1997-98 prices.

Figure 4 Gross Regional Product (GRP) Derived from ICT – Split Within ICT Sector for the Hunter and Central Coast Regions

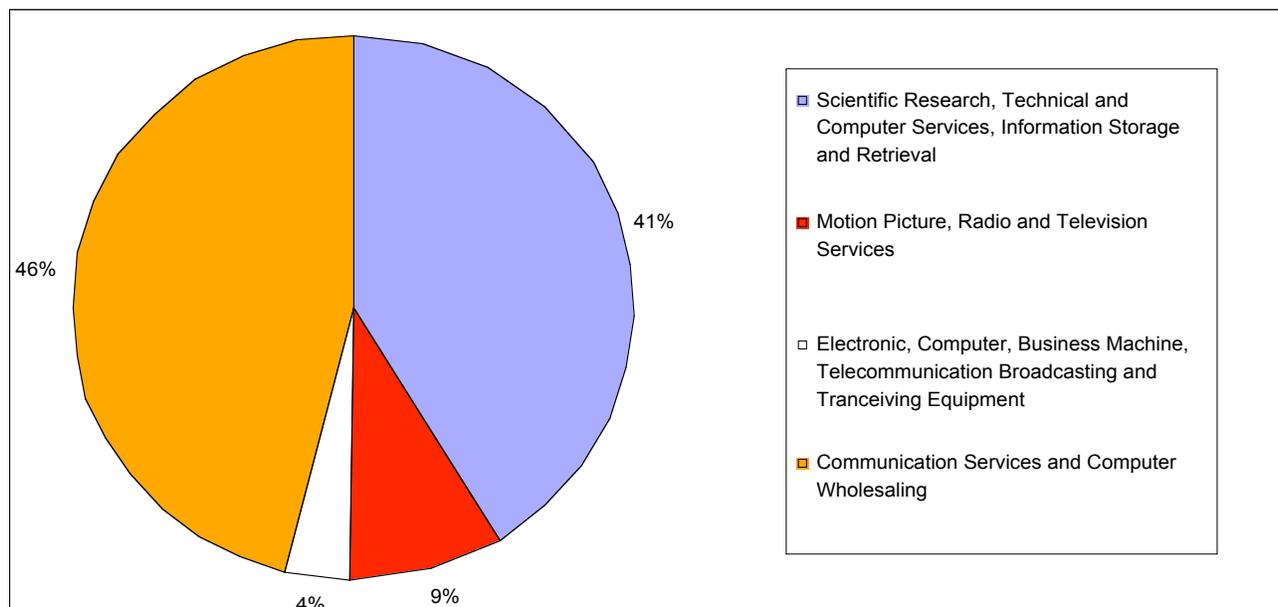


Figure 4 provides an estimate of the sub-sectors of the Hunter and Central Coast’s ICT sector that contribute the most to total economic activity of the regions.

One result from this type of procedure will be that it significantly underestimates the total contribution ICT has on the region’s economy. This is due to the fact that most businesses would be expected to be using some form of ICT as a value added producing tool in day-to-

day business, however, the above method includes only industries that rely solely on ICT for their core business income.

Given these considerations, it is reasonable to conclude that a wider range of industries use ICT to produce value added and hence are currently contributing to the region’s ability to create wealth and provide income. However, while detailed data of the proportions of business income derived from ICT remains

unavailable, more reliable estimations of the contribution of ICT to the economy could be gained through further research. As it stands, the figures for GRP derived from ICT are most useful as a ‘benchmark’ figure of ICT capacity – capable of being rolled forward to provide a picture of regional change.

Key Themes in Existing Literature

Skills and Training

In the Central Coast, much of the existing published material emphasises the existence of a ‘highly qualified IT workforce’ that commutes to the Sydney CBD to work. The use of one of the Central Coast’s key resources (its workforce) as a means to create value for the Sydney CBD, has long been recognised by the regional development agencies in the region. This situation would appear to offer the Central Coast the opportunity to capture more of this skilled workforce. It would seem likely that many workers might prefer to undertake some or all of their work *within* the region (CCEDB, 2000). This offers a bank of skilled workers to drive local business if business and jobs could be created to support them.

ICT Infrastructure

One of the core issues in the attraction of ICT firms to both the Hunter and Central Coast

regions is the availability of high quality telecommunications infrastructure. The telecommunications providers insist that the highest quality telecommunications infrastructure is available to *all* of regional Australia including the two study regions. Nevertheless, both regions have telecommunications improvements listed high on their regional development priority lists. The reason for this apparent contradiction is the fact that while the supply of high-quality telecommunications infrastructure is invariably possible for a given area or business, the *costs* associated with access away from centres of population are often prohibitive. This obviously impacts on investment decisions of firms looking to re-locate to such areas. Perhaps more importantly, it is also thought to effect the establishment of small ISPs (Internet Service Providers), who would be able to provide lower cost business (and public) access to the internet. While there are existing reports and some existing data on both regions in relation to ICT infrastructure, the unwillingness of companies to disclose information on their networks means that it is unclear exactly where the areas of high quality existing infrastructure are located and how this corresponds to centres of business activity.

Demand for ICT & Infrastructure

Of course, any discussion of the *supply* of telecommunications infrastructure must also consider the *demand* side. Our review of existing documentation showed that while there was some available data for the Hunter on business use of ICT and access to the internet (HVRF, 2001) and also some for the Central Coast related to general attitudes to IT and the Internet (CCEDB, 1999), there were still substantial holes in the understanding of the precise nature of business use of ICT and need for other ICT services. To address this, the project sought to gather additional information on ICT use in industry, including:

- Type of ICT equipment used
- Number of computers
- ICT applications used (e.g email, word processing)
 - purpose
 - frequency of use
- Number of ICT staff
- ICT expenditure
 - acquisition
 - internal costs
 - software licensing
 - training
 - systems development
 - maintenance
 - external services

- Source of ICT purchases (geographical)

Another key issue for the regions is the availability of training and education systems based on ICT. Much writing on the ‘knowledge economy’ points to a rising status for knowledge and information as key resources in our economy. Perhaps more than ever, the prevalence of appropriate skills and knowledge in the workforce is of central importance for economic development. Reports have pointed to a widening skills gap between Sydney and the regions (ABF, 2001). This appears to be supported by evidence from the Hunter which reports that between 1995 and 1998 19% of workplaces experienced skills shortages (HVRF, 1995 and 1998). However, the available literature gives no details concerning the precise nature of skills that businesses value on the one hand, and the skills and training that are offered by the various institutions on the other. As a result, our research set out to gather more information on:

- Number of staff with IT skills (in different firms)
 - specific skills
 - education level
- Perceived skills shortages
- Available training courses

Networks

In approaching the economic development of the regions, key industry players in both the Hunter and the Central Coast have stressed the value of adopting a co-operative 'networked approach'. In both regions there are a large number of organisations with some interest in (or responsibility for) economic development. While a number of key regional leaders and agencies can add considerable value as part of the institutional fabric of the region, it is important that each region understand the distinct roles and responsibilities of all involved. In particular it is imperative that the business support environment is properly understood.

The data obtained from the industry survey and subsequent rounds of face-to-face interviews, focus groups, telephone interviews and e-mail contact with firms, and key contacts in the two study regions was analysed by the CRRI team. As a result of our analysis, a number of key issues were identified.

ICT Skills and Training

Both regions have high numbers of firms employing staff with ICT skills and conform closely to the average for Sydney (17%). Figures for the Central Coast at 17.3% are slightly higher than the Hunter at 16.7%.

The TAFE is the most used provider of ICT skills – providing 39% of ICT skills in the Central Coast compared with 54% in the Hunter.

The most prevalent ICT skills of staff in the firms responding to the survey were the most basic of ICT applications – basic office and administration functions (see Figure 5). Firms in the Hunter displayed a slightly higher propensity to use more advanced ICT applications. This is perhaps an indication of a greater level of ‘maturity’ in the use of ICT by business in the Hunter.

Figure 5 Percentage split of application specific ICT skills in Hunter and Central Coast Firms

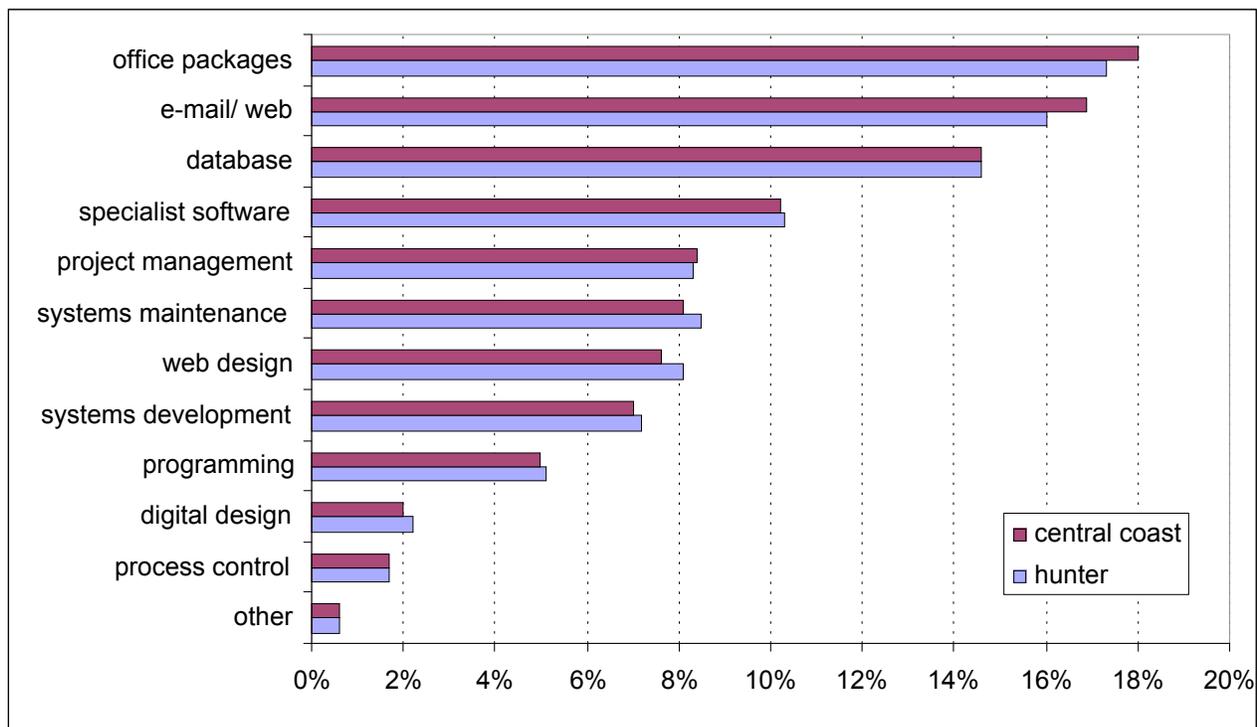
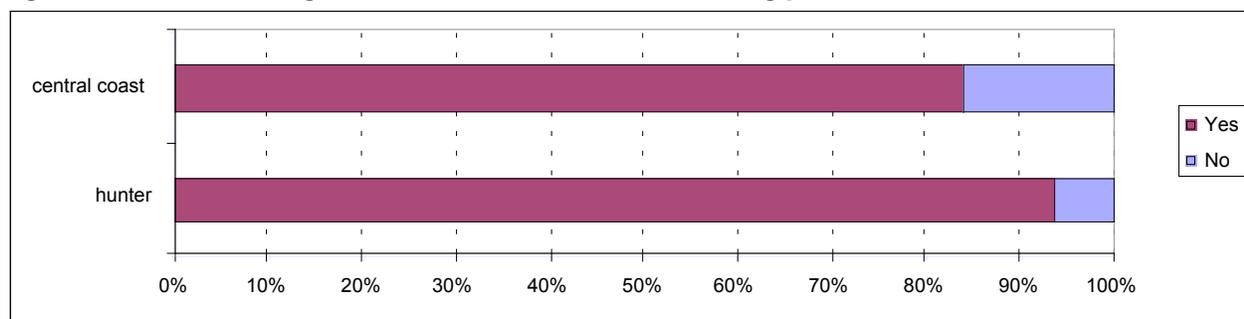


Figure 6 Percentage of firms satisfied with local training providers

Most firms contacted were happy with the output of local training providers and both regions recorded high levels of satisfaction – 84% in the Central Coast and 93% in the Hunter (see Figure 6). However, some concern was expressed during the fieldwork in the Hunter over the dominance of ‘technical’ over higher order ‘analytical’ ICT and business development skills. Some interview respondents linked this dominance of ‘technical’ skills to the heavy industrial heritage of Newcastle within the Hunter region. This perceived skills gap is now being addressed through the planned Bachelor in IT course at Newcastle University.

Business Use of ICT

Firms in both areas display high levels of ICT adoption – both in terms of business use of ICT (Hunter – 82.5% and Central Coast – 81.2%) and access to the internet (Hunter 79.1% and Central Coast 72.4%). This is shown in Figures 7 and 8. However, the application of ICT in

business is dominated by the most basic ICT applications (see Figures 9 and 10). This corresponds with the data for ICT skills in the regions (Figure 5)

Website usage is dominated by information dissemination/ retrieval and advertising (79%). However, of those firms with an Internet connection, there is a significant proportion using B2B¹ (Hunter – 20%, Central Coast – 20%) and B2C² (Hunter – 31%, Central Coast – 22%) transactions (see Figure 11). However, there are high levels of dissatisfaction with access to the Internet (Hunter 22%, Central Coast – 31%) and telecommunications supply more generally in both regions. Indeed, many interview respondents suggested that this was the single most significant weakness of business location in the Hunter and Central Coast.

¹ B2B – business to business

² B2C – business to customer

Figure 7 Comparing the % of firms in the Hunter and Central Coast using ICT as part of their business

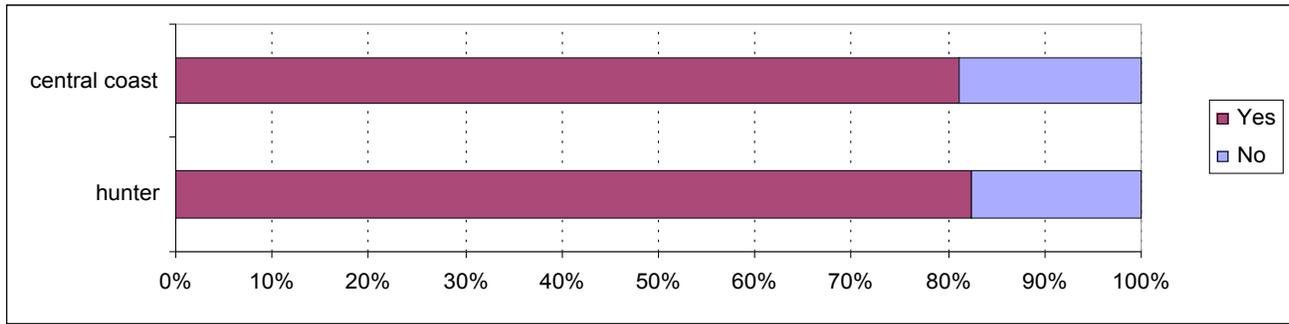


Figure 8 Comparing % of firms with internet access in the Hunter and Central Coast

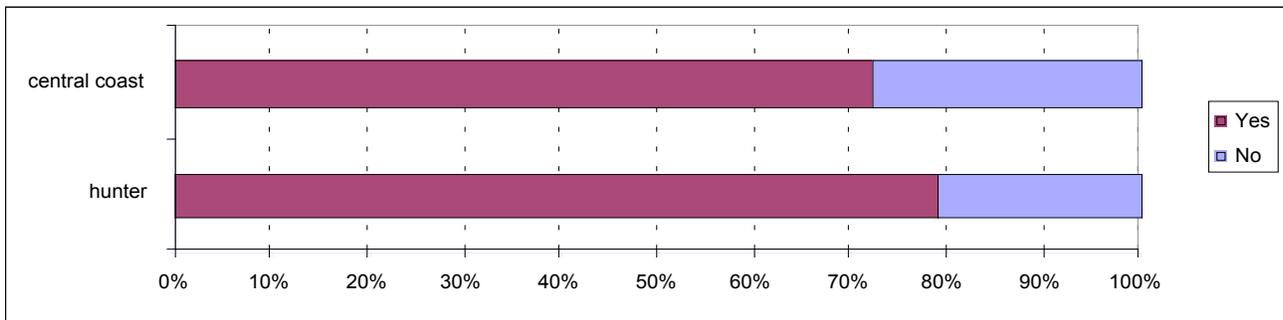


Figure 9 Numbers of firms in the Hunter Using various ICT applications in their business

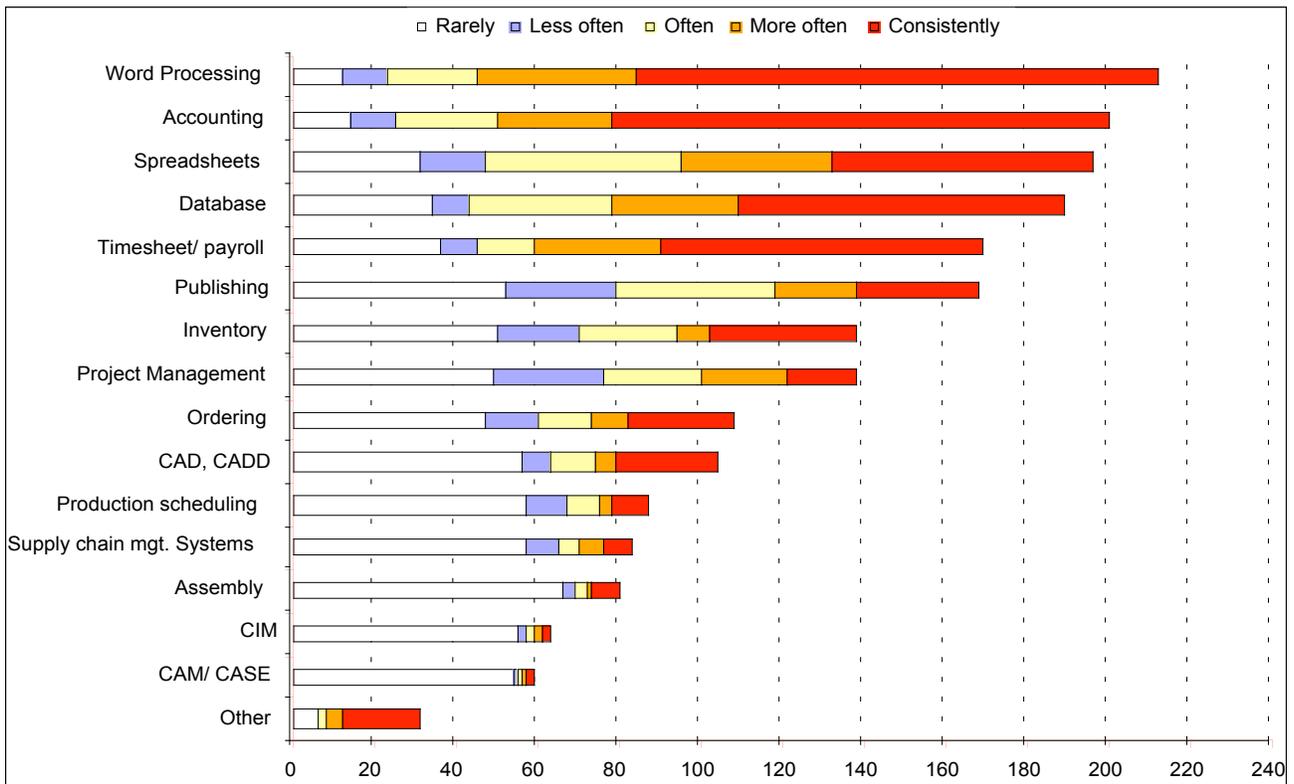
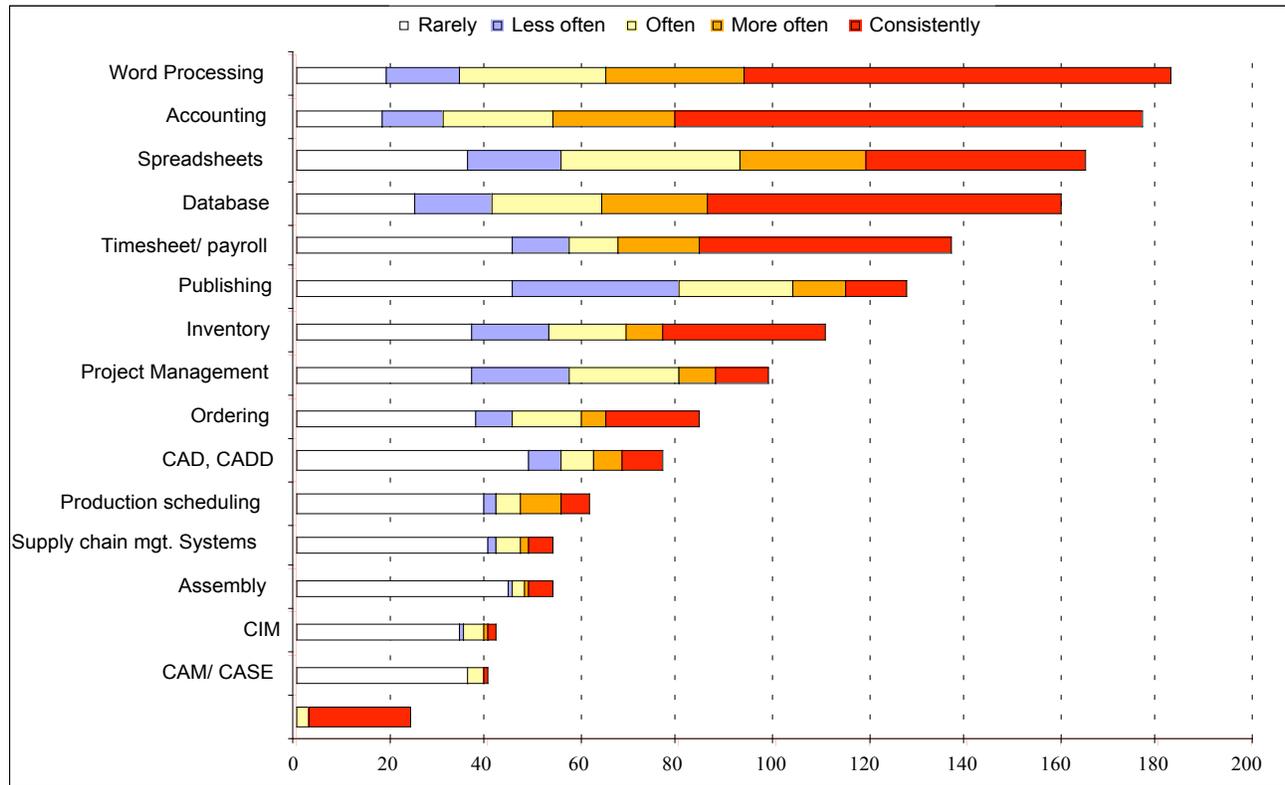


Figure 10 Numbers of firms in the Central Coast Using various ICT applications in their business



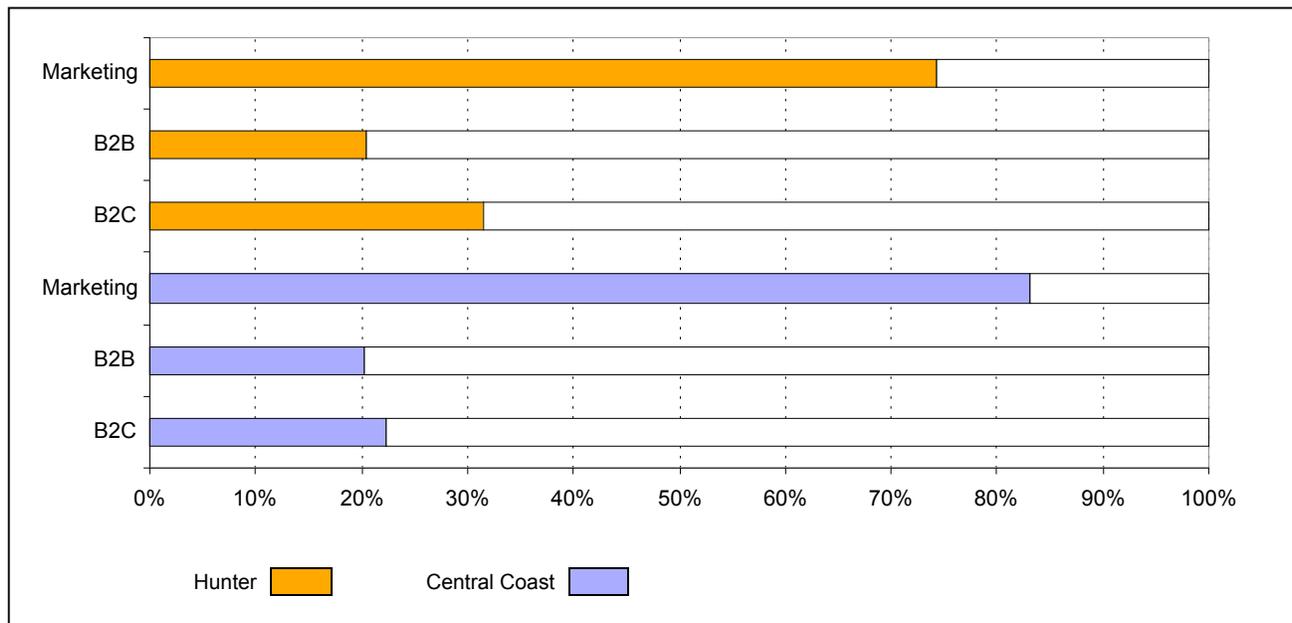
Expenditure on ICT is concentrated on acquisition, software licensing and maintenance, with the smallest expenditure on systems development, external services and training. This pattern is repeated for both the Hunter and the Central Coast.

Networks and Interaction

The Central Coast displays a higher level of ‘connectedness’ with Sydney in terms of business interaction with suppliers and business partners. This comes as little surprise with the Central Coast being geographically closer to Sydney. Network membership is

much higher in the Hunter at 46.9% compared with 33% in the Central Coast.

These figures might suggest a stronger internal network within the Hunter - perhaps in direct relation to weaker links with Sydney. However, it is more likely that this is simply a reflection of HunterTech – the Hunter’s key industry network organisation being better established than its equivalent in the Central Coast – the ‘Connect’ group. Despite the high proportion of network membership, many firms reported disappointment at the lack of co-ordination between the various bodies responsible for economic development.

Figure 11 Comparing the use of business websites in the Hunter and Central Coast

Future Plans

In terms of future development, most of the firms that indicated plans to expand their use of ICT were interested in website development (Hunter – 20%, Central Coast – 20%) followed by software (Hunter – 19%, Central Coast – 18%) and then hardware (Hunter - 18%, Central Coast – 16%). Relatively few firms in either region were interested in expanding their use of an on-line catalogue (Hunter - 5%, Central Coast – 9%) or on-line sales (7% - both regions). However, we must remember here that firms in both regions displayed relatively high current access to the internet (Hunter- 79.1% and Central Coast-72.4%). Of firms that have their own websites, 20% use them for B2B

transactions and 22% for B2C transactions in the Central Coast. In the Hunter, 20% use websites for B2B transactions and 31% for B2C transactions.

There are significant numbers of firms in both regions who feel that access to suitable/trained staff is a key barrier. Indeed, for the Central Coast this is the most frequent response. This contrasts with the widely held notion that skilled ICT staff is the Central Coasts key strength. This suggests that there may be some resistance from local ICT workers who commute daily to Sydney actually working locally. This requires further investigation.

After analysing the data received from the industry survey and subsequent rounds of interviews and focus group discussions, key themes emerged for the development of ICT Capacity for the 2 regions.

Once these key themes had been identified, they were worked into recommendations for future strategy and action in consultation with key regional informants.

The Hunter Region

Our research found that there are 5 key issues underpinning the ICT capacity and potential of the Hunter region:

- Quality of lifestyle
- Quality of, and access to ICT infrastructure
- Distinctive regional business culture
- Existence of University, TAFE and other training providers
- The existence of a wide range of effective regional economic development bodies

The most common key strength cited by Hunter informants was ‘lifestyle’ in both social (high quality natural environment) and economic terms (low house prices) (fieldwork data: H1, H2, H5, H6, H7). As a location for business, the region can offer low rents and relatively

good connectivity with key markets. While there are signs that the trend is changing, the region continues to be perceived as a ‘remote’ business location by firms located in Sydney CBD (HVRF, 2002). Transport infrastructure to link Newcastle with Sydney is quite good with the F3 freeway extensions over the last few years facilitating opportunities for business between Hunter and Sydney (National Economics, 2001). There are good air links between Newcastle, Brisbane and Sydney but poor availability of landing slots at Kingsford Smith Airport at peak business times continues to give cause for concern (ibid). Strategies to increase the capacity of Newcastle airport identified in previous reports (HRDO, 2000, HVRF, 2002) will go some way to reducing this perception of ‘disconnectedness’.

The issue of ‘connectedness’ is often tied to discussions on telecommunications infrastructure and this is a key issue for the building of ICT Capacity. In this respect, Newcastle CBD has the distinct advantage of having an established broadband loop in the CBD provided by Ipera Communications and a proposed broadband service for Lake Macquarie and Newcastle by Sasktel. There are other infrastructure opportunities here, State Rail are installing a fibre optic network along the rail

corridors of the Hunter Valley, while this is primarily for the purposes of linking rail signalling networks, the infrastructure is currently under-utilised (HEDC, 1999)

Despite these significant developments, infrastructure in more sparsely populated parts of the region continues to be perceived as inadequate by many firms (fieldwork data: H1, H4, H5, H6, H7). The debate surrounding the provision of telecommunications infrastructure is a familiar one – suppliers will supply first to areas that have the ability to pay for services and the demonstrable strength of demand. For those parts of the Hunter that lie outside the CBD there simply is not the density of businesses with a need for high bandwidth infrastructure to encourage the telecommunications suppliers to invest in the supply of high quality infrastructure. Of course, this does not mean that high quality telecommunications infrastructure is not available in these areas. Broadband infrastructure is available, it is just priced beyond the reach of most firms (fieldwork data: H2, H4).

For some parts of the Hunter, there is hope in the establishment of ‘Community Technology Centres’ (CTCs). The Hunter region has 8

CTCs (Port Stephens, Scone, Merriwa, Singleton, Gloucester, Dungog, Murrurundi and, Bulahdelah). These community centres offer the potential for groups and businesses to have access to ICT and high quality infrastructure. Many of these CTCs are associated with community ISPs. The fact that these exist is important for more remote areas as ‘Internet services’ are not covered by any universal service obligations. However, as a catalyst for ICT industry development their potential is limited without the addition of development programmes.

A further issue for the region is the lack of co-ordinated infrastructure planning. The difficulty of infrastructure forward planning is exacerbated by an acute lack of knowledge of the areas of industrial agglomeration within the Hunter region among key regional economic development organisations. Knowledge on the location of groups of firms is important because clusters of firms that need high quality infrastructure would stand a much better chance of securing supply at a reasonable cost than a single firm. While Newcastle City Council has admitted to having limited information on the location of industry sectors within the region, it has speculated that there are no well-developed ‘industrial districts’ in the Hunter.

The regional development literature has shown that regions that can demonstrate an ability to develop linkages, clusters and interaction are more likely to produce innovative firms and develop ICT industry. Though lacking any well developed physical clusters of industry, the Hunter has a virtual cluster of IT firms in the form of the HunterTech consortium. HunterTech offers more than a regional forum for its members by offering the opportunity for business partnership on projects and as such, its operation is a significant strength for the region.

The existence of strong training providers in the region is a further strength. ICT is a knowledge intensive industry. Newcastle University and the TAFE are producing high quality graduates who are generally received well by industry. Industry survey data gained from this project show that most informants were generally happy with the provision of IT skills from local education and training establishments. However, there was some concern that the 'business culture' of the region was adversely affecting the output of education and training institutions (fieldwork data: H2, H4). While the region has a good source of the technical IT skills, some of our informants suggested that it lacks the 'higher order' analytical skills necessary for developments in high technology

industry (fieldwork data: H2, H4). This lack of higher order focus is now being addressed by Newcastle University with the development of a new Bachelor of IT course.

There are a number of business culture issues that also need to be addressed if the region is to reach its full potential. Many informants reported that Hunter business has a 'small town' mentality (fieldwork data: H4, H2, H1). In some respects this might be considered a regional strength in that there is perceived to be a much greater level of 'openness' amongst business as a result of less intense competition between firms than is experienced in Sydney CBD (fieldwork data: H1, H5, H7). This notion is supported by frequently reported anecdotal evidence of business being done on 'trust' (fieldwork data: H2, H5). However, many informants also allude to a 'Hunter knows best' attitude amongst firms (fieldwork data: H1, H2, H3). This attitude will seriously inhibit the ability of firms to take on more advanced ICT applications in their business. Conversely, through the fieldwork interviews, some informants suggested that the 'closeness' of Newcastle businesses actually results in greater levels of mistrust amongst business, with local firms often being wary of collaborating with other local firms in areas that are central to the

operation of the business for fear of critical information being leaked (fieldwork data: H2, H4). Such attitudes are a barrier to business partnerships that are such an important feature of innovative regions throughout the world.

While the project never set out to develop *detailed* strategy or action plans for the regions, after documenting the key emergent themes

from the research, several broad suggestions were made for future strategy and action. A summary of these suggestions can be seen in Figure 12.

Figure 12 Summary of Suggested Strategies and Actions for the Hunter

Region	Strategy/ Action	Comment	
Hunter	H1	Promotion of Public Sector Activity as 'Demonstrators'	The Hunter Health e-procurement and electronic patient administration projects should be presented as 'flagship' examples and used as vehicles to demonstrate the potential of the more advanced use of ICT in business and specifically the potential of e-commerce. Care should be taken to encourage the use of local sources for ICT inputs.
	H2	Identification and Stimulation of Industry Clusters	Efforts should be made by Local Councils with co-ordination from HROC and DSRD to identify existing industry clusters in the region. Action should be taken by DSRD in association with industry groups (such as HunterTech) to promote the development of industry clusters. A CBD-based business incubator should form part of this work.
	H3	Promotion of Emerging Smart Industry	Emerging 'Smart-Industry' sectors should be identified and promoted.
	H4	Telecommunications Infrastructure Improvement	Improvement to telecommunications supply should be sought from action on both the supply (lobbying of providers, promotion of local ISPs) and demand sides (awareness raising and demand stimulation)
	H5	Commercialisation of the HPC Node	The commercial opportunities of the HPC Node should be exploited. HEDC should be represented on the Newcastle HPC Node Management Committee.
	H6	Improved Co-ordination of the Regional Actor Network	There is scope for more collaboration and co-ordination between the various regional development bodies.

The Central Coast Region

Through the completion of this project, the research team has identified 5 key issues for the building of ICT capacity in the Central Coast

- The location of the *Central Coast*
- Large numbers of skilled ICT workers
- Large numbers of commuting workers
- The existence of active regional ICT networks
- Access to high quality telecommunications infrastructure

One of the Central Coast's key reported strengths is its location – halfway between Sydney to the south and Newcastle to the north (fieldwork data: CC1, CC2, CC4, CC5). In this sense there is considerable opportunity for the Central Coast to operate as a satellite for both cities. Closely following 'location' on the list of reported strengths from respondents in this research was 'lifestyle' (fieldwork data: CC1, CC3, CC7). The Central Coast boasts an excellent natural environment, coupled with relatively low land and property costs. The combination of these two factors has led to the Central Coast having a very large commuting workforce. Indeed, recent estimates suggest that between 40,000 and 60,000 people commute from the Central Coast to Sydney CBD each day

(Connect.CentralCoast.Org, 2002). A large proportion of this commuting workforce (9,000 workers) is thought to be made up of skilled IT commuters (ibid). This skilled IT workforce is a valuable potential resource for the region that currently creates value in the Sydney CBD. There is evidence from the fieldwork that many of these workers would be happy to trade the higher salaries and perceived higher career prospects of work in Sydney CBD for time saved in commuting and other lifestyle benefits if they could find suitable work in the Central Coast. Indeed, there was much evidence that ICT positions advertised in the Central Coast attract a very high number of locally-based applicants. Further to this, there is case study evidence from firms that IT staff recruited from the Central Coast to work in the Central Coast are more likely to stay in the post longer – i.e. there is evidence that firms in the Central Coast display much lower ICT staff churn rates than their Sydney counterparts. There is substantial anecdotal evidence here from firms such as Sterland Computing, Future School, Krone, Precision Data Systems and Tibco to support this assertion. If substantiated, this is a very important strength. The associated costs of recruitment and training for staff replacement are considerable – especially for ICT firms where staff churn rates are notoriously high.

The Central Coast's position as a Sydney satellite is likely to be significantly enhanced if the proposed Sydney to Gosford fast ferry route is established. However, there is currently very little empirical evidence on the nature of the ICT skilled workforce in the Central Coast and the nature of ICT commuter patterns (fieldwork data: CC1, CC3, CC4)

The Central Coast has the distinct strength of having an existing regional ICT network in the form of Connect.CentralCoast.Org. Operating broadly as a forum for discussion and an 'agitator' for members' ICT concerns with other agencies, the network takes its position at the hub of ICT industry in the Coast. Connect.IT is a spin-off organisation that is directly involved in the marketing of the ICT capacity of the Central Coast. Despite the substantial economic development activity undertaken by the Connect group, members give their time voluntarily. This activity takes its place alongside the work of economic development professionals from agencies such as DSRD. Economic development activity in the Central Coast and especially that which relates to the building of ICT Capacity is well co-ordinated and fairly well advanced. DSRD recognises the important role of education and training as the foundation of a knowledge economy and has been involved in building a strong relationship between the

Ourimbah campus of Newcastle University and local business.

Until recently the Central Coast had two economic development organisations – one stemming from state government (Economic Development Board) and the other from local government (Regional Development Corporation). The newly merged organisation (Economic Development Organisation) now has the opportunity to consolidate ICT related economic development activity.

The Central Coast has 3 major telecommunications providers with backbone infrastructure running along the Eastern boundary toward Brisbane. Yet access to broadband telecommunications within the Central Coast is still perceived to be poor. In terms of the services available, the region has a range similar to those offered in Sydney, particularly in regards to broadband services (eg. xDSL services). However there are still some availability restrictions in outer lying areas of the Central Coast based on geographical distance from major exchanges. This is particularly true for broadband services. There is also little public accessible, metropolitan-style fibre infrastructure comparable to many suburban areas of Sydney. Depending on the proposed method of ICT delivery, this could

limit public and small business access to only major areas that are in relatively close proximity to existing exchanges. Most larger businesses tend to be clustered together in major areas where access to such services are more readily available. Where such services *are* readily available, the limiting factor to utilisation is the associated *cost*. This is due to lack of choice of services from competing service providers. Telstra is the only major provider of actual infrastructure on the Central Coast, and there is little in the way of Points of Presence (POP's) provided by other competing carriers. Whilst telecommunication services can certainly be purchased from other providers (HunterLink, TerrigalNet), these providers are largely just wholesaling existing Telstra infrastructure at a small discount. To utilise existing alternative vendor infrastructure normally requires the establishment of a long haul circuit over local Telstra infrastructure back to the alternate provider's POP in Sydney. Thus the scope to lower telecommunications cost by the use of alternative carriers is diminished. For the above reasons delivery of ICT over broadband telecommunications within the Central Coast region would generally be more expensive than capital city and indeed availability may be restricted or not available at all to users and business in outlying areas. For businesses, choosing to operate in the Central Coast, these

costs must be balanced against other key *benefits* of the region.

An additional problem faced by the Central Coast appears to relate to the geographical classification of the region by Telstra – with part falling within Sydney ‘metropolitan area’ and the remainder falling in ‘Country-Wide’ area. Interview respondents suggested that this has resulted in the Central Coast lacking a dedicated focus from Telstra staff. Many firms contacted through fieldwork interviews reported poor experiences in dealing with Telstra with ‘long delays’ and ‘poor service’ being the common complaints (fieldwork data: CC2, CC3, CC4, CC5, CC7).

Taking the emergent themes from the Central Coast part of this research, the research team developed a series of suggestions for future strategy and action. These are documented in the full report. A summary can be seen in Figure 10.

Figure 13 Summary of Suggested Strategies and Actions for the Central Coast

Region	Strategy/ Action	Comment	
Central Coast	CC1	Refinement of Marketing Strategy (Part 1 – Understand Areas of Key Competitive Advantage)	The key areas of competitive advantage need to be properly understood first, and then actively marketed. Reliable data is needed on the numbers of ICT commuters from the Central Coast to Sydney CBD, the nature of their skills and their reasons for commuting. An outline methodology for this research has been included in Appendix 3
	CC2	Refinement of Marketing Strategy (Part 2 – Actively Market Areas of Key Competitive Advantage)	Once reliable data has been gathered on the region's key points of competitive advantage, these must be actively marketed both within and outside the region. As part of this process, marketing co-ordinators need to have access to high level decision makers.
	CC3	Telecommunications Infrastructure Improvement	Improvement to telecommunications supply should be sought from action on both the supply (lobbying of providers, promotion of local ISPs) and demand sides (awareness raising and demand stimulation). Action is needed to re-examine the level of service the region receives.
	CC4	Promotion of Call Centres, Disaster Recovery Centres, Technical Support Centres	The Central Coast has an opportunity to grow/ attract ICT industry that requires good ICT skills, low rental costs but does not require high quality telecommunications infrastructure. Thus, Call Centres, Disaster Recovery Centres and Technical Support Centres present a good opportunity for future growth. The existing examples of success should be promoted in order to exploit untapped potential.
	CC5	Future Development of Mt Penang and Other ICT Industry Locations	DSRD together with the Connect group, FDC, and Local Councils should co-ordinate activity to ensure that the momentum of emerging business centres is not lost. The 'high-tech' component of Mt Penang, the boutique ICT potential of Woy Woy and the ICT HQ/ Call Centre development of Tuggerah Business Park should be promoted.
	CC6	Promotion of Health Sector Support Industries	With relatively high numbers in the older age groups, and reportedly high numbers of younger, highly ICT skilled people, there is potential to grow the Health sector support industry. Once reliable data has been gathered, early examples of success such as Precision Medical should be promoted as examples of success.

Conclusions

The original objectives as outlined in the project brief were to identify:

- Industry use of ICT hardware, software and infrastructure in the 2 regions
- The importance of ICT to the regions' economic bases

- The regions' competitive advantages, strengths and weaknesses
- The impediments to growth of ICT
- Key factors for ICT business relocation or service provision
- The issues that need to be tackled to ensure competitive advantage

Figure 14 Project output concordance with project objectives

Objective	Summary
Investigate Industry use of ICT hardware, software and infrastructure in the 2 regions	<ul style="list-style-type: none"> ▪ Existing qualitative information on business use of ICT and infrastructure has been discussed ▪ Existing regional quantitative data on business use of ICT, Supply and Demand for ICT Infrastructure and Skills Provision has been outlined ▪ New data on the specifics of business use of ICT, ICT Skills and Training, Networks and Interactions and Future ICT Use has been gathered, analysed and described.
Determine the importance of ICT to the regions' economic bases	<ul style="list-style-type: none"> ▪ The contribution that ICT makes to Gross Regional Product (GRP) has been calculated and documented with the method made explicit ▪ The method for rolling forward these calculations to provide a KPI of changing ICT capacity in the regions has been outlined.
Assess the regions' competitive advantages, strengths and weaknesses	<ul style="list-style-type: none"> ▪ Regional strengths and weaknesses as outlined in existing documentation have been outlined ▪ Regional strengths and weakness that emerged from the industry survey and subsequent rounds of interviews an focus group discussion have been documented
Determine the impediments to growth of ICT	<ul style="list-style-type: none"> ▪ Impediments to the growth of ICT industry as outlined in existing strategy has been examined and outlined. ▪ New regional data on the impediments to the growth of the ICT industry has been gathered through the industry survey and subsequent rounds of interview and focus group discussion. These results have been analysed and documented ▪ Key impediments to the growth of ICT industry have been outlined. Recommendations for strategy and action to build ICT capacity have been provided.
Determine key factors for ICT business relocation or service provision	<ul style="list-style-type: none"> ▪ Key factors for business relocated as outlined in existing strategy have been examined and outlined ▪ New regional data on the key factors to determine business relocation or service provision has been gathered through the industry survey and subsequent rounds of interview and focus group discussion. These results have been analysed and documented ▪ Key factors for ICT business relocation or service provision have been outlined. Recommendations for strategy and action to build ICT capacity have been provided
Explore the issues that need to be tackled to ensure competitive advantage	<ul style="list-style-type: none"> ▪ Data from the industry survey, interviews and focus groups has been analysed and the key emerging themes documented ▪ A series of recommendations have been made for strategy and action to ensure competitive advantage and build ICT capacity

The research has addressed each of these areas in some detail. A brief description of the way that the project outputs have responded to the project objectives is shown in Figure 14.

This project has investigated the current nature of ICT in the Hunter and Central Coast regions. It has determined the importance of ICT to each region's economic base through the contribution of ICT to Gross Regional Product and has suggested ways in which this work can be rolled forward to benchmark the future development of ICT capacity. At the core of the project has been the collection and interpretation of data to highlight the key issues faced by the regions as they seek to drive economic development through the ICT sector. There are common issues facing each, such as the nature of the supply and demand of high quality telecommunications infrastructure, the accurate identification of exploitable competitive advantages and the co-ordination of regional activity.

The recommendations for strategy and action in the two regions that are presented in this report

represent one possible way forward for the regions to embrace the rapid development of ICT within the context of a developing information economy. This report should not be

considered a final word on the ICT capacity of the regions studied. Some areas such as the investigation of commuters' ICT skills in the Central Coast and the identification of clusters of 'smart-industry' in the Hunter require further investigation. Indeed, where appropriate, this report has laid out the way in which this investigation should be conducted and in doing so has outlined how the momentum of this work can be carried forward so that both regions can harness ICT as a driver of regional development in its widest sense.

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Appendix 1



This survey is part of an important project funded by the Department of IT Management and the Department of State and Regional Development. Its purpose is to understand the ICT (Information and Communications Technology) needs of the Hunter and Central Coast regions and to develop strategies for each region's development in partnership with industry. Your help in completing the survey will assist us to do this. CRRI is the independent research group responsible for the research. You can be assured that all information shared with the team will be treated as confidential and that individual data will not be shared with anyone else. For information please contact the Director of CRRI Professor Trevor Cairney (t.cairney@uws.edu.au).

Name	
Name of firm	
Postal address	
Physical address (if different)	
Phone	
Fax	
E-Mail	

A. Organisational Details

A1 Please give the address of your head office (if different from address given above)

A2 Please indicate the industry sector that most accurately describes your business

Data Processing Services	<input type="checkbox"/>	Computer Consultancy Services	<input type="checkbox"/>
Information Storage and Retrieval Services	<input type="checkbox"/>	Computer Maintenance Services	<input type="checkbox"/>
Telecommunications Services	<input type="checkbox"/>	Office Equipment Rental	<input type="checkbox"/>
Property and Business Services	<input type="checkbox"/>	Computer and Business Machine Manufacturing	<input type="checkbox"/>
Telecommunications and Broadcasting Equipment Manufacturing	<input type="checkbox"/>	Electronic Equipment Manufacturing	<input type="checkbox"/>
Cable and Wire Manufacturing	<input type="checkbox"/>	Finance and Insurance	<input type="checkbox"/>
Agriculture, forestry and fishing	<input type="checkbox"/>	Education	<input type="checkbox"/>
Mining	<input type="checkbox"/>	Non IT- Manufacturing	<input type="checkbox"/>
Government, Administration and Defence	<input type="checkbox"/>	Health and Community Services	<input type="checkbox"/>
Electricity, Gas and Water Supply	<input type="checkbox"/>	Personal and Other Services	<input type="checkbox"/>
Computer Wholesaling	<input type="checkbox"/>	Other Wholesale Trade	<input type="checkbox"/>
Transport and Storage	<input type="checkbox"/>	Construction	<input type="checkbox"/>
Other	<input type="text"/>		

A3 Please describe your firm's key product or service

A4 Please indicate the number of employees in your firm

0-9 <input type="checkbox"/>	10-19 <input type="checkbox"/>	20-49 <input type="checkbox"/>	50-99 <input type="checkbox"/>	100+ <input type="checkbox"/>
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A5 Please specify the geographical location of your clients, staff, suppliers and business partners. (Tick all that apply)

	Central Coast	Sydney	NSW	Inter-state	Over-seas
Clients	<input type="checkbox"/>				
Staff	<input type="checkbox"/>				
Principal suppliers	<input type="checkbox"/>				
Business Partners	<input type="checkbox"/>				

A6 Is your firm a member of any business networks?

Yes <input type="checkbox"/>	No <input type="checkbox"/> Go to Section B
------------------------------	---

A7 How are the firms in this network association connected?

A8 What is the name of the network?

B. IT Issues

B1 Does your firm use computers?

Yes <input type="checkbox"/>	No <input type="checkbox"/> Go to <input type="checkbox"/> Section C
------------------------------	--

B2 Which specific ICT applications does your firm use (1=used least often, 5=used most often).
Leave blank if never used

Business	Database	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Accounting	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Inventory	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Project management	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
Admin	Word processing	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Spread-sheets	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Publishing	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
HR	Timesheets/ payroll	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
Design	CAD, CADD	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
Manu- facturing	Supply chain management systems	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Ordering	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Assembly	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	Production scheduling	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	CIM	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
	CAM/ CASE	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>
Other IT application	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>	
	(please give details)	
	<hr/> <hr/> <hr/> <hr/>	

0 <input type="checkbox"/>	1-5 <input type="checkbox"/>	6-10 <input type="checkbox"/>	11-50 <input type="checkbox"/>	(>50 - details) <input style="width: 90%;" type="text"/>
----------------------------	------------------------------	-------------------------------	--------------------------------	--

B4 Please estimate the number of IT staff in your firm

0 <input type="checkbox"/>	1-2 <input type="checkbox"/>	3-5 <input type="checkbox"/>	6-10 <input type="checkbox"/>	(>10 - details) <input style="width: 90%;" type="text"/>
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B5 Does your firm have a local area network (LAN)

Yes <input type="checkbox"/>	No <input type="checkbox"/>
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B6 Please give an estimate of your firm's expenditure on IT

	\$ thousand			\$ million	
	under 50	50 to 149	150 to 499	1/2 to 1	over 1
Acquisition	<input type="checkbox"/>				
Internal costs	<input type="checkbox"/>				
Software licensing	<input type="checkbox"/>				
Training	<input type="checkbox"/>				
Systems development	<input type="checkbox"/>				
Maintenance	<input type="checkbox"/>				
External services	<input type="checkbox"/>				

B7 Please indicate the source of your IT purchases

	Central Coast	Sydney	NSW	Inter-state	Over-seas
Acquisition	<input type="checkbox"/>				
Internal costs	<input type="checkbox"/>				
Software licensing	<input type="checkbox"/>				
Training	<input type="checkbox"/>				
Systems development	<input type="checkbox"/>				
Maintenance	<input type="checkbox"/>				
External services	<input type="checkbox"/>				

B3 Please estimate the number of computers in your firm

B8 Please state the primary means of communication

	E-mail	Phone	Fax	Face-to-face
Customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Business-Partners	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Head-office	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

C. IT Skills

C1 Please give the approximate numbers of staff with the following IT skills

Office packages (e.g. Word, Powerpoint)	___
Database (e.g. Access)	___
Specialist Software (Statistics software, GIS)	___
Project management (eg. MS Project)	___
E-mail/ Web Browsing (e.g. Outlook, Eudora Netscape)	___
Web-page development (e.g. Dreamweaver)	___
Digital Design/ Multimedia	___
Systems development/ networks	___
Programming (e.g. C++, JavaScript)	___
Process Control	___
Systems Maintenance	___
Other IT Skills	(details) _____ _____

C2 Can you estimate the number of staff with formal IT accreditations (e.g degrees, diplomas, etc)?

Total accreditations	_____
----------------------	-------

C3 If you have staff with IT accreditations, with which institutions are these held?

C4 Where are your IT training providers based?

Central Coast	<input type="checkbox"/>
Sydney	<input type="checkbox"/>
Elsewhere in NSW	<input type="checkbox"/>
Other	_____

C5 Are you happy with the training offered by local training providers?

Yes	<input type="checkbox"/>	No	<input type="checkbox"/>
(details) _____			

C6 In which areas have you identified specific skills shortages?

Office packages (e.g. Word, Powerpoint)	<input type="checkbox"/>
Database (e.g. Access)	<input type="checkbox"/>
Specialist Software (Statistics software, GIS)	<input type="checkbox"/>
Project management (e.g. MS Project)	<input type="checkbox"/>
E-Mail/ Web-Browsing (e.g. Outlook, Eudora Netscape)	<input type="checkbox"/>
Web-page development (e.g. Dreamweaver)	<input type="checkbox"/>
Digital Design/ Multimedia	<input type="checkbox"/>
Systems development/ networks	<input type="checkbox"/>
Programming (e.g. C++, JavaScript)	<input type="checkbox"/>
Process Control	<input type="checkbox"/>
Systems Maintenance	<input type="checkbox"/>
Other IT Skills	(details) _____ _____

C7 Which areas are your staff recruited from? (please include approximate % figure)

Central Coast	<input type="checkbox"/>	Sydney	<input type="checkbox"/>
Other NSW	<input type="checkbox"/>	_____	
Other (details)	_____		

C8 What is the main recruitment method used? (e.g. recruitment agency, newspaper advertisement)

D. Internet/ E-Commerce

D1 Does your firm have an internet connection?

Yes <input type="checkbox"/>	No <input type="checkbox"/> Go to Question D4
------------------------------	---

D2 What type of internet connection does your firm have?

ISP dial-up	<input type="checkbox"/>	ADSL	<input type="checkbox"/>
ISDN (on-ramp)	<input type="checkbox"/>	Leased data line	<input type="checkbox"/>

D3 Is your current internet connection satisfactory?

Yes <input type="checkbox"/>	No <input type="checkbox"/>
(if No please give details)	
<hr/>	

D4 Does your firm have a website?

Yes <input type="checkbox"/>	No <input type="checkbox"/> Go to Section E
------------------------------	---

D5 How is your website used?

Advertising	<input type="checkbox"/>
Provide information to customer	<input type="checkbox"/>
After-sales service	<input type="checkbox"/>
On-line orders/ sales	<input type="checkbox"/>
Tracking orders/ delivery	<input type="checkbox"/>

D6 Is your web site used for 'Business to Consumer' (B2C) transactions (customer purchase on-line)

Yes <input type="checkbox"/>	No <input type="checkbox"/>
------------------------------	-----------------------------

D7 Does your company use 'Business to Business' (B2B) transactions for supply chain management and/or e-procurement?

Yes <input type="checkbox"/>	No <input type="checkbox"/>
------------------------------	-----------------------------

D8 Is your website address included on office stationary or marketing material?

Yes <input type="checkbox"/>	No <input type="checkbox"/>
------------------------------	-----------------------------

E. Future Strategy

E1 Please give an estimate of your firm's total yearly revenue

<50K	50K-149K	150K-500K	500K-1M	>1M
<input type="checkbox"/>				

E2 What is the greatest barrier to your firm's growth?

<hr/>

E3 Which (if any) of the following does your firm plan to expand in the next 12 months?

IT hardware	<input type="checkbox"/>
IT software	<input type="checkbox"/>
LAN	<input type="checkbox"/>
Internet	<input type="checkbox"/>
E-mail	<input type="checkbox"/>
Website development	<input type="checkbox"/>
On-line catalogue	<input type="checkbox"/>
On-line Sales	<input type="checkbox"/>

F. Closing Details

F1 Has this survey stimulated any thought about your firm's use of ICT?

Yes <input type="checkbox"/>	No <input type="checkbox"/>
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F2 Is there any ICT business support that your firm would like to receive?

Yes <input type="checkbox"/>	No <input type="checkbox"/>
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F3 If yes, can you please provide details?

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F4 Are there any other comments you would like to make?

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Thankyou for completing this survey. Your response will be treated in confidence and used for statistical purposes only.

Please return the completed survey by 26h April to:

Prof. Trevor Cairney, CRRI
University of Western Sydney (Kingswood)
Locked Bag, 1797. Penrith South DC.
NSW 1797 [Fax to: 02 4736 0377]

For more information about this research contact:

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