

The Resource Advantage:

**Shaping a Global Future for the
Western Australian Information
and Communication Industry**

- Strategic Directions -



Telesis Communications: 20 Bannister Street, Fremantle, Western Australia 6160

Forward

Information and Communication Technologies are at the epicentre of a remarkable series of economic, social and cultural changes confronting our world today. Governments around the world have recognised that many of the traditional assumptions as to how they operate must be re-examined and that the threats and opportunities facing the broader community need to be closely considered. We are undoubtedly living in fascinating times.

The Office of Information and Communications within the Department of Commerce and Trade has commissioned this report as the first stage in assessing the most appropriate strategic direction for the Western Australian Government to take in promoting the development of the Information and Communication Technology (ICT) sector. Operating from a small, isolated, domestic market presents particular challenges. But the State also enjoys considerable advantages that can be harnessed to form a dynamic strategic direction for the local industry.

This Strategic Directions document is the result of a series of stages. They have included a detailed survey of the Western Australian ICT industry and an environmental scan of industry development strategies pursued by various State, Provincial and National Governments around the world. Together these provide a local and global snapshot of this dynamic industry and an indication of where we are now. The survey of the local industry and the international scanning exercise served as background information for industry participants in a Scenario Planning Workshop.

The strategic directions outlined here are the primary inputs into the preparation of an industry development strategy and complementary support programs by the Office of Information and Communication for Western Australia's Information and Communication Technology Industry.

April, 1999

TABLE OF CONTENTS

THE INFORMATION AND COMMUNICATION TECHNOLOGY INDUSTRY.....	4
INTRODUCTION.....	4
INFORMATION & COMMUNICATION TECHNOLOGY TRENDS AND ISSUES.....	6
GLOBAL ISSUES.....	6
AUSTRALIAN ISSUES	7
WESTERN AUSTRALIAN ISSUES.....	8
REGIONAL WESTERN AUSTRALIAN ISSUES	9
WA INDUSTRY SWOT.....	10
INTERNATIONAL ICT INDUSTRY SCAN.....	11
AUSTRALIAN STATES.....	11
INTERNATIONAL CASE STUDIES.....	13
A VISION FOR THE WESTERN AUSTRALIAN ICT INDUSTRY:.....	17
STRATEGIC INITIATIVES.....	18
WESTERN AUSTRALIA AS A GLOBAL ICT BUSINESS INCUBATOR	18
CREATE A DISTINCTIVE WESTERN AUSTRALIA APPROACH AND BUILD COMPETITIVE ADVANTAGE.....	24
CREATE EXCITEMENT, OPTIMISM AND A SENSE OF DIRECTION	30
AN ICT INDUSTRY VISION	30
REALISING THE VISION	31
MAKING IT VISIBLE.....	31
CONCLUSION.....	33

The Information and Communication Technology Industry

Introduction

The Information and Communication Technology (ICT) Industry is at the heart of the development of the Knowledge Economy. Most of the sectors that make up the industry fill positions as the fastest growing in the world.

Western Australia's ICT industry is no exception. It grew by almost 30% last year, almost four times the pace of the State's economy, which has itself been performing consistently better than the national economy. Based on the predictions of the industry growth this year is expected to be even higher. Comparing this with State Treasury's current estimate of 5% growth for the Western Australian economy the ICT Industry will grow at more than six times this rate. In some ICT sectors the anticipated growth is truly astronomical. Companies involved in **Production of Software, Distribution of ICT Products and Provision of ICT Services**, in particular, have all shown extremely strong growth in recent years and expect this to continue.

WA's Gross Domestic Product in comparison with ICT Industry Revenue¹

	Total 97/98 \$m. (est)	% Growth 97/98 (est)	Projected % Growth 98/99
WA Gross Domestic Product	54,872 m.	8.5%	5%
ICT Industry Revenue	1,116m.	29.2%	34.2%
ICT by industry grouping:			
Manufacture of ICT equipment	102m.	10.7%	15.6%
Production of software	125.6m.	57.9%	46.7%
Distribution of ICT products	493.2m.	43.2%	35.1%
Provision of ICT Services	358.5m.	49.6%	38.9%
Provision of services through ICT	33.5m.	24.3%	75.9%
Commercialisation of ICT	0.22m.	0.0%	20%
Other	3.1m.	17.5%	7%

Based on the most recently available industry comparison figures the sector already ranks as one of the State's major industries, accounting for 2.6% of Gross State Product two years ago.²

WA Gross Domestic Product, by Sector, June 1997³

Sector	\$ Million (\$m.)	% of Total
Mining	8217m.	16.9%
Manufacturing	4777m.	9.8%
Property and business services	4079m.	8.4%
Construction	3937m.	8.1%
Retail Trade	3457m.	7.1%
Wholesale Trade	2576m.	5.3%
Transport and storage	2238m.	4.6%
Electricity, gas and water	1559m.	3.2%
Communications*	1265m.	2.6%
Finance and insurance	837m.	1.7%
Accommodation, cafes, restaurants	794m.	1.6%
OTHERS	14,821m.	30%
TOTAL	48557m.	100%

Aside from the industry's own spectacular growth its products and services are having a profound impact on virtually every other industry in developed economies. This is certainly the case in the Western Australian economy, in fact these "flow-on" effects may be even greater here.⁴ The major reason for the depth of ICTs effects is that they are playing an increasingly important role in enhancing all the major stages of production: development through shortening innovation cycles, reducing production costs, providing management with access to timely strategic information and increasing logistical support. No other technologies have had such a profound effect across such a range of different processes.

Even Western Australia's huge mining and resources sector is intensive user of knowledge products and services. Although the popular imagery of these industries may be based around massive machinery moving mountains or drilling deep into the sea bed

none of these projects are even contemplated without massive data gathering and analysis taking place.⁵

Information & Communication Technology Trends and Issues

These trends and issues have been divided into sections. From the global perspective looking at those issues that are affecting all countries to a greater or lesser extent and those which are peculiar to Australia. A summary of the Western Australian Information and Communications Technology industry survey follows, concluding with a number of additional issues of concern to regional areas. This hierarchy of issues provide a very brief background picture to the detail which follows in the country and state case studies.

Global Issues

- Globalisation is driving increasing levels of competition in all markets. This trend carries the weight of law through the impact of GATT and the WTO⁶. For national (and state) governments this has reduced their capacity for intervention.
- The extension of globalisation and GATT/WTO-approved policies has significantly expanded opportunities for Multi National Corporations (MNCs).
- An imbalance is also developing between governments and MNCs in relation to industry information, especially at a global level. This is even more prevalent for state or provincial governments where, combined with wide-spread labour market concerns, MNCs hold a potent bargaining position.
- Developed economies are moving into the fastest growing sectors - information and knowledge-based industries and Elaborately Transformed Manufactures.
- Commodities are experiencing a continuing long-term decline in the prices they are able to attract.
- ICT's are significantly changing the relationships between regions; between centralisation and decentralisation. (The concentration of power in global

financial markets in New York, London and Tokyo and the relative decline in the importance of "provincial markets" is the most significant example of this trend.)

- Management at all levels in both the public and private sectors is becoming more challenging as the "steady state" era ends and is replaced by far greater volatility.
- ICT spending is predicted to grow 9.6% annually from \$US720.5b in 1997 to over \$US1.1 trillion in 2002. Software, services and data communications will be the leading sectors.⁷
- By the end of this year (1999) one-third of US homes will be online, women will be in the majority and the US will no longer account for the majority of Internet users. Internet users will increase by 28% to 147m. giving the 'Net the same population as Japan. Net commerce will double, to \$US68 bn. The online economy is growing 30 times faster than the global economy⁸.

Australian Issues

- MNCs dominate Australia's Information and Communication Technology Industries.
- Australia is a heavy consumer of (predominantly imported) ICTs. It has a massive trade imbalance in ICTs.
- Australia's tax regime, particularly its capital gains tax rates, are considered major disincentives for high-growth, high technology companies.
- The investment community tends to be risk averse (investors in exploratory mining companies are an interesting and important exception to this). Investment strategies seem to be more often driven by investment retention than expansion.
- There is a low level of understanding and appreciation of each other's roles between Australia's researchers and investors in the process of commercialising technologies.

- Australia has an excellent record in research and development but a dismal history in commercialising this work.
- Australia owns relatively few global brands.
- Australia has traditionally had a narrow economic base dependent on commodities. Although the late 1980s and 1990s have seen a massive expansion in the service sector, the bulk of this has been domestically-focused.
- As with virtually all commodities, those Australia depends on have fallen in price and continue to fall.
- There are signs of a “brain drain” beginning to develop again, centred on ICT-skilled people.
- Australians generally have an excellent quality of life. Our distance from the rigours and realities of global conditions has masked the speed and rate of economic decline and, possibly more importantly, our lack of preparedness for forthcoming changes.
- Although the growth in Australia’s Internet population has been rapid we have slipped from fifth in the OECD in July 1997, to ninth a year later. We are now below the OECD average.

Western Australian Issues

- The Western Australian ICT industry is a fragmented and broad ranging group of businesses and organisations, many of which identify their business more in terms of the clients they service than their engagement with ICT.
- A diverse range of attitudes towards growth is reflected across the industry with almost half indicating satisfaction with their current level of business activity.

- Despite the relaxed approach of many companies, the growth rate for the industry is extremely high.
- Although the **production of software** sector indicated the highest growth rate for 97/98 at 57.9%, the **provision of services through ICT** sector is expected to dominate in the year ahead, indicating projected growth in 98/99 of 75.9%.
- Orientation to export and interstate markets is high. Products and services from Western Australian companies are being sold to interstate and overseas markets by 63.2% of those surveyed. For this group interstate markets provide 51.3% and overseas markets providing 20.3% of annual revenue.
- More than half the companies expect increasing competition from global competitors to affect their organisations over the next three years.
- They paint a gloomy picture of their capacity to keep pace, indicating the lack of funding for export and for the development of new products; the capacity to keep value-adding and short product life as barriers to future success.

The needs identified by industry were to:

- Inform industry of what investment capital is available
- Improve the efficiency and cost-effectiveness of the telecommunications network

...and to encourage improvements in expertise in the industry:

- from a marketing perspective
- from a management perspective
- through working with the educational institutions and the industry associations

Regional Western Australian Issues

Those establishing and building ICT companies in regional areas face all of the issues and challenges outlined above, plus a number of others. These include:

- Limited access to competitive pricing of telecommunications services and, in some cases, more advanced services;

- Consistent difficulties in retaining and attracting skilled, motivated staff;
- By definition these firms tend to be some distance from larger target markets;
- The supporting services required for sophisticated ICT and other knowledge-based businesses are often non-existent (eg. international marketing, legal or accounting advice);

All of these issues contribute to generally higher operating costs.

WA Industry SWOT

The Western Australian ICT industry considered its **STRENGTHS** to be:

- _ the quality of personnel with world-class skills and its capacity for innovation.
- _ good telecommunications infrastructure and
- _ Australia's international reputation for technical excellence.

WEAKNESSES that were identified were:

- _ a lack of government support
- _ the small local market
- _ the lack of venture capital and ongoing capital for development.

The industry identified **OPPORTUNITIES** for competing outside Western Australia

- _ by providing solution-based approaches, rather than straight technical solutions, and
- _ through the capacity of the industry to broaden into other areas of industry specialisation.

Listed under **THREATS** were:

- _ WA's isolation from major decision-making centres
- _ lack of access to venture capital and
- _ the potential loss of skilled and creative personnel to other parts of the world.

International ICT Industry Scan

This section summarises some of the industry features and policy approaches found in the various state and country case studies which may be relevant to Western Australia.

Australian States

New South Wales

Summary

The state's ICT sector has flourished through Sydney's position as the primary gateway to the US, its position as a sub-regional centre in global financial markets and physical beauty. These have all contributed to making Sydney the nation's ICT capital and attracted many MNC offices.

Other Features

- Increasingly sophisticated investment community plus national capital for the advertising, entertainment and media industries
- Competitive telecommunications market
- Strong ICT research base

Queensland

Summary

Support for the ICT sector has been bi-partisan, high level and focussed. There appear to be good links between government agencies and the industry which has led to the production of a number of highly functional and practical support programs. The state has attracted some companies, particularly encouraging companies from other states to relocate.

Queensland's ICT industry has the fastest employment growth per capita of any state

Other Features

- High level, bi-partisan support for the sector
- Strong links with industry
- Strongly focussed on supporting local companies rather than seeking savings at all costs

South Australia

Summary

Has recognised the opportunity ICT presents to rejuvenate its economy. Has sought to build alliances with a number of MNCs both to extend existing strengths and to act as a clearing house for industry development.

Other Features

- Have focussed on competitive strength in defence research
- Implemented an active knowledge entrepreneur incubation program
- Taken a “whole of government” approach to outsourcing

Victoria

Summary

The Victorian Government’s ICT strategy has been recognised internationally as one of the best in the world, particularly for its support from senior politicians.

The incorporation of content as a central part of policies, beyond simply hardware and software has also attracted much attention.

Other Features

- Government has taken on the role of “bleeding edge” customer
- Policies reflect a greater understanding of the knowledge economy and its dynamics than is found in most ICT industry development policies

- The drive for these policies has come from the most senior levels of government, overseas and local industry reps have commented about how well informed these politicians are of the issues.

International Case Studies

Canada

Summary

Any discussion of the Canadian economy has to take close account of its giant neighbour. The US provides a massive, almost domestic, market and an ever present threat to Canadian companies. This challenging paradox has encouraged a culture of seeing clear and distinct political and economic boundaries between what is acceptable and what is not in striking an balance.

Other Features

- strong R&D culture
- growing venture capital industry
- North American Free Trade Agreement membership massively expands market

Finland

Summary

Has been at the front line of changes within the eastern bloc which have forced a significant adjustment to its economic assumptions. Having been closely economically tied to the former USSR the country has reoriented itself both in terms of geographical and sectoral markets.

Other Features

- aggressive global niche marketing
- strong export focus
- very strong niche R&D activities and...
- ...excellent commercialisation credentials

- Clustering of R&D and technology companies

India

Summary

Successive national governments have been reorienting the country's economy to being more open and market oriented. This has been particularly constructive for the ICT industries.

State governments have also begun pursuing ICT opportunities.

Other Features

- very strong and extensive technical skills base
- significant skills in managing distributed work projects
- located in a time zone ideal for global workflow
- working to develop positive outcomes through MNC partnerships
- growing government support for the development of local companies expanding government push to develop clusters/high tech zones

Ireland

Summary

Ireland's turn-around over the past decade has been extraordinary, albeit with substantial, long-term assistance from the European Union. Having said this the government has shown a vigorous strategic vision and determination to build the fastest growing economy, largely through ICTs.

Other Features

- successful exploitation of relatively cheap, skilled labour force
- highly successful industry attraction policy (NB an important caveat to this is the European Union's long-running and substantial funding)
- strong export culture

- sympathetic corporate tax regime
- well developed understanding of online business issues at senior levels of government and business
- excellent personal networkers
- make good use of the global "Irish Network"

Singapore

Summary

The ICT sector has benefited from the government's traditional centralised planning approach although this strategy has raised questions amongst some observers about dampening entrepreneurial activity.

Other Features

- strong strategic focus
- significant optimisation of available assets
- strong "whole-of-society" approach to awareness and involvement
- substantial focus on infrastructure optimisation

Taiwan

Summary

Like Ireland, Taiwan has turned itself into an ICT powerhouse over the past decade. It has built on its strong manufacturing capacity to move into higher value stages of production. The success of the ICT and other industries over recent years has given the country massive reserves making Taiwan's investment community one of the largest and most active in the world.

Other Features

- strong export focus
- leveraged MNC presence to build partnerships

- strong enterprise culture contributing to company building and enormous investment activity
- business-friendly tax policies
- significant levels of off-shore experience, increasingly many of these emigres are returning
- strong off-shore manufacturing capacity and management skills (based in mainland China) to offset growing domestic labour costs
- government support for building local companies
- strong clustering focus by government and companies
- a systematic and serious approach taken by both government and companies to global market intelligence gathering

A Vision for the Western Australian Information and Communication Technology Industry:

To build a vibrant and dynamic Western Australian Information and Communication Industry that is:

- actively engaged with global markets, building strong and sustainable local markets;*
- recognised internationally for its technical, product and management innovation in selected market niches;*
- reversing the State's trade imbalance in ICT products and services;*
and
- generating high quality jobs.*

In achieving these goals the ICT Industry will position itself as the vanguard for the creation of a sustainable Knowledge Economy in Western Australia.

Strategic Initiatives

The strategic initiatives outlined here are classified under three broad headings:

- **Western Australia as a Global ICT Business Incubator**
- **Distinguishing the Western Australian ICT Industry**
- **Creating excitement and optimism**

The programs and opportunities which have been identified here are intentionally biased toward being demand-pull strategies which encourage export-focussed companies. In the volatile and changing global environment in which the ICT and many other industries operate today it does not appear logical to take any other approach.

Western Australia as a Global ICT Business Incubator

We propose that a basic infrastructure to support an ICT industry in Western Australia will include:

The existence of and access to world-class physical infrastructure at globally competitive prices

- **Audit the cost of telecommunications access and benchmark this against other markets, taking account of the extent of the “USO-ACCC gap”**

The bulk of the advantages in the liberalisation of the telecommunications industry have been in the major cities on the east coast and within the corporate sector. Small to Medium Enterprises (SMEs) and other customers in Western Australia have fallen from the attention of most companies. Even though the service they receive is well above that set by the USO⁹ this group see relatively little of the advantages of industry liberalisation. This overlooked group make up the “USO-ACCC gap”.¹⁰

Ready access to more advanced services at competitive prices is a key element for content companies, both in terms of their immediate operations and in building their businesses in the early stages through a critical domestic market.

- Audit community, government and business understanding and connection to electronic communications and benchmark this against other markets
 - A substantial and critical market which has an understanding of and access to these online services is another crucial factor in building local markets which will, in turn, build opportunities for local businesses.
- Building critical and demanding customers through awareness and training programs for business on business on the web, EDI/business to business commerce, connect-the-community projects and the like
- Aggregate demand

A supportive new structure for industry

- Market-focussed clusters
 - Rather than developing clusters around particular technologies the emphasis should be on target markets or technology application. The main rationale for them should be to build the capacity to “bundle” the output of SMEs¹¹ into applications and/or solutions, eg the aXcess car component project¹²
- ICT Small to Medium-sized eXporters (SMXs) advocacy and leadership group
 - Western Australia’s locally-owned ICT exporters are not well represented in the executive positions of the industry associations. These positions tend to be filled by representatives of either locally-owned companies whose primary focus is the domestic market or by representatives of the state offices of Multi-National Companies represented in Western Australia. This, in turn, has a significant impact on representation in positions on reference groups and committees established by government to consult with industry. This structural aberration has given the Western Australian ICT industry agenda a bias toward issues concerned with the domestic market.
- Global Business Readiness Centre

This initiative has wider relevance beyond the Information and Communication Technology sector to local SMEs in all parts of the economy. Particular emphasis should be placed on assisting and preparing SMXs wishing to enter the Global Knowledge markets which are the areas of most rapid growth but also amongst the most volatile and challenging. The Queensland (http://www.dcilgp.qld.gov.au/index_comminfo.html) and Canadian Government's (<http://www.strategis.ic.gc.ca/>) WWW sites all offer different but informative examples of useful online information.

- **A Global Business Cluster**

This initiative would be closely linked to the Global Business Readiness Centre. This could include support companies capable of assisting on global knowledge industry marketing, global finance, global market intelligence etc. (This focus on global business serves as the next “layer” around a series of the specific market clusters mentioned above.)

- **Attraction of venture capital, removal of Capital Gains Tax**

Notwithstanding the recent activity toward a more active and higher risk investment market as well as the recent discussion nationally of the need for more sympathetic tax regimes for high growth companies this area remains highly problematic. The current mood has more of the feel of a gold rush with many rash investment judgements being made which could well lead to a backlash later if/when hopes are not realised.

A more solid foundation for the financing and assessment of Information and Communication Technology investments has to be put in place.

The “right” business environment

An industry development strategy has three credible options. These can be summarised as Build, Buy or Repatriate. The right environment is essential to enable Western Australia to:

- **Build** - start and grow Western Australian businesses
- **Buy** - attract strategically selected MNCs and Multi National SMEs in service and product sectors
- **Repatriate** - attract Western Australian skilled emigres back

None of these options are mutually exclusive. It is very likely and highly desirable that all three should be used, in varying degrees, depending on the existing structure of the industry, its future vision and the needs of the indigenous industry.

The structure of the WA industry has been outlined in the early parts of this document. In summary, the vast majority of the activity – measured both in turnover and in number of establishments and employees is concerned with the local market. The bulk of this domestic turnover is earned by the Western Australian offices of Multi National Corporations.

The State also has a significant number of largely “invisible” Information and Communication Technology exporters operating in niche markets. In fact Western Australia’s ICT industry earns about twice the proportion of its revenue off-shore than the national industry as a whole. But it should be pointed out that this is from an extremely low base. Western Australia also has pockets of international standard Information and Communication Technology research.

Integrating these elements successfully needs sharp focus at several levels. A clear (and clear-eyed) assessment is required of what Western Australia wants to achieve in the Global Knowledge Economy generally and Information and Communication Technology in particular. This must then be matched with what Multi-National Corporations and Multi-National SMEs¹³ want of Western Australia.

There must be a clear focus on what Western Australia wants...

- Career paths to retain and extend its graduates and professional workers

- High skilled jobs (Q & Q – both quality and quantity), learning experiences so workers retain their global “edge”, high level R&D activity
- International exposure for both employees and local SMXs
- Channels to market

Which must be matched with what MNCs and Multi-National SMEs want of

WA:

- Infrastructure designed to meet their needs, including universities, R&D capabilities, training, taxation regimes, a pool of skilled labour and personnel with “on-the-pulse” knowledge, ideas and experience
- Leading-edge projects with leading-edge customers, supported by procurement processes which enable innovative solutions from the private sector, fast-track importation of new technologies and ideas, and which enable partnering between leading-edge customer and local and overseas suppliers
- Support for their operation in Western Australia through remote location technologies (see Remote Products and Services below) and transport access

Leadership

- Western Australian Government

The Premier and Treasurer must *understand, believe in and commit to* the future of the Information and Communications Technology industry in Western Australia and the future global connected-ness of Western Australia through strategic applications of ICT.

It is clear from the environment scan completed for this project of policy and strategic approaches taken by state and federal governments internationally that none have succeeded without the informed commitment of their political leadership at the highest levels.

Another feature of most of the success stories has been bi-partisan support for an economy's ICT vision, also at the most senior level.

- **Western Australian Information and Communication Technology Industry**

As has been mentioned above, industry associations are mostly organised along traditional, technology lines and their leadership is primarily domestically focussed, largely diverting policy initiatives to local concerns. This can only be described as a zero sum game. It is one that is primarily benefiting the local offices of the Multi National Corporations.

The current focus places an emphasis on exporting Western Australian dollars rather than locally-produced ICT products and services.

Create a Distinctive Western Australia Approach and Build Competitive Advantage

As the world economy converges and becomes increasingly interlocked and interdependent the challenge for a state such as Western Australia is to differentiate by building world-class strengths, ideally in flourishing global market segments. In this regard the news for the State is both good and bad: we have extraordinary wealth and strong export capacity in mining, resources and primary production but the commodities produced by these industries are virtually all in long-term decline, and in many cases based on non-renewable resources. The vast scale of Western Australia's riches in these commodities has tended to divert attention from the vulnerability of many of these markets and the need to be addressing alternatives.

Much of the Information and Communication Technology SMX activity within Western Australia has strong connections with these commodity industries. Building on these and extending on them in a systematic and strategic way offers a clear path to creating a distinctive Western Australian approach to global ICT markets and is the key to building substantial competitive advantage.

Identifying the Target

The focus must be fixed firmly to what Western Australia wants from the new global economic order, including:

- Quality and quantity of Knowledge Economy jobs
- The retention and attraction of skilled young people, (stabilise population movements and balance demographics)
- Provide complete career paths, learning environments, international work and cultural experience
- Optimal conditions for the development and growth of Information and Communication Technology SMXs.
- Opportunities for latest technologies, "on-the-pulse" ideas and innovations
- Reasons for fast-track inward flow of latest technologies and ideas

- Efficient and effective government, business and communities where ICT applications can best support these results

These goals and desires must be matched with...

- What industry in Western Australia wants of Western Australia
- What international companies will want of Western Australia in investing and locating in Western Australia

Identified Opportunities

As has been mentioned above, a variety of Western Australian organisations – both public and private – have already recognised the possibilities which flow from the State’s existing strengths and have built on them successfully. The opportunities detailed here are concerned with ways of extending those further and to create greater synergies.

In keeping with the focus of this document to emphasise demand-side initiatives most of those mentioned here detail opportunities which are readily accessible to Western Australia through its existing leading edge customers and/or applications. Each of the opportunities identified here have the potential to be the basis of a market-focussed cluster, they include:

The Resource sector - mining, oil, gas

Opportunities – The establishment of a Center of Excellence in Mining, Oil and/or Gas in partnership with a global partner (eg one of the global consulting firms). Such an arrangement would leverage existing service provision, research and commercial activity in the sector and provide it with a far stronger, international profile.

This Centre could function along the lines of the Marketing Clusters or the aXcess car project mentioned earlier in linking these companies to share expertise and experience and to create a common shop-front for the State’s existing strengths which others could gain from.

Environment and Land Care

Opportunities – Current work in dealing with Western Australian salinity and land care-related problems offer numerous opportunities for the innovative application of ICTs and their commercialisation internationally. Once again, this prospect leverages off strong existing activity.

Western Australian State Government

Opportunities - Innovation in services delivery - experience around the world shows that successful industry grows around innovative government procurement. In the current climate, where governments are looking for opportunities to cut costs but mindful of constituents' scepticism as to the impact on services, innovative managerial and technical solutions are highly prized.

The Western Australian Government's dominant position in the State makes it a crucial participant, at a whole range of levels.

This opportunity requires innovation in rethinking particular services and their delivery as well as tendering and contracting methods that enable private sector innovation and significant scale economies to flow.

Health

Numerous reports and studies have commented on the need for reform in public health systems generally. As a sector that accounts for a the largest portion of the State budget the incentive is even greater. This should not be confined to remote telehealth, but include customer records, common IT platforms between hospitals, implementing systems to encourage doctors to become more ICT-literate.

Remote Products and Services

This opportunity has two dimensions, tangible products and the services which can enable these products to be utilised to their fullest potential. "Remote" in this context means any area far removed from a central location. It can equally well

apply to the branch office of a MNC in Perth as it can to an isolated mining camp in the Western Desert of the State.

Specifying, designing and integrating technologies to meet the needs of isolated users, particularly mining companies, has been the foundation for many Western Australian ICT companies. Dealing with the technical and physical challenges of meeting these customer needs has build a wealth of experience and been the catalyst for extensive innovation into other applications. This experience and track record in conquering these unforgiving conditions are increasingly marketable capacities, if “bundled” correctly.

From a services perspective, as more work is being converted into digital format and our capacity to gather, store, manipulate and move it increase exponentially there is a growing need to understand the human factors in working in a distributed workplace.

To realise the opportunities for distributed work – particularly for an isolated community such as Western Australia – there will be significant demand for people who can codify the knowledge of organisations and become information content and context “removalists”. This “human technology” offers significant potential for decentralisation within Western Australia but it also offers major export and investment attraction opportunities. By providing seamless relocation/new location set-up and the ICT platforms it would support the presence of MNCs and Multi-National SMEs remote from head office. This would address:

- The transfer of tacit knowledge of the organisation
- Common ICT platforms
- Knowledge capital - not degraded over time because of remote location

In addition to assisting companies to establish operations within Western Australia the technology transfer of this expertise would be of even greater value in terms of the functioning of their other remote offices elsewhere in the world.

Education

Within Western Australia the sector is an extremely heavy consumer of Information and Communication Technology products of all types (telecommunications, computers and content), internationally it is rapidly becoming a leading-edge customer for a vast array of products.

Pockets of private sector activity producing educational products exist within the State and the Ministry itself has been successful in its own right in marketing products more widely. These can be facilitated and expanded to the next level in partnership with the Education Department of WA and organisations capable of maximising the global market potential of complex knowledge products.

A Demand-side Obsession

The focus must be firmly on the customer, or the market, a demand side emphasis is essential for all initiatives:

- “Leading-edge customer” clusters
 - The clustering/incubator model should not be confined to the supply side of the process. The possibility of creating clusters from the demand side, clusters of customers each learning from the other to push up their expectations of suppliers should be examined.
- Create an introduction agency to bring or business and the research community together to facilitate commercialisation of technologies
 - This might include an “audition day” for which local students and researchers rehearse and then present to their projects to businesses. The project would include mentoring before the presentation to ensure important points are covered and the superfluous stripped out. A systematic follow-up process is put in place to ensure leads and opportunities are pursued, and ideally, relationships across the business/research divide are fostered.

Further Opportunities

These sectors have been mentioned earlier as the foundations stones on which Western Australian can build global competitive advantage in the knowledge economy:

- Mining, Oil and Gas – exploration, project management, extraction, financing etc.
- Environment and Land care
- Delivery of government services
- Remote Products and Services; Building and fostering relationships, managing over distance

In addition there are other strengths which are already evident and which offer significant potential:

- Quality of Life management
- Recreation and specific sports
- Construction of high-speed ferries and boats

Create excitement, optimism and a sense of direction

Companies which are as dependent on innovation for their survival and development as Information and Communications Technology companies are face a constant challenge to attract and retain the highest quality staff. Far more than in other sectors the quality of their staff will determine their fate, particularly those that are competing globally.

Western Australia has an excellent record in developing highly talented individuals and in attracting many capable people to the State. Its ability to retain those with global level aspirations and abilities has probably never been so tested as it is today. The ever increasing mobility and fierce competition for global knowledge workers make this a major issue for any regional knowledge economy.

Many of the issues addressed under earlier strategic directions will contribute to building a sense of excitement, optimism and direction for Western Australia's Information and Communication Technology industry. Nonetheless this issue is undoubtedly important enough to justify a section of its own and the necessary support and monitoring this implies.

An ICT Industry Vision

A vision for the industry provides a gathering point, an articulation of the industry's position and where it intends to go. Without this being explicitly stated, and refined when necessary, it is unlikely that the synergies and cooperation that can be captured from the industry's players will ever be brought together.

A vision can be built by:

- Identifying the "burning platform" or pressing shared motivating issue for the industry, create a sense of urgency and then a sense of purpose
- Identifying where the industry has come from and where it wants to go and
- Developing challenging scenarios and the challenges and opportunities for each scenario.

From this it is possible to identify a vision for Western Australia as a global knowledge economy and promote it and sell this vision throughout the community.

It is essential that the vision is acted upon incisively and credibly. The vision and its supplementary goals should be linked to measurable outcomes and these should be used to develop a scorecard to indicate progress and to make it visible to the community

This process needs to be constantly updated to maintain its relevance and credibility with the industry and the wider community.

Realising the Vision

The strategic initiatives outlined here flow from the vision which has been proposed at the beginning of this section. The need to lift the profile of government leadership and the reorient industry direction, developing market-focussed clusters oriented to global business along with initiatives to improve the investment climate all contribute in a very real way to building a sense of excitement and focus.

Providing a clear direction, with the resources to back it, will offer ambitious ICT professionals a greater sense that Western Australia is an environment that is well suited as the location for them to realise their aspirations.

Making it visible

The fractured nature of the industry, both sectorally and geographically, makes building and sustaining a vision that can be shared by the entire Western Australian Information and Communications Technology industry a vital and challenging goal. This is made even more difficult when almost half of the ICT professionals in the State see themselves as being primarily part of their “client” industry rather than the ICT industry. It will require the development of a real industry community. Leadership is an essential part; which has been discussed already; as are communication, sharing knowledge and information and gathering together. None of this can be created from the top down, there

has to be a commitment and a will to make it happen, but elements can be put in place to encourage the desired outcomes.

- The establishment of a website which projects both beyond Western Australia and to a local audience.

The local sections contain timely strategic information and news which is applicable to Western Australian ICT SMX's business concerns. Those directed primarily off-shore are organised around the identified market-focussed clusters. Both are demand rather than supply driven

- Drive industry awards harder to achieve strategic industry development outcomes, use the results as a means to identify developing "hot-spots", add cache to them by linking with an international exchange or travel opportunity
- Engage the media, involve them in the vision, give them a place on the team
- Develop a regular watering hole for clusters and any other events to ensure the potential for every possible partnership is exploited...and keep the information flowing

Report successes

- Institute a "state of the industry" report which documents progress, create a scorecard of milestones set and achieved, identify the next milestone
- Produce case studies, engage universities to write case studies and report on industry development over time compared with best-in-the-world

Conclusion

This document has provided a summary of the survey of the Western Australian Information and Communication Technology industry and the international global scan of other industry development approaches by state and national governments. Working from this material and the input provided from industry representatives at a scenario planning workshop these strategic directions have been identified.

While the Western Australian ICT industry is, in common with ICT industries around the world, enjoying massive growth its potential is even greater. The fulfilment of this potential will be realised through locally-managed companies engaging with export markets. The domestic market is crucial to this but not as an end in itself. A series of directions and desired outcomes have been spelt out here.

The need to maintain an export focus and a demand-side bias in the development of initiatives has been reiterated a number of times through this document. These perspectives are both essential to achieve this potential, in our view. The overarching strategic initiatives, are to: create a global Information and Communication Technology business incubator; distinguish the Western Australian ICT industry; and to create excitement and optimism

These provide a framework in which program opportunities become clear. As with any successful industry development strategy they will require the active involvement of relevant industry sectors. In this industry, where many of the most experienced and successful are actively engaged in developing their businesses, a particularly innovative approach by policy-makers will be required to ensure their experience and insights are harnessed.

This document constitutes the completion of the first three elements to the inputs in the preparation of an Information and Communication industry development strategy for the State. The next phase – “the analysis of results and the development of programs” – will be undertaken by the Department of Commerce and Trade’s Office of Information and Communication. The OIC will also oversee industry consultation, the development of a final report and implementation of these programs.

Notes

¹ Source, WA GDP: Treasury Department, Government of WA, Western Australian Economic Summary, September Quarter 1998. For ICT Revenue: Appendix A, Research Solutions, ICT Industry Research Study, Jan 1999.

² This figure is for the Communication industry, the bulk of which is made up of ICT activity. The other major groupings are broadcasting and other media. This different system of categorising plus the 18 month difference in when the data was gathered accounts for the variation in the industries' values between the two tables.

³ Australian Bureau of Statistics, Catalogue No. 5220.0, Table 15.

⁴ ICTs are having some of their most significant effects in reducing transaction costs: the costs of buyers and sellers finding each other, finalising the transaction and delivering the product to the buyer. It has been suggested that in a physically isolated economy such as Western Australia's these costs are disproportionately high and so ICTs will have an even greater impact than elsewhere.

⁵ See "From Mines to Minds: Western Australia in the Global Information Economy", Western Australian Technology and Industry Advisory Council, February 1999.

⁶ The General Agreement on Tariffs and Trade and the World Trade Organisation

⁷ IDC January 7, 1999 Press release. <http://www.idc.com/Press/010799Apr.htm>

⁸ IDC January 7, 1999 Press release. <http://www.idc.com/Press/010799Apr.htm>

⁹ The Universal Service Obligation is the minimum standard of service that the industry is obliged to make available at a standard price to every customer.

¹⁰ Whilst these comments are generally critical of the telecommunications companies it should be pointed out that this pattern of heavy focus on the corporate sector and the major population centres is a commercially logical strategy and one that is replicated consistently in other deregulating markets.

Probably the major issue, particularly in Western Australia is the general lack of enterprise demonstrated by the industry at large. There are still relatively few examples of either existing companies or new start-ups pursuing niche telecommunications markets, beyond those mentioned.

¹¹ By international standards no WA-owned ICT company has grown beyond Small to Medium Enterprise size. This is not the drawback in has been with technologies enabling them to leverage far more from their resources than in the past and their greater flexibility often being a significant advantage in increasingly volatile markets.

But SMEs can be disadvantaged by a lack of resources, particularly in terms of marketing and delivering more complex solutions for clients. Marketing clusters can help alleviate both these weaknesses.

¹² This project, jointly supported by the Australian motor vehicle industry and the federal government, has brought together a wide range of component and other industry SMEs to design, develop and construct a vehicle made entirely from their products. The vehicle has since been travelling to trade shows and other major industry events around the world to lift the profile of Australian component manufacturers.

¹³ The term Multi National SMEs is not commonly used but in this context it refers to the growing capacity and reality that SMEs can and are operating globally (as with SMXs mentioned earlier). Carefully chosen companies from this group may be well suited to seek to attract to WA given the size and structure of the economy.