

SUBMISSION TO THE 2008 INNOVATION REVIEW TO CREATE AN INDEPENDENT ECONOMIC STUDIES INSTITUTE TO UNDERSTAND THE IMPACT OF ICT ACROSS THE AUSTRALIAN ECONOMY AND COMMUNITY

This submission is written to outline the contention of the Pearcey Foundation that it is time for Australia to create an independent ICT Economic Studies Institute (“ICTESI”) dedicated to the provision of information and knowledge on the role Information and Communications Technology (ICT) plays in innovation, productivity and the Australian economy. The rationale for the formation of this facility is taken from the introduction to the Call for Submissions itself, where the Committee responsible for the 2008 Review of the Innovation System, asks:

- How might we best focus our efforts for good outcomes for this nation in the decades ahead?
- How better can we support diffusion and take up of new technologies and innovative processes across industries and the community?

The ICTESI will assist all stakeholders understand the role of ICT in productivity and innovation and help focus strategies and activities for a better return on investment addressing ICT Domain expressed in Figure 1 below.

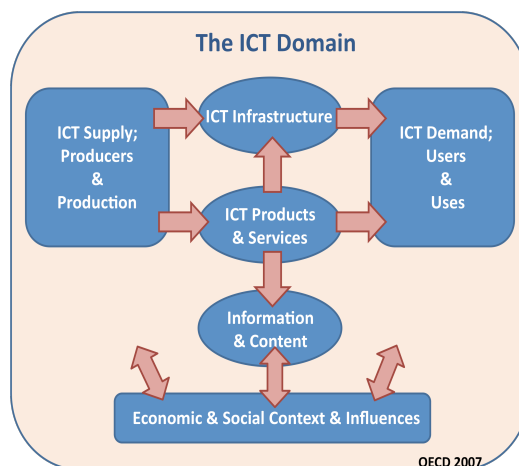


Figure 1: The ICT Domain

1 ICT CONTRIBUTION TO THE ECONOMY

It is widely recognised that ICT plays a major and pervasive role in the innovation process across all sections of this nation’s economy (and, for that matter, across any nation’s economy, including those of our competitors) as exemplified below:

- ICT can be considered to be analogous to electricity generation, or to road systems; ICT is pervasive and ICT investments facilitate efficiency. As obvious examples, significant economic

changes have resulted from the introduction of broadband, wireless technologies, miniaturisation and portability;

- Innovation is dependent upon human behaviours and here ICT is an essential ingredient as it underpins the way we do things. Again, obvious examples where significant changes have been enabled include consumer devices, internet-everywhere, user created content. ICT changes the way people work and live;
- All sectors of the economy have been impacted by the “paperless office” and “connected value chains”;
- ICT facilitates globalisation by permitting immediacy in the transportability of information and knowledge.

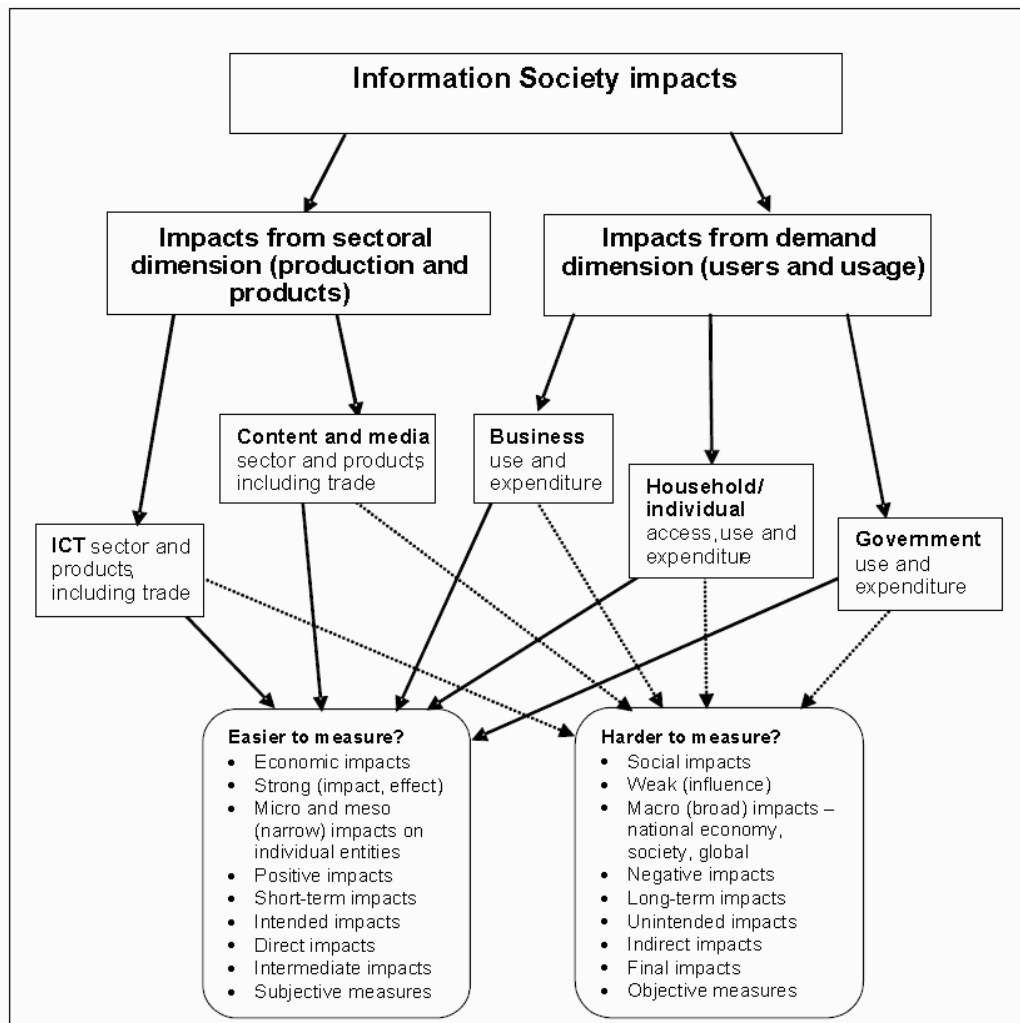


Figure 2. Information society impacts measurement model

As illustrated in Figure 2¹, defining, let alone measuring, the productivity impact of ICT is challenging. OECD data shows that in Australia the contribution of ICT to GDP averaged 0.915% per annum between 1995 and 2003, when the total productivity increase averaged 2.2%. In certain industry sectors ICT dominates as the single most important productivity measure. Another perspective,

¹ Information society impacts measurement model page 8, “Measuring the impacts of ICT using official Statistics DSTL.ICCP/IIS(2007)1

expressed by the ITU in 2006, is “You want to know the difference ICT makes?.....try to live without it...”²

The challenge when analysing the impact of ICT is multi-dimensional. Whilst not positioning this analysis as being in any way complete, one approach to understanding the role of ICT is to see the continuum of its role across the national economy as shown in Figure 3 below. This continuum can apply to many industries and services, but it serves to illustrate how ICT innovation occurs across the entire economy.

- The vertical known as the “ICT Sector” is identifiable using this representation yet it is difficult to define the sector’s boundaries precisely;
- The key role ICT either plays, or has the potential to play, across so many individual industries including other high technology sectors such as bio-tech, nano-tech, advanced manufacturing technologies etc., only serves to cloud the boundaries further;
- It is proposed in this submission that the ICTESI should be designed to understand the impact of ICT across the Australian economy. Therefore its role is to understand the impact of ICT innovation across the entire economy, not just in the ICT ‘industry’. Thus the scale of ICTESI’s purview should be as described below in Figure 3.

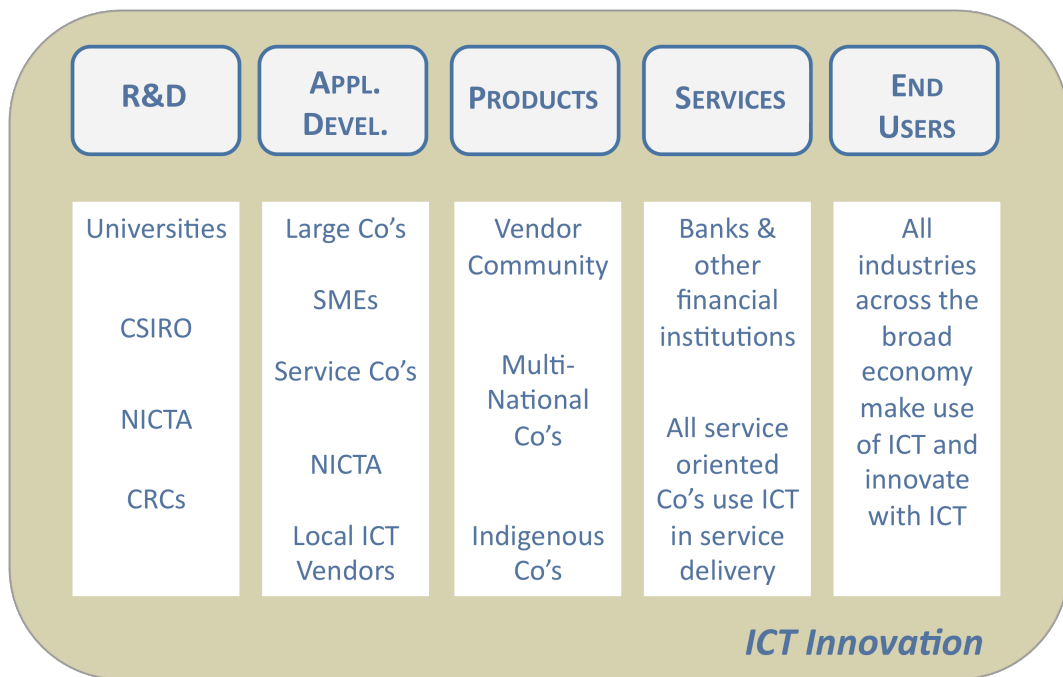


Figure 3. ICT Innovation occurs across the entire national economy³

² International Telecommunication Union (2006), *World Telecommunication: ICT Development Report (8th Edition)*: *Measuring ICT for Social and Economic Development*, Geneva.

³ ICT innovation model developed by the Pearcey Foundation

2 OVERVIEW OF THE ECONOMIC SIGNIFICANCE OF ICT IN AUSTRALIA

ICT is a major contributor to the Australian economy as illustrated by the data set out below, from a recent report published by the Australian Government Department of Broadband, Communications and the Digital Economy⁴.

- Total ICT spending in Australia in 2006 was forecast at just under US\$50 billion, making Australia the twelfth largest ICT market in the world, while being only ranked 52nd in the world by population;
- Australia is the fifth largest ICT market in the Asia-Pacific region, after Japan, China, Korea and India. The 24,000 ICT businesses in Australia generate revenues in excess of A\$80 billion;
- In 2004-05, total revenue in Australia from the production of ICT goods and services was \$84.4 billion consisting of ;
- ICT industries in Australia earned a total revenue of \$103.3 billion in 2004–05. ICT specialist firms accounted for 89.1 per cent of this total. Telecommunications services accounted for \$34.9 billion, computer wholesaling for \$20.7 billion and computer consultancy services for \$19.5 billion;
- In 2002-03, ICT gross domestic product (GDP) accounted for 4.6 per cent of Australia's total GDP. In relative terms, this places ICT alongside the Australian mining industry, and larger than the Australian agricultural sector or the whole of the Australian transport sector (*i.e.*, road transport and storage together with transport services and storage)⁵;
- Australia imported \$17 billion of ICT goods and exported \$2.17 billion in 2005-06;
- According to the Australian Bureau of Statistics (ABS) Labour Force Survey there were approximately 371, 150 people employed in ICT related positions in August 2006. Nearly 92 per cent of these people were employed full-time. Of this, males represented 84.5%;
- 19% of professional settlers arriving in Australia during 2004-05 were computing professionals;

Total ICT (R&D) expenditure in Australia is nearly \$3 billion per annum, accounting for approximately 25% of total gross expenditure on R&D. Organisations outside the ICT sector are responsible for more than half of all ICT R&D expenditure. These organisations are using ICT R&D to economically develop their businesses and to achieve other social, environmental and defence goals For example, ICT R&D accounts for 98% of the finance and insurance sector's R&D expenditure; ICT is a significant component of private sector R&D. It accounted for 36-43% of annual private sector R&D expenditure

⁴ See

http://www.dbcde.gov.au/communications_and_technology/publications_and_reports/2006/november/overview_of_the_australian_ict_industry

⁵ Source : ABS 52060, ABS 5259.0, CIER Industry sector contributions to Australian economy (Gross Value Add)

over the last three years⁶. In 2002-03 business accounted for 86% of total ICT R&D expenditure. The Australian Government accounted for 7% and the higher education sector 7%. 15% of public ICT R&D is focused on the development of new product offerings and services for the ICT business sector. The remaining 85% of public ICT R&D is focused on achieving other economic, defence, environmental and social goals.

The paradox here is that ICT, as an “industry” vertical or *stand-alone* sector, is relatively small, yet it is seen to be large across the national economy. How can this be? The reality is that the pervasiveness of the technology means that in a ‘services’ context for instance, ICT is indistinguishable with the actual service provided, i.e., they are one and the same thing, e.g., in the financial services sector, individual companies in this sector are totally dependent upon ICT in regard to their offerings to customers yet they do not portray themselves nor see themselves as ‘software’ companies. Expressed a different way, the ICT “industry” challenges conventional economic analysis because of its pervasive role.

The ICT industry is an industry that:

- Constantly transforms itself;
- Is innovative and creative;
- Drives major change in Australian industry and commerce - as measured by productivity improvements across the nation’s economy (as it does in most developing countries);
- Is Australia’s ‘coach’ effectively assisting its development into a knowledge-based society.

It is also well recognised that the Australian ICT sector remains diverse and fragmented. It can be characterised as follows:

- Large players (mostly multi-national, excluding the carriers) who are generating the bulk of revenues;
- Smaller companies (mostly indigenous) who are generating innovation and exports;
- A broad (and becoming broader) product spectrum from software and media content to electronics to electronics manufacturers;
- Telecommunications generating > 40% of the ICT industry’s revenues;
- Many industry stakeholders, with numerous industry associations, state & federal policy formation groups and research institutions.

3 WHY AN ICT ECONOMIC STUDIES INSTITUTE IS NEEDED

The ICTESI is needed for a number of interrelated reasons:

- to accelerate technology-enabled innovation and productivity in Australia in the longer term;
- to ensure Australia has a globally relevant ICT capability;
- to reduce Australia’s reliance on growth through primary industries and natural resources;
- to help ensure that the ICT sector can generate more strategic focus and better coordination across the many ICT industry sectors, the 15 or more Australian ICT industry bodies, the 10 or

⁶ Less than 16% of software development expenditure in the business sector is classified as business R&D and the share of software business R&D is around 7%. Most software and information system implementation work is not classified as R&D usually because it involves applying known software tools innovatively to solve problems, rather than to develop new software itself. .

so major state & federal government bodies and the many major research units who are the primary stakeholders of the ICT industry.

There has been a long history of reviews and reports in Australia by various ICT stakeholders, all of which have had somewhat limited strategic policy impact due to a lack of advocacy, understanding, interpretation and/or adoption.

One question that arises is how much, if at all, government policy should intervene in an endeavour to impact further upon the development of the Australian ICT industry. Does Australia need a long term strategic vision for ICT, such as has been created in South Korea, Malaysia, Finland, Singapore and Taiwan? This question has proven to be a somewhat controversial issue across the ICT community in Australia, and yet most industry leaders and stakeholders agree that more and better coordination is needed.

Public sector ICT procurement policies in Australia are often focussed on risk minimisation and lowest cost as well as on compliance with Free Trade Agreements (FTA's). This has had a negative impact on the development of the local ICT industry, and in particular on SME's, to invest in and commercialise innovation. The demise of the Partnership for Development program, linked to government procurement activity, has seen many multinationals close research operations in Australia. Improved measurement is needed to underpin better procurement policies and to understand their link to industry development.

In addition, the government grants and tax incentives made available to the industry (in particular the Commercial Ready and the R&D Tax programs), are very much appreciated, but these programs have failed to lift business investment in ICT-related R&D towards globally competitive levels. The support programs are too piecemeal and their impact is inadequately measured.

Thus, this submission is recommending that a non-political, rigorous, comprehensive information base and analysis capability is needed for the ICT industry to clarify these issues and maximise the industry potential and the nation's competitive position internationally.

By quantifying and measuring ICT's impact, the ICTESI will help develop understanding of how this nation can exploit ICT to its maximum advantage.

Through the ICTESI, a broader analytical capability for assessing the impact of ICT becomes available, and stakeholder support for common goals and common strategic initiatives, becomes significantly more achievable. As well, an unbiased comprehensive information base becomes established creating greater opportunities for industry and social advancement; the very essence of what the Innovation Review is about.

3.1 Comparable Models

Comparable models for the ICT Economics Studies Institute exist in other segments of the Australian economy:

- [Wine and Brandy Corporation](#);
- [Tourism Australia](#);
- [IPRIA](#) (Intellectual Property Research Institute of Australia);
- [ABARE](#) (Australian Bureau of Agricultural and Resource Economics);

- [BTRE](#) (Bureau of Transport and Regional Economics).

In each of these institutions, there is a government and/or industry funded research entity that is recognised as a source of current, comprehensive industry-specific information and analytic capability used by governments, industry, media and other stakeholders.

It is time this nation established an economics studies centre for research on Australian ICT that can be relied upon by all for unbiased, comprehensive, broadly based research, information and data provision on ICT across all aspects of this nation's economy.

3.2 Why another economics studies institute?

Firstly, Australia does not have an economics studies institute researching the impact of ICT in the community and society. What we have are research institutes undertaking technology research. This is NOT the remit of the proposed economic institute.

The role of this institute is not to compete with existing institutes for ICT R&D funding, rather its role is to become a repository of information and knowledge for government and industry so as to allow investment to be best directed. Its researchers and directors are not undertaking ICT R&D, they are analysing global and national trends in innovation and productivity. They are also providing a constructive commentary to all stakeholders on how best to facilitate a “smart Australia” underpinned by investments in technology.

It is noted however that many institutes have overlapping briefs with the proposed institute. Further to the development of a business plan (see “Initial Steps” section 5 below), it is essential an INCLUSIVE approach is taken that leverages the scattered, fragmented capability currently in Australia, and links to relevant global study groups. The proposed institute should follow a “hub and spoke” model, incorporating and leveraging capability in existence in other institutes.

Australia's has many ICT research groups, including CSIRO, NICTA, DSTO, various CRC's and many other University-based groups. However, our research groups suffer from a clear national vision and a coherence of strategy and meaning for the ICT community. They define their work programs to support interpretations of “National Research Priorities”, and operate in a (substantially) tactical “competitive bidding” approach to ensure funding is directed at the best opportunities. While such an approach has many advantages, it also leads to duplication of initiatives, gaps in Australia's capability and a misalignment with opportunity. The long term “Return on Investment” is therefore compromised. How do we know the money is best spent? How do we know it is invested to produce the best return?

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3.3 Proposed Model for the Institute

It is proposed the institute be co-located with a nationally recognised academic institution, leveraging the staff, infrastructure, relationship network, capability and reputation of that institution. Leading institutions in Australia would be invited to bid to become the host.

The institute will be non-political, bipartisan and supporting the needs of all stakeholders.

3.4 Role Of the Pearcey Institute in the Economics Institute

The Pearcey Foundation is a catalyst to the establishment of the institute. It does not seek to establish the institute itself and anticipates an elected, independent body drawn from a broad group of stakeholders to work through a tender process to establish the institute.

4 THE ICT ECONOMICS STUDIES INSTITUTE IN DETAIL

What follows is a (high level) practical description of how such an institute might operate and what could be the scope of its proposed undertakings. It is hoped that the Innovation Review committee will view this proposal as providing a very practical way of securing this nation's future in ICT.⁷

4.1 What will the ICT Economics Studies Institute do?

It is suggested that the institute might focus initially on four areas, as follows:

4.1.1 DATA COLLECTION⁸

To ensure that there is sufficient focus on the institute's efforts to generate valuable outcomes, it is imperative that all parties share a total understanding of the nation's current ICT capabilities and shortcomings, across the public and private sectors, as well as in industry and academia. It is contended here, that as a starting point, a total picture needs to be developed which describes Australia's ICT capabilities in detail from the bottom up. While, broadly speaking, a top-down view does exist today, it is only in statistical form. Given a full understanding of the current situation for the Australian ICT industry, the institute would then be positioned to suggest answers to key questions. For example, it could ask... "How will Australia, as a relatively small country, prioritise its innovation efforts to optimise outcomes in ICT?"

A sustained long-term data collection effort is proposed which is to be broadly focused on:

- a) Capturing enterprise data, including product capabilities, workforce and skills;
- b) Understanding the role of exports and imports including global linkages (i.e., building an understanding of the Australian ICT food chain);
- c) Geographic and sectoral mapping;
- d) Forecasting;
- e) Detailed mapping of what R&D is being undertaken by whom and where, and with what intended impact;
- f) Extracting value from the 180 (or so) prior studies undertaken on the ICT industry in Australia over the last four years;
- g) Identifying and assisting in data collection wherever gaps in information are identified;
- h) Assisting with international data collation and interpretation (eg with the OECD ICT Directorate).

4.1.2 MEASUREMENT

To ensure progress can be quantified, accurate measurement would need to be undertaken, covering at least the following:

⁷ While not a subject of this submission in any detail, it may also be of interest to the Innovation Review to consider how such structures might also be of value in other major Australian industries and capabilities.

⁸ In all cases, it is intended that the institute would exploit all existing repositories and ensure that duplication of effort is avoided, wherever practical.

- a) Interstate, National as well as International benchmarking;
- b) Measurement of the level of enablement provided by ICT in other industries, including healthcare, education, energy & resources, environment, entertainment, manufacturing, transport, financial services, primary industries, government services and other industries;
- c) Progress against industry targets (annual, tri-annual, 5 year, etc).

4.1.3 ANALYSIS AND RESEARCH

Research staff at the Institute would also undertake collaborative analysis and research based on the captured industry data and information, including such activities as understanding and publicizing:

- a) National and International trends and business climate-related issues;
- b) Industry performance and competitiveness;
- c) Cross-sectoral issues;
- d) Providing potential Policy Options, along with associated opportunity and risk analysis;
- e) Skill needs and forecasting, gender issues, etc.;
- f) Exploring research priorities and ICT infrastructure needs for deployment;
- g) Economic and other ICT industry analysis of trading partners and competitor nations.

4.1.4 SERVICING OF CLIENT NEEDS

In time, it is suggested that the ICTESI would become the established and universally recognised source of information and skilled knowledge on the Australian ICT industry. Once this is the case, clients will logically include:

- a) Governments (Federal, State, and local);
- b) Industry Associations (both within the ICT sector and without);
- c) Media;
- d) Educators and researchers, including 'education' of federal, state and local policy makers on drivers of the knowledge economy and in order to assist in new and informed policy generation;
- e) Australian Investors and Corporations;
- f) ICT professionals, managers, end-users;
- g) International customers and investors.

Additionally, but within the limits of maintaining an unbiased, independent position across the ICT industry, the institute might also undertake limited assignments on a contracted basis. The institute will also publish regular and ad hoc reports, all of which might materially assist the institute to become more financially independent over time.

4.2 Critical success factors for the ICTESI

Most observers of the ICT industry are well aware of many earlier enquiries and surveys, of past and existing investments in various economics research institutes and in centres of excellence, etc., all associated with ICT. However, the proponents contend that what is being proposed here differs significantly from all of these previous endeavours. Critical success factors include the following:

1. This proposal represents a fully inclusive approach. It is one that will exploit all existing capabilities and initiatives fully and to suggest policy alternatives, wherever ICT is involved.
2. The ICTESI should be established not only as an independent centre, but also as one linked closely to one (or more) academic institution(s), thus embracing all those who are already

prominent and competent in the field, and then drawing them together more closely under the auspices of the institute.

3. The institute's exact form be decided by a body of individuals drawn from the industry (government, academia, industry groups, as well as some industrialists), who are best suited to make this determination.
4. Strong support from ICT industry leaders, industry associations and governments at all levels, and particularly from the many departments within the Federal Government who have various interests in the future of ICT. State government departments will also be key to ensuring the success of this initiative. In particular, it is hoped that this proposal will be one that binds interested parties together, and certainly that it will not be one that further splinters them.
5. This proposal must not be viewed as a threat to any ICT group, sector or individual. It is important that the Institute is able to embrace all interested parties and vested interests from the outset. The institute must be outward looking and able to generate support for the industry through measuring and proposing approaches that can maximize ICT's enabling impact across Australia's diverse and sophisticated economy.

4.3 Characterisation of the ICT Economics Studies Institute

Desired Features

- The inspirational leader of the institute will be a full time professional who is committed to implementation of the institute's vision, as defined by a board of highly respected ICT notables;
- There will be small executive group reporting to the leader;
- At the heart of the institute, there will be a lead group of researchers spanning economics, business, law, technologies, and, over time, PhD student researchers;
- Whilst the home base for the ICTESI will most likely be an east coast academic institution, there is no perceived need that all of the institute's staff would be centrally located. The concept proposed here involves connection through the institute to the best researchers in the business, regardless of their physical locality, i.e., a distributed telecommuting organisation;
- The economics studies institute will seek to exploit all existing areas of available expertise. It will embrace and include areas of competence already recognised across the Australian ICT community, be they at any particular University, in an existing federal or state government department, or in a private economics studies institute (such as the CIER, or another industry body), the ABS, or the Productivity Commission;
- Over time, a measure of the institute's success will be the level to which it becomes recognised as the national unifying policy forum for ICT and all of its constituent elements.

Mandatory features

- The board controlling and directing the ICT Economics studies institute must be truly independent and have no real or perceived vested interests outside this field of endeavour;
- The research methodologies and processes followed by the institute must be academically rigorous, of high quality, and be transparent;
- The institute should have close linkages with all appropriate international peer bodies;
- The institute will have close working relationships with Australian ICT industry groups, including the ACS, AIIA, AIG (AEEMA), NICTIA, NICTA, CSIRO IT, as well as with appropriate State and Federal government agencies and departments;

- A key goal of this institute must be to ensure that it is viewed, over the long haul, as the definitive source for ICT industry information and knowledge.

4.4 Funding the ICTESI

It is not evident to the proponents how this ICT Economics Studies Institute might be made self-funding from the outset. However, once established, the institute may become self-funding, at least to some degree. For example, it could “sell” certain results of its work. It should be noted though, that it will be critical that any objective for long term self reliance will have to be counterbalanced by the fundamental requirement that the institute remains able to provide (and be perceived to provide) a fully independent and balanced view.

Therefore, it is proposed that the Federal Government should consider the provision of seed funding as follows:

- \$100,000 funding in 2008 for a detailed feasibility study and development of a business plan for the institute.
- \$5m in seed funding from 2009 onwards, subject to an agreed three-year business plan. The Federal Government may wish to see this support complemented by additional funding, sourced from other founding-stakeholders.

5 INITIAL STEPS TO CREATE THE ICT ECONOMICS STUDIES INSTITUTE

The proponents believe that four basic steps will be needed to bring the institute into existence:

1. Secure broad interest and agreement with this proposal across government bodies, i.e., Federal Government Departments including Industry and Communications, key State Government departments, especially in Victoria, NSW and Queensland (but, hopefully, in all states), major ICT industry groups, ICT Advisory Council, Online and Communications Council, as well as NICTA and CSIRO IT;
2. Secure an initial funding commitment from the federal government for a feasibility study;
3. Establishment of an interim committee that seeks competitive bids from leading research institutions in Australia for the formation of the institute;
4. Federal Government support for the competitive bid process winner, at least over the first three years of operation.

This submission was conceived and prepared by members of the Pearcey Foundation including the following: Wayne Fitzsimmons, Phil McCrea, Len Rust, Charles Lindop, David Merson, Bill Caelli, Rick Harvey, Phil Singleton(deceased) and Greg Smith.