.au

Australia

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Total population	20, 264, 082 (July 2006 estimate)
GDP	USD 612.8 billion (2005 estimate)
Key economic sectors by contribution to GDP	Agriculture (3.8 per cent), Industry (26.2 per cent), Services (70 per cent) (2004 estimate)
Computers per 100 inhabitants	72 (2006 estimate)
Fixed line telephones per 100 inhabitants	57 (2005)
Mobile phone subscribers per 100 inhabitants	91 (2005)
Internet users per 100 inhabitants	72 (2006)
Domain names registered under .au	5, 351, 622 (2005)
Broadband subscribers per 100 inhabitants	28 (2005)
Internet domestic bandwidth	up to 24Mbps (depending on exchange and telco)
Internet international bandwidth	365 Gbps (actual)/1560 Gbps (potential) (2006)

Sources: CIA 2006; ABS 2005a; Computer Industry Almanac 2006; TIAC 2006; Braue 2006.

Technology infrastructure

Australians are reluctantly realizing that, unlike South Koreans, they do not have a world-class digital technology infrastructure. This has been spelled out to them in three ways. First, Kim Beazley, leader of the opposition Labour Party, pledged that a future Labor government would deliver a 'high-speed, fibre-to-node broadband network across the country' (Beazley 2006), which implies that Australians are lagging behind. Second, the recently privatized Australian telecommunications giant Telstra, has just announced that it will not be proceeding with the proposed Aus$4 billion super-fast infrastructure to connect consumers in major cities because of the regulatory conditions associated with the on-selling of access to competitors. Third, Australian media have found that a 650MB DivX movie file would take 105 minutes to download in Australia, but only one minute in South Korea, using average broadband speeds (Jenkins & Colley 2006, p. 8). Most Australians still use dial-up access.

On the other hand, Australians in urban environments are generally well-connected, with 91 mobile phone subscribers per 100 inhabitants, and 57 per cent of them with domestic access to fixed phone lines. Access to the Internet for most Australians is made possible by a high-speed network to a telephone exchange and then copper cable for the local loop connection from the telephone exchange to their homes. This means that the distance between the home and the exchange can become critical in terms of final Internet speed delivered. While this wire-based infrastructure has many limitations, the costs of using wireless technologies to deliver domestic broadband services in Australia

are thought to outweigh the benefits (LeMay 2005). None of the telecommunications players has committed to building fibre optic networks, and people living in remote, rural and regional areas generally have fewer choices and higher communication costs than city-dwellers.

The 2005 Australian Bureau of Statistics (ABS) report (ABS 2005b) notes that 67 per cent of 15, 500 households surveyed had a computer at home while 56 per cent had domestic access to the Internet (69 per cent of those with dial-up Internet access and 28 per cent with broadband connections). The figures suggest that over the period 1998–2005, the rate of take-up has slowed down slightly, which would impact on the adoption of new services such as VoIP. More information on internet usage in Australia is likely to emerge from the 2006 national census which includes, for the first time, a question about Internet access. The first findings are to be released in 2007.

Key institutions dealing with ICTs

The production and consumption of ICT goods and services are vital functions of Australia's commercial and industrial sector. According to the most recent information available, at the end of June 2003 there were more than 25,500 Australian businesses classified within the ICT industry grouping, with a total income of almost Aus$90 million and employing over 2,35,000 people (ABS 2004).

Since ICTs are deemed important to Australian productivity and prosperity, all three levels of government – Federal, state

and local – are deeply involved in ICT policy and development. Regulation is at a Federal level (Australia-wide) but policies promoting 'Smart States' and aiming to attract inward ICT investment are enthusiastically enacted at the level of states and territories (of which there are eight). These often compete among themselves to entice digital companies to their capital city or Technology Park.[1] Local government – at the level of the Shire, Town or City – is responsible for services such as libraries and community centres, which often provide ICT access to users who may not have domestic-based facilities. The Federal government also funds ICTs for the armed forces and for homeland security initiatives. These expenses are rarely open to scrutiny but constitute an important component of the ICT research and development programme.

While there is no specific government organization tasked with the development and regulation of ICT industries, the Federal Department of Communications, Information Technology and the Arts (see section on ICT industries, below) deals with enabling policies. The Australian Competition and Consumer Council (ACCC 2006) and the Australian Communications and Media Authority (ACMA 2006) are given responsibility for regulating ICT industries and for ensuring that competitors are given access to the once-publicly-owned Telstra network fairly and at competitive on-selling rates.

Digital content initiatives

Australia's majority language is English, which means that much of the world's digital content is highly accessible to Australian citizens. However, Australian policy makers and digital content providers worry about the huge impact of US-generated digital content on Australian citizens, particularly on Australian children. The Federal government believes it is important that Australians have access to Australian-produced content that deals with matters that are relevant to Australian audiences. The Australian Film Commission's Policy and Research website carries a range of government and other reports and speeches dealing with the importance of having Australian-developed content for new media (AFC 2006). However, as noted earlier, Australia has not invested sufficiently in its telecommunications infrastructure to enable the majority of its citizens to participate in an online interactive streaming media environment.

Australia's premier arts funding body, the Australia Council for the Arts (Ozco 2006), used to have a New Media Arts Board to encourage innovative Australian content production in new media. This board was disbanded in 2005 following ongoing controversy and friction with the Howard government and its

ministers over a Aus\$25,000 (2003) grant to artists seeking to develop a video game entitled *Escape from Woomera*, apparently referring to the immigration detention centre deep in the South Australian desert that has now been closed and relocated to the nearby Baxter detention centre (Google 2006). New media arts applications these days are predominantly assessed by either the Visual Arts or the Music Boards, and there are very few opportunities for funding Australian new media products if developers cannot attract commercial backing.

In addition to being mainly-English speaking, Australia is a nation built on immigration and it prides itself on its cultural and linguistic diversity. But some sections of society have been accused of discrimination (such as surfaced in the 2005 Cronulla riots). Some Australian Muslims feel marginalizsed by the post 9/11 environment and the increasingly intrusive legal and surveillance attempts to prevent the possibility of 'home-grown terrorism'. Australia also attracts regular criticism from overseas about its failure to keep its obligations under the 1951 UN Refugee Convention. Nevertheless, Australian media are comparatively inclusive and there is a digital content regime that enables the nationwide, government-funded Special Broadcasting Service (SBS) broadcaster to develop expertise in translating over 60 languages, with 68 languages broadcast on SBS radio and available for podcast downloads. Non-English speakers outside Australia might find some SBS (2006) online material interesting and accessible. The broadcaster keeps alive positive views of Australian multi-culturalism, such as those contained in the 2006 report *Connecting diversity: paradoxes of multicultural Australia* (Ang et al. 2006).

The cultures of Australia's indigenous people are supported through a variety of online initiatives. In addition to the Australian government's Indigenous Portal (http://www.indigenous.gov.au/), there is the online newspaper *National Indigenous Times* (http://www.nit.com.au), specialist indigenous web design and cyber services (such as http://www.Cyberdreaming.com.au), and online initiatives such as Digital Songlines (http://songlines.interactiondesign.com.au/), which aims to promote 'the collection, education and sharing of Indigenous cultural heritage knowledge'.

Online services

As with all countries that have a significant land mass and a scattered population outside the major cities, the relative degree of accessibility of websites and other ICT services for remote and rural residents is a highly political issue in Australia. As the government and commercial service providers invest more

heavily on online services, access and infrastructure, they also cut back on accessible face-to-face services. Thus, the proportion of the population that finds it difficult to access online information also have increasing difficulty accessing services that were once delivered in a variety of modes. For example, many consumers who are unable to use online banking are charged heavy fees for face-to-face transactions in an environment where, many bank branches have been closed and there are fewer cashiers.

Online services are provided by all levels of Australian government. Government websites contain links to other websites with authoritative materials that complement or add to core government services. Communications, education, health and security are specialist Commonwealth government areas with online resources that may be of interest to people in the wider Asia Pacific region. The website of the Australian Broadcasting Corporation (http://www.abc.net.au/), Australia's primary public service broadcaster, is a gateway to a large amount of information on a wide variety of subjects.

The Federal government's education website (http://www.education.gov.au/) is a gateway to over 5,000 websites concerning education and training in Australia, as well as a range of policy documents and a site for educational policy makers. The educational spectrum is covered – from early childhood education through to higher education – and diverse subjects are included. The portal can also be used to access state-specific education websites.

Educational institutions increasingly expect students to engage fully in multi-mode flexible delivery models of education. Some universities, for example, require students to submit their essays digitally so that they can be checked for online plagiarism (i.e. the use of online resources without crediting the original source of the comment or idea) via software such as Turnitin.com. Blackboard, which bought out rival WebCT at the start of 2006, provides the online infrastructure and tools for many of Australia's higher education institutions. Whether the subject is Shakespeare or Internet studies, students are expected to use high-level digital tools. Moreover, schools, universities and education departments increasingly deliver information via the Web to their respective communities of interest. Students enrol in courses online, find their exam marks online, and pay fees and fines using secure online websites.

There are many interesting heath-related online services. One is the Australian National University's MoodGYM (http://moodgym.anu.edu.au/), which provides, free of charge, self-paced, self-instructional, online materials teaching cognitive behaviour techniques for the prevention and reduction of anxiety and depression. The Department of Health and Aging website (http://www.health.gov.au/) offers access to a variety of interesting topics and its search function links to a large range of reliable independent resources about matters of international relevance, such as bird flu and HIV/AIDS.

Australia has a dedicated portal for national security issues – the Australian National Security website (http://www.nationalsecurity.gov.au/). This keeps interested Australians (and civil liberties and human rights lawyers) up to speed on the government's views about potential threats to national security. Taking a bigger picture, the Australian travel advisory and consular assistance website, (http://www.smartraveller.gov.au/) offers guidance on the perceived safety of Australians travelling to other countries and regions. Australians are encouraged to register their travel plans on this site so that they can be contacted quickly in case of a natural disaster, civil disturbance or family emergency (DFAT 2006). The online service has been credited with helping the government organize the evacuation of Australian citizens from Lebanon in mid-2006.

ICT and ICT-related industries

Australia operates a trade deficit in terms of ICT goods and services (ABS 2004). Effectively, Australia does not have a consumer-based ICT hardware manufacturing industry with a global presence. ICT goods and services, while extensive, can sometimes be compromised by a regulatory environment which (arguably) gives too much power to industry players who work to maintain the status quo. For example, the existing commercial television services stated, at the start of digital broadcasting, that they would only invest in the necessary technological infrastructure if they were guaranteed that no new commercial free-to-air (FTA) television licenses would be issued. Although the moratorium on new licenses ended in 2006, it has held back the development of the industry, and discussions around the further development of digital television broadcasting continue (see below).

The Department of Communications, Information Technology and the Arts (DCITA) has a website dedicated to broadcasting and online regulation (http://www.dcita.gov.au/broad) which details Australia's policy responses to the evolving ICT environment. A recent DCITA report (April 2006) characterizes the Australian software industry as 'globally competitive, domestically undervalued'. The implication is that Australia has decided not to participate in ICT hardware industries but, is keen to be recognized for a growing influence in the global software arena. In particular, the Australian computer games industry has been identified as a key focus for future development.[2]

Enabling policies and programmes

The Connect Australia initiative is driven by DCITA as part of the government's undertakings to provide telecommunications services to remote, regional and rural areas that are of the same quality as services enjoyed in the cities. However, although significant amounts of money (partly from the 1999 sale of 16 per cent of the government-owned telecommunications company, Telstra) have been invested in this project, rural services are generally not as good and are more expensive than those available to city dwellers.

A 2001 government project, *Backing Australia's Ability* (BAA), started with an 'Innovation action plan'. In 2004 this was extended to include 'Building our future through science and innovation', and funding and timelines were increased so that a total Aus$8.3 billion commitment is extended over the 2001–2011 period. The BAA project focuses on three main areas: the generation of new ideas (research and development), the commercial application of ideas, and developing and retaining skills. Although key performance indicators (and progress against these) are not readily accessible, four reviews of government-funded research have been undertaken. The government has provided its response to the key recommendations arising out of three of these reviews (DEST 2006).

The Federal commitment to fostering innovation goes hand in hand with a state-based initiative to promote the creative industries, particularly centred upon 'Queensland – The Smart State'. Queensland's strategy, timeline 2005–2015, aims to communicate and develop a vision of Queensland as a place where 'knowledge, creativity and innovation drive economic growth to improve prosperity and quality of life'. Implicitly, the policy uses the income from the current resources boom to fund investment in environmentally and culturally sustainable creative industries that have the potential to drive future wealth creation via the development of a knowledge economy (Queensland 2005). Performance highlights for Queensland's Smart State Strategy focus on investment, economic growth, and rising skills levels (Queensland 2006).

Legal and regulatory environment for ICTs

The legal and regulatory environment for ICT and media industries in Australia is undergoing significant change and uncertainty. The Federal government has forecast and implemented a number of policy changes that impact on these industries, including changes to the 'Cross-media ownership laws' which used to restrict the range of media that could be owned by any one media company. According to then Prime Minister Paul Keating, an organization had to decide whether it wanted to be 'a prince of print' or 'a queen of the screen': in those days it could not be both. In July 2006, Senator Helen Coonan, the Communications Minister, announced further ICT and media reforms. In the main, these lift restrictions on cross-media and foreign media ownership, making it easier for foreign companies to enter the Australian market. They also allow an even smaller number of companies to own more of Australia's media.

These changes follow a raft of other reforms. In July 2005, ACMA assumed the combined responsibilities of the Australian Broadcasting Authority (ABA) and the Australian Communications Authority (ACA) as the chief regulatory body for media and communications industries and providers. The ACMA (2006) website covers subjects currently on the communications and media agenda in Australia, and their archives offer access to a range of deliberations and outcomes. Australia tends to operate a 'light touch' regulatory regime in these areas. Industry players set up codes of conduct (self-regulation) which may be discussed and amended prior to lodgement and registration. After that, the regulator is mainly interested in responding to complaints only if the complainant has evidence that an industry player has breached their code of conduct. Critics argue that the imbalance of power between an industry player and a consumer means that legitimate concerns may not get a fair hearing.

Questions remain over the power and effectiveness of ACMA, and its huge area of responsibility. On the infrastructure side, the Australian telecommunications industry is dominated by Telstra, which some have suggested is 'too big to be regulated' (ABC 2004) and which is also subject to regulation via competition legislation (ACCC 2006). On the content side, the long-held policy preference for self-regulation of media industries continues to cast ACMA in a relatively ineffective role.

These changes have not heralded a vibrant marketplace for local digital content. While existing digital television broadcasters are now able to offer more programming variety by the lifting of a requirement to simulcast content on standard definition (SD) and high definition (HD) channels, critics have noted that because all digital TV channels are currently operated by existing analogue TV providers, there is little incentive for the development of innovative and attractive new content offerings. Channels would undermine their own market and fragment their audiences by developing such competition to existing services. This regulatory environment is likely to further delay the switch to digital television broadcasting by Australian audiences (Coonan has already revised the analogue TV switch-off date

The privatization of Telstra: Deregulation, re-regulation or a total mess?

Australia's once-monopoly telecommunications provider Telstra, had a responsibility to provide a minimum standard of telecommunications services to all citizens. Being the only communications carrier made it possible for Telstra to charge more for highly profitable services, such as the provision of communications services to inner city locations, so that they could cross-subsidize very unprofitable services, such as those for remote and outback Australia.

With the 1996 election of a conservative federal government (the Liberal-National Coalition), the scene was set for a radical redrawing of telecommunications policy. There was one problem – the conservative parties in Australia are traditionally well-supported in rural areas and rural voters suspected that a privatized Telstra would give up rural services. In a competitive environment it would be difficult for city profits to balance losses in the rural areas. The government promised that Telstra would be governed by legal obligations to keep providing services to the bush. It also set up a regulation regime to make sure that Telstra was not unfairly charging small competitors to use its networks, which had originally been built with public funding.

This bargaining between the Australian government and rural inhabitants allowed for the sale of one-third of Telstra in 1997 – the T1 float – and for the introduction of competition between a range of telecommunications and Internet service providers. Some of the money earned was earmarked for improving regional and remote services. By 1999, the value of Telstra shares had tripled and the government wanted to sell its remaining stake. However, it did not control the Senate which insisted that Telstra remain majority government-owned. A further 16.6 per cent of Telstra – T2 – was sold off. In the face of criticism from non-metro consumers, much of the capital from T2 was used to 'future proof' rural telecommunications services.

The Howard government had to wait until it controlled the Senate to get permission to sell all of Telstra. By mid-2005, with Senate control finally achieved, the Telstra CEO Ziggy Switkowski had been replaced by Solomon Trujillo. The relationship between the corporation and the government quickly became fraught, with Telstra saying it was over-regulated and would not invest in new networks if the regulator was going to insist on 'unrealistic' rates of return. Meanwhile, the government criticized the company for 'talking down' the share price, as the T2 issue had more than halved in value. Shareholders, on the other hand, accused the government of withholding market-sensitive information that would have informed buy/sell decisions had it been widely available. The Australian government clearly had a conflict of interest in its various roles of legislator, shareholder and regulator. Prime Minister John Howard said, Telstra's 'half-privatised' status made no more sense than the concept of being 'half-pregnant'.

While Telstra board members continue to complain that the regulatory regime prevents them from maximizing shareholder equity, the government suggests that these problems were solved in late 2006, when the Telstra T3 float saw over 80 per cent of the company finally devolved into private ownership. About 17 per cent of Telstra's shares were not taken up by the market and these have been lodged in a 'future fund' set up to finance the unfunded pension costs of Australia's federal civil servants. These shares will be sold down in future years. Some commentators claim that this cache allows the government to continue its influence at arm's length. Accusations of interference were strengthened just before the T3 sale with the controversial appointment of Prime Minister John Howard's policy advisor Mr Geoffrey Cousins to the Telstra Board, achieved only through the government's use of its then-majority share-holding. The conflict seems set to continue.

from 2008 to as late as 2012). In the meantime, Australian TV audiences may continue to explore digital content alternatives on the Internet.

Copyright Law

The Australia-US Free Trade Agreement (AUSFTA), which came into effect on 1 January 2005, impacts on the ICT sector especially through the requirement to harmonize copyright laws between Australia and the United States. While both countries are said to be equal partners in this agreement, there are significant concerns that Australia will now be required to 'import' US legal frameworks. These may impact on the copyright legislation, and on the legislation governing related rights such as moral rights and access rights. In the realm of copyright, Australia will be required to extend its term of copyright to the US standard

of 70 years after the author's death. Commentators object that this may stifle the ability of authors and inventors to build on the work of their forebears. They specifically argue that the provision mainly benefits the US content industries (such as Hollywood), limiting Australian opportunities to compete on an equal footing. There are also concerns over whether the Australian rights to the use of copyright material, for example for the purpose of fair dealing, will be maintained when these are configured quite differently under the US law.

Furthermore, the US uses copyright law to defend technological protection measures (TPMs, such as region coding in DVDs, or anti-copying systems for other media forms). An importation of such legal approaches into Australian law could put Australian copyright law at odds with other applicable laws, such as those governing access rights. In the context of DVD region coding and elsewhere, US content industries have been accused of utilizing TPMs to control markets and stifle competition rather than simply to prevent unauthorised copying. This may directly impact on Australian consumers' access to products as the Australian market is likely to be seen by US companies as a region of lesser importance.

The outcome of the legislative processes surrounding the AUSFTA remains unclear, and is a matter of some concern to Australian media producers. A cross-party parliamentary committee published a highly critical report from its *Inquiry into Technological Protection Measures (TPM) Exceptions*, explicitly stressing the importance of maintaining 'the balance between copyright owners and copyright users achieved by the *Copyright Act* 1968' (House Committee 2006, p. 17). The committee noted a number of areas where exceptions from copyright enforcement should be ensured. (See Australian Copyright Council, http://www.copyright.org.au, for ongoing coverage of these developments.)

The future legality of the ways users get around TPMs for the purposes of time- and place-shifting of their media consumption (for example, by copying content to mobile devices) are of key importance in this context. It is also uncertain whether the provision of devices that circumvent TPMs is legal in Australia. An opportunity for a court decision on such matters was lost when the case against Sherman Networks, provider of the peer-to-peer (p2p) filesharing software Kazaa, was settled out of court in July 2006. Observers had hoped that a precedent in this case would have helped spell out the circumstances and conditions under which tools such as Kazaa could be legally used in Australia.

Open source and open content

As in many other countries, alternatives to copyright models continue to spread in Australia. Creative commons licences have been translated into the Australian legal context by the iCommons.au group (http://www.creativecommons.org.au/), a member of the international iCommons project. Creative Commons Australia (CC-AU), based at Queensland University of Technology, now organizes further research and advocacy around the creative commons project.

Creative commons and other open content licences are widely used. For example, AEShareNet is a company established by the Australian State and Territory ministers for education and training, which provides shareable learning and teaching materials under its own licence scheme. This includes licences such as 'Free for Education', 'Unlocked Content', 'Share and Return' and 'Preserve Integrity'. Based on a collaborative framework, the licenses involve a large number of universities and other educational providers. Australian Creative Resources Online (ACRO) is a repository for audio, video and still images content that is made available under both AEShareNet and creative commons licences. ACRO's mission is to provide source materials especially for amateur and grassroots content creators, as well as to study the creative work that draws upon this resource.

However, not all institutions in the Australian creative industries are predisposed towards the creative commons approach. In a widely publicized case in 2005, the Media and Entertainment Arts Alliance (MEAA), the union of workers in the media industries, argued strongly against its members' participation in a 'remixable' short film project by MOD Films (2005) that was to be released under a creative commons licence (APC 2005). With support from the Australian Film Commission (AFC), a government-sponsored body, the film was eventually shot in March 2005. Even so, MEAA, which exercises considerable influence in the film and television sector, has not revised its position on creative commons-licensed projects.

Education and research & development

The Australian higher education system is in a state of flux, which poses certain challenges to ICT-related research. Key to the government's new policy of measuring the quality and impact of publicly-funded Australian research is the Research Quality Framework (RQF) to be introduced in 2009, following data collection in 2008. Critics of the RQF model (such as the National Tertiary Education Union) argue that the assessment

An Australian creative commons

Creative commons licensing schemes have become a widely accepted alternative to traditional copyright licences. They offer copyright holders the opportunity to open up particular forms of use that otherwise would be denied without explicit permission. A range of licences is available (variously combining restrictions such as the attribution of the original author; limiting use to non-commercial purposes; denying the right to create derivative works; or requiring the sharing of derivative works under an identical licence scheme). Such licences exist in three forms: a human-readable version, a machine-readable version, and a 'lawyer-readable' version that spells out licence requirements and restrictions in legally binding language.

This last version must be translated into applicable legal frameworks for each country in which the licence is to be used. The project of translating this legal licence code into local frameworks is coordinated by the global iCommons group. (In 2006, some 32 national translations were in existence, with another 10 in progress.) Strictly speaking, it is possible that creative commons licences may not be binding in national jurisdictions not covered by one of these translations.

The Australian versions of the creative commons licences were developed by the Creative Commons Australia group based at Queensland University of Technology, and launched in 2005 at the Open Content Licensing Conference in Brisbane. The development team included staff from the university's Law School as well as lawyers from the Blake Dawson Waldron legal firm. Creative Commons Australia now continues to maintain the Australian licence legal terms. This is an ongoing responsibility as Australian copyright law continues to evolve and as the overall creative commons licences themselves mature further. The group also advocates in favour of a broad adoption of the licences by private and public institutions.

Creative commons licences were already widely used for Australian content even before the development of an Australian-law version of the legal licensing code. However, the availability of this translated licence ensures the legally binding nature of these licences in Australian jurisdictions, and provides further peace of mind for individuals and organizations wishing to use such licences. As a result, government and educational institutions in particular have adopted these licensing options, thus contributing significantly to the development of an intellectual and creative commons in the country. Further, such developments are likely to gain momentum as the Creative Commons group's Science Commons project (and potentially a Business Commons project) gathers speed.

panel system may result in a small group of experts dictating national research priorities, which may undermine experimental and esoteric research. This may be particularly problematic in the field of ICT-related research where investigators experiment with new and emerging technologies.

Under then Education Minister Brendan Nelson (replaced in 2006), there was considerable concern about the independence of the RQF, as well as of the Australia Research Council (ARC), the key national body administering competitive research grants. In 2005, Nelson had vetoed a number of 'controversial' grant projects even after they had passed the ARC's rigorous peer review process, which is designed to protect researchers from government interference. Such concerns have eased under the new Education Minister, Julie Bishop, who has promised not to repeat the ministerial interventions. Even so, the impact of Brendan Nelson's actions continues to raise questions about the independence of Australian research funding agencies.

Less controversially, the Carrick Institute for Teaching and Learning in Higher Education was launched in August 2004 and has been widely welcomed for its quality-improvement agenda. It has outlined 'innovation in learning and teaching, especially in relation to new technologies' as a priority area for its competitive grants scheme, and has provided a significant amount of funding to innovative teaching projects using ICTs (Carrick 2006).

Australian government research funding schemes encourage universities to cooperate with industry players, with industry partners providing a significant proportion of the resources. Among the key education-related research bodies in ICT fields are the Smart Internet CRC (Cooperative Research Centre), the Australasian CRC for Interaction Design (ACID), and the ARC Centre of Excellence for Creative Industries and Innovation (CCi). Launched in 2001, the Smart Internet CRC is a joint venture between government organizations, key universities, and industry partners. It published its major report, *Smart Internet 2010*, in August 2005 and has since released a number of updates dealing specifically with open source and social networks (see http://smartinternet.com.au/).

ACID is a similarly constituted body in the field of inter-action design, working with major partners in industry. Its research programmes cover areas such as Smart Living, Digital Media, Multi-User Environments and Virtual Heritage. Of particular importance are its projects working with Indigenous Australian communities (see discussion above), and with town planners and housing developers to establish smart suburban communities (see http://acid.net.au).

In 2005, the Federal government part-funded the ARC Centre of Excellence for Creative Industries and Innovation (CCi) costing Aus$10 million. It is based in Queensland with a range of associated organizations and researchers from around Australia (CCi 2005). It is the first such ARC Centre outside the science, technology, engineering and medicine (STEM) sector – which highlights an increasing government focus on the creative industries as a major contributor to the national economy. There are six research programmes investigated by CCi, including the citizen-consumer, crisis in innovation, creative workforce, and legal and regulatory impasses and innovations.

The establishment of this centre also points to a wider trend in Australia's engagement with ICTs: the continuing embedding of ICTs as tools of everyday life rather than as a separate technological category. This development is also indicated in current undergraduate enrolment trends in Australian universities, which have seen a marked decline in traditional, strongly discipline-based ICT courses in favour of combined, interdisciplinary double degrees pairing business, law, creative industries, humanities, or arts with ICT degrees (Rood 2004). IT faculties at a number of Australian universities have been drastically downsized in the process, while IT education finds its way into a variety of other degree options (Dreyfus 2006).

Australia and the region

Finally, Australia's complicated relationship with its neighbors impacts on its ability to engage in ICT-related projects in the region, including collaboration for ICT-related purposes with regional practitioners, scholars and students. On a political level, Australia's relationships with its neighbouring countries have become increasingly difficult following Australia's decision to join the 'Coalition of the Willing' and go to war in Iraq. The widespread perception in Asia Pacific of the Australian government as the neighborhood 'deputy sheriff' of the US has soured relations with a number of countries. While police and military interventions were welcomed by locals in troubled nations such as Timor-Leste and the Solomon Islands, for example, they also generated significant regional opposition which may limit Australia's ability to involve itself in ICT4D projects in the region.

On the other hand, Australia continues to welcome China and India as current and growing trading and political partners, and Australian industry, researchers and governments are strongly involved with both countries on all levels. This is true especially for ICT4D projects, where Australian researchers are working closely with UNESCO and other world bodies in developing locally-based solutions to ICT challenges. Such projects include work on promoting digital storytelling (Tacchi 2006) as a means of generating local content and developing ICT skills in local (and especially rural and underprivileged) populations, and the development of community-based local and regional multimedia centres (UNESCO 2006) to boost ICT literacy and information access (Tacchi et al. 2003a). In particular, ICT4D projects are also seen as a crucial component in the fight against poverty (Slater & Tacchi 2004). A core research tool in this context is ethnographic action research (EAR), a research methodology developed by Australian and British researchers in collaboration with south and central Asian participants and UNESCO (Tacchi et al. 2003b). Beyond this, Australia has also become an important exporter of creative industries theory and policy, especially to regional economic leaders such as China and India, where a creative industries approach is seen as an important longer-term strategy beyond the current boom in manufacturing industries. Australian researchers have been instrumental in raising awareness about this approach in the region.[3]

Notes

1. Insofar as they are regulated, Technology Parks are the responsibility of state and local governments. An example is Western Australia's Technology Park at Bentley near Perth (see http://www.techparkwa.org.au/index.shtml).

2. See for example http://www.cultureandrecreation.gov.au/articles/digitalgames/http://www.gdaa.com.au/; http://www.mmv.vic.gov.au/Games http://www.aph.gov.au/house/committee/cita/film/subs/sub078.pdf http://www.queenslandgames.com.au/

3. See especially Special Issue No. 9.3 (2006) on 'Creative Industries and Innovation in China' of the *International Journal of Cultural Studies*. Moreover, it is important to note that on 5–7 July 2007, Queensland University of Technology will host the 2007 China Media Centre Conference. See http://cea.cci.edu.au/.

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