



ICT enabling e-Research and Online Collaboration

*Dr Rod Badger, Deputy Secretary,
Strategy & Content*



ICT and transformation

- ICT is radically improving our capacity to collect, analyse, utilise, distribute and exchange information.
- ICT transforms industries/sectors and organisations by:
 - improving operational efficiency
 - enabling product and service innovation
 - enabling new business models.



The Information Economy and ICT

- ICT is becoming the most important infrastructure in the global economy.
- It is becoming embedded across all sectors of the economy and within the day to day processes of industry, government, academia and the community.
- ICT will become fundamental to all organisational activities and eventually, all commerce will have an online component.



DCITA research into the impacts of ICT

- The investigations undertaken by the DCITA at a macro-economic level confirms that ICT capability and diffusion is critical to the achievement of the Government's goals in a range of areas and that policies to promote innovation therefore need to recognize the importance of ICT in enabling productivity growth and economic and social transformation.



DCITA research into the impacts of ICTcontinued....

- 2004: *Productivity Growth in Australian Manufacturing*, found that ICT has contributed between 56 and 80 percent of productivity growth in manufacturing over the last two decades.
- 2005: *Productivity Growth in Service Industries*, found that ICT has contributed between 59 and 78 percent of productivity growth in the services sector over the last two decades.
- 2006: *Forecasting Productivity Growth 2004 to 2024* suggests that ICT will remain the main technological driver of productivity growth in Australia over the next 20 years.



The emerging e-Research paradigm

- Next step is to capitalise on this investment in ICT – to ensure effective use of networks and to maximise the social and economic returns to Australian society.
- e-Research is an emerging example of effective use of investment in ICT networks.



e-Research definition

- e-Research is the term increasingly used to describe new, very large scale (although equally applicable to smaller projects) research projects which are being made possible for the first time through developments in communications technology.
- These combine the potential of ICT systems with multi-disciplinary collaboration among researchers distributed geographically.



How ICT is enabling e-Research

- The increasing potentiality of ICT to underpin the emergence of new e-research methodologies has come as a result from increasing access to:
 - *Big pipe* broadband communications networks, research instruments and facilities, sensor networks and data repositories;
 - Software and infrastructure services that enable secure connectivity and interoperability;
 - Application tools that encompass discipline-specific tools and interaction tools.



Some potential gains from e-Research

- Economic benefits in key sectors of the Australian economy.
- Creation of new skills and know-how.
- Improved access to knowledge and information.
- The ability to work seamlessly.
- Advances rather than replaces traditional research methodologies.



International developments

- The UK and the US governments and the European Commission have all put in place programmes to encourage their research communities to exploit e-Research, investing heavily in research infrastructure and developing e-Research skills and tools to facilitate more productive use of the infrastructure and realise benefits from international collaborative research.
- We believe the UK's e-Science Programme, in particular, is a suitable model for Australia to imitate. We believe that it is important for us not to be left behind.



The UK experience

- The UK e-Science programme, announced in November 2000, aimed to:
 - Provide the infrastructure and facilities needed for the next major stages of international collaborative research;
 - Contribute to the emergence of next-generation open-platform standards for global information utilities;
 - Solve major challenges in processing, communication, and storage of very large volumes of data;
 - Provide generic solutions to the needs of individual disciplines and applications; and
 - Facilitate the sharing of international infrastructure.



The Australian Government's response to international developments

- In 2004, the Government recognised that a cohesive and coordinated approach to accelerate the uptake of e-Research was needed if Australia's research strengths were to remain internationally relevant and competitive.
- As a result on 19 September 2004, in *Information Technology: Connecting an Innovative Australia*, the Government made an election commitment to implement a coordinating structure for e-Research, modelled on the UK e-Science Programme.



e-Research Coordinating Committee

- Appointed on 21 April 2005 by the Minister for Communications, Information Technology and the Arts and the Minister for Education, Science and Training, the e-Research Coordinating Committee serves primarily as an expert advisory group and consists of e-Research experts and key stakeholders.
- The objectives of the e-Research Coordinating Committee are to:
 - Engage stakeholder groups in the identification of key policy issues and strategic directions in developing a national e-Research agenda;
 - Recommend to the Australian Government an overarching strategic policy framework and implementation strategy.



Progress to date

- In December 2005, an interim report of the e-Research Coordinating Committee was accepted by the Government as the basis for further work to develop an e-Research implementation strategy.
- A further report on the implementation of the e-Research Strategy to accelerate the development of Australia's e-Research capabilities has been finalised and we expect it to go to our respective Ministers shortly.



Issues explored in the adoption of e-Research in Australia

- The need for leadership and coordination;
- Fostering engagement and consensus building;
- Development and deployment of ICT solutions for e-Research;
- Skills acquisition;
- Support for researchers through a national e-Research Centre;
- Access, authentication and authorisation;
- Support for the e-Research fabric;
- Data management and accessible databases; and
- Coordination of effort.



E-research elements are already appearing in Australia

- Existing investments in advanced high speed networks underpinning collaborative research.
- National Collaborative Research Infrastructure Strategy (NCRIS).
- Prime Minister's Science Engineering and Innovation Council (PMSEIC) Data for Science Working Party.
- National Broadband Strategy (NBS).
- Next Generation of Broadband - Broadband Blueprint.



Existing investment in high speed networks

- Current Australian investments in systemic infrastructure, such as high speed networks (including AREN), the Advanced Networks Program, distributed high performance computing (APAC), the ARIC initiatives and investment in major physical infrastructure through the MNRF program and other funding programs, have placed Australia in a position to support e-Research activities which are comparable, and in certain aspects in advance, of that existing in other countries.



National Collaborative Research Infrastructure Strategy (NCRIS)

- In 2004, the National Research Infrastructure Taskforce recommended a set of principles and a national process to identify, prioritise and fund research infrastructure needs.
- In the 2004-5 budget, as part of the *Backing Australia's Ability: Building Our Future through Science and Innovation* package, the Australian Government announced that the National Collaborative Research Infrastructure Strategy (NCRIS) would be implemented to provide the greater focus and coordination required.
 - A key capability: Platforms for Collaboration



PMSEIC Data for Science Working Party

- Recently, the Prime Minister's Science Engineering and Innovation Council (PMSEIC) has convened a data working group to examine issues surrounding the establishment of an Australian Virtual Repository for scientific information.



National Broadband Strategy (NBS)

- The rollout and effective use of broadband technologies is crucial to Australia's future prosperity and will provide significant economic and social benefits to the Australian community.
- The National Broadband Strategy (NBS) has been developed to coordinate activities across government and to provide a holistic approach to broadband development in Australia with a view to achieving long-term strategic outcomes.
 - The National Communications Fund (NCF) and the Co-ordinated Communications Infrastructure Fund (CCIF) and the Advanced Networks Program have contributed to the rollout of significant new broadband infrastructure to deliver essential services in regional Australia.



Clever Networks

- The **Clever Networks** program, part of the \$1.1 billion **Connect Australia** package, has funding of \$113 million to support the development and roll-out of new broadband infrastructure, networks and innovative applications to improve the delivery of health, education and other essential services in regional, rural and remote areas.
- Clever Networks aims to identify areas which are underserved by higher bandwidth infrastructure and to leverage investment from industry and governments at all levels and work actively with local communities to improve broadband infrastructure and services in those areas.
 - Clever Networks will build upon the successes of the CCIF and DAB programs with a significant increase in funding to extend coverage and stimulate innovative uses of broadband in the delivery of services in regional, rural and remote Australia.



Next Generation of Broadband - Broadband Blueprint

- In May 2006 The Minister announced the development of a Broadband Blueprint. The Blueprint provides an opportunity to reinvigorate Australia's Broadband Agenda at a critical time.
- The Federal and State and Territory governments already have a track record of collaboration in broad band development and the development of the Broadband Blueprint offers an opportunity to build on this existing foundation.
- To this end the Blueprint will build on the National Broadband Strategy which.
 - The blueprint will ensure that the roll out of next generation broadband is coordinated across jurisdictions with clearly delineated roles for State, Territory and Local governments that meet the needs of end users.



The Way Forward

- However, building an Australia e-Research capability is not only about ICT infrastructure.
- The coordination of the relevant capacities and the governance arrangements that regulate access, authentication, privacy, intellectual property ownership, standards, and data base management are equally important. These issues parallel DCITA's broader e-transformation concerns.