NICTA Submission to the NSW Digital Economy Action Plan

Dear Industry Taskforce

NICTA thanks the NSW Government and the Taskforce for the opportunity to provide input into the development of the NSW Digital Economy Action Plan.

The issues paper comprehensively covers the range of topics relevant to the development of the Digital Economy. We would also like to underline some of the key drivers to consider in developing the plan and suggest projects and areas which we think are potential opportunities for NSW.

Overview

We are in midst of a generational change in the way our economy operates with several interconnected trends impacting us simultaneously.

Over the next decade the economy will need to re-organise itself to take advantage of the increasingly compelling power and utility of mobile devices and new opportunities presented through the use of cloud computing. To take advantage of this, we need skilled people who know how to provide services relevant to the cloud and get benefit out of the cloud. We will also need to train or attract large numbers of people who know how to optimise delivery of services and content over the mobile devices that are increasingly becoming our primary form of interacting with the digital world. To gain the full benefit of this transformation also means that the NSW public need to be aware of the capabilities of new technology and can engage with it.

Alongside this transformation is the now potent ability of computers to draw insight from vast amounts of data and to help us optimise the use of precious physical resources like transport networks, energy and water\(^1\). This insight can be used as input to planning, in real-time to better manage traffic and safety, to predict problems, to understand the bottlenecks in the health system, or to generally increase productivity.

NSW is well-placed to take advantage of these trends with examples of world-leading practice in many areas. The task before us to encourage us to move as much of the NSW economy into the digital realm as possible so as to take advantage of the benefits possible as this occurs.

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\(^1\) NICTA Smart Infrastructure Discussion Paper, November 2009
Education

Education is a key area of opportunity for NSW. We have a globally significant education sector not only servicing NSW, but exporting high value educational services. If we combine this strength with our highly-developed content industries, and take advantage of the new opportunities available from digital and broadband technologies, we can set the pace in this sector. This is especially true as we move towards a national curriculum.

NICTA and CSIRO through the Australian Centre for Broadband Innovation (ACBI) and the Department of Education and Communities have been developing a digital education collaboration around the use of immersive learning environments as a way of providing an online class where students in different locations can interact and share their personal experiences, and collaborate in shared learning. This approach would support aggregation of students from different locations and address the dual issue of small student cohort numbers in regional schools limiting access a diverse curriculum. It also addresses the issue of a shortage of specialist teachers in regional areas limiting access to subjects such as Maths extension, Physics, Chemistry and Asian language courses. In a state and federal context, this initiative also supports the Commonwealth and State Ministers Declaration on Educational goals for young Australians (November 2008) which committed to action for all young Australians to achieve “not only equality of opportunity but also more equitable outcomes.”

A potential subject area currently being scoped for a trial include a language such as Mandarin – which has recently been confirmed and announced as being a key language under the new national curriculum.

Development of an interactive game to support the learning of a language curriculum is also being scoped as part of this project. As Sydney is particularly well-endowed with creative content making community around digital media, such a component could be developed as a natural entertaining platform and extension to the program.

Immersive environments and other innovative online delivery services will also be of particular use for children with disabilities living outside of metropolitan areas– for example: providing broad access to specialist speech pathology services. The current model for delivering these services throughout NSW is characterised by limited access to speech pathologists in regional and remote areas, and high-costs. Such a trial could potentially demonstrate a better way of delivering these services and at the same time deliver significant productivity savings for the state and nation.

A Potential Market for Educational Services

Additionally, because the immersive learning platform needs to be run over a broadband network, students can be located anywhere in the world, so the concept could also be a potential export channel for educational services.

This raises the issue of whether there should be marketplace for online educational content and services developed in NSW. Australia has not yet developed such a marketplace despite its natural capabilities and the funds spent on digital content initiatives through the Curriculum Corporation and other peak educational groups over recent years.

In the UK, initiatives such as the London Grid for Learning and NESTA3 have all funded the development of educational content and services from a variety of groups including teachers, universities and, importantly, independent companies. These processes are designed to promote innovation in learning and how students use and interact with educational content and each other. In Australia, there has not been the same focus on separate funding of such innovation and new services (although the State Government’s Curriculum and Learning Innovation Centre4 (with its limited resources) does a great job.

There is therefore a current opportunity to creating an effective marketplace for online educational content and services that could improve educational outcomes, as well as create jobs and potential export for Australian companies. There are already some innovative Australian companies such as Clickview, 3P Learning, Roar, etc in this space but there is great potential for expansion.

Media and Entertainment Services

Sydney is generally regarded as Australia’s media capital – with Australia’s major media enterprises based here. Media and entertainment are also at the forefront of much of the online services innovation revolution. Gordon Bell, principal researcher at Microsoft recently described the ‘Killer app” of the NBN as most likely to be TV and US Video on Demand Service provider Netflix now accounts for as much as 1/3 of all broadband traffic on the US internet5.

The Digital Economy presents strategic opportunities for Australian companies in a variety of areas where there are existing strengths in NSW including:

- mobile applications and gaming,
- animation and visual effects
- location-based gaming and event services
- interactive advertising and
- broadband audio-visual services and technology

It would be therefore useful if the Action Plan seeks to build on these existing foundations. For example, given the strong ecosystem it would make sense to encourage globally focussed media and entertainment-focussed start-ups in NSW.

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3 www.nesta.org.au
4 click.det.nsw.edu.au
5 Sandvine Study, October 2011
Financial Services

Australia’s Banking and Financial services sector has been quick to embrace the benefits of online services. Many of the customer-facing services - such as the award-winning Commonwealth Bank iPhone Augmented Reality Property Guide application - are world class.

Our major retail banks and financial services companies: Commonwealth Bank, Westpac, AMP, Macquarie are amongst the largest employers in the NSW Digital Economy.

In addition to this, there is a growing range of high-value export focussed online financial services and technology companies that are leaders in their field such as the global market surveillance software leader – Smarts Group which was recently sold to Nasdaq OMX.

It would therefore be useful if the Action Plan seeks to build on these existing foundations.

Ports

NSW ports are both the critical gateway for the state’s most important supply chains, and a bottleneck limiting economic growth. Unlocking opportunities to improve port operations and multi-modal capabilities is dependent on data and ICT, as much as it is reliant on strong policy initiatives for long-term planning and clear governance. Solving the flow of goods through Port Botany, and congestion in the Botany – Kingsford Smith precinct has been well-identified. Equally, realising an increased share of container traffic movements by rail – (currently 18% from Port Botany) has been tabled as a key component enabling faster growth without impacting road congestion.

A first step would be to work with Transport for NSW on logistics – in particular, the specific opportunities of demand-matching and flow of goods in the Port Botany, using ICT to increase the efficiency of operations and improve productivity for the NSW economy.

Transport and open data

NSW has considerable challenges facing its transport infrastructure, but it is also a pioneer in intelligent transport systems, especially applied to managing road congestion. This is global challenge, and by BTRE estimates avoidable road congestion is costing Sydney alone $5.1 billion a year in 2011 and this will likely exceed $7.7 billion a year by 2020. More powerful techniques in optimisation, machine learning, video analysis, data fusion and data collection mean we have an excellent opportunity in NSW to take a world-leading role in this area. Intelligent transport system technologies allow significant performance improvements to be made in existing road infrastructure without the need for capital works by applying better algorithms and making use of more data, for example from computer video analysis of traffic.

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To understand the size of the potential benefit, improving avoidable congestion only 10% would save $500m a year drag on Gross State product (GSP) at current levels, rising to $770m a year on year by 2020, based on the referenced BTRE figure. The cost of deploying such technology is very small compared to the cost of building more roads and the benefits to GSP.

The first step in realising this kind of benefit would be to develop a pilot in a heavily congested area within Sydney applying advanced ICT to the problem. By measuring the improvements in performance we can then develop cost-benefit models to justify broader implementation.

Utilising NICTA’s proven capability in Intelligent Fleet Logistics – applying algorithms to manage massive numbers of real world constraints in ways which can be computed in near-real time – could position NSW among the first to communicate freight routes optimised for either travel time, distance travelled or carbon emissions released. A first step here would be for NICTA to work with RMS to evaluate the potential positive impact of such an approach on major freight corridors.

Related to this is an opportunity to make much better use of existing transport data generally. NSW has made substantial progress in this area recently, but more can be done. Applications such as MyBus which tells users the shortest path to the right bus give us a glimpse of what is possible. The more timely the data that is available in an actionable form - meaning it can be read easily by computers over the Internet - the more we will be able to provide useful services for the travelling public.

One could imagine a simple service which provides a metric on how congested key chokes points like the Sydney Harbour Bridge are in real time. It could be as simply expressed as green, orange or red (blocked) or provide more detailed information like estimated travel times. Such an application could help people decide to travel at different times or choose public transport over a private vehicle. More broadly, if the data currently collected by government agencies across all kinds of areas were in actionable form, the research community could use powerful computational techniques to gain insight into how to better run our state and plan for the future.

**Government Services**

Digital technology is also important for government. A project NICTA is exploring with ACBI is an e-Gov tele-kiosk which will be able to offer a service equivalent to going in person to a government agency such as the RMS. It will allow a remote operator to interact with the client and deal remotely with paper forms, identification and other services which often require a highly skilled government customer contact staff member to meet a citizen in

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8 NICTA Submission on the 2011 Strategic Roadmap for Australian Research Infrastructure Exposure Draft, July 2011.
person. Such a technology would allow better matching of staff to client needs, allow better pooling of resources and reduce the amount of travel for those in remote and regional NSW.

Increasingly, government services will need to be delivered on mobile platforms. Recent experience in the UK has shown this to be an effective method for delivering government services, even to the less-privileged.

Such ideas could be part of a broader program, perhaps supported through a government services innovation laboratory located at the Australian Technology Park.

NICTA, November 24, 2011.

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