



The Value of Infrastructure

Welcome to the Infonomics Letter for February 2011.

It's just four weeks since I penned the last Infonomics Letter. How remarkable have been the events of these past four weeks. Through the power of communications infrastructure we know as the Internet and applications built on top of that infrastructure such as facebook, twitter and you tube, we have seen in real time and at close quarters the remarkably peaceful move to regime change in Egypt, the rather more traumatic but nonetheless profound wave of change sweeping Libya, and the heartbreaking devastation in Christchurch, New Zealand.

Just over ten years ago, I used dial up internet access to download and watch a few seconds of grainy video showing an airliner ploughing into the World Trade Centre. Twenty two years ago, when the Berlin Wall fell, our access to information was limited to the newspapers and television. In half a working lifetime, or just a single generation, the way in which we access news has changed immeasurably.

The enabler to this change has unquestionably been the advent of high speed digital communications. But the communications infrastructure alone is insufficient for us to access the information we seek, or sometimes don't even know exists. In order to access the information we need the complementary technologies for capturing, packaging and presenting it, and the applications that manage its storage, accessibility and delivery, along with myriad other functionality.

Thus one can argue that infrastructure itself has no direct value. Its value can only be accessed and realised when there are appropriate complementary technologies and applications through which the latent value is made real.

These are the thoughts that underpin my submission today, albeit at the last minute, to an inquiry by the Australian Parliament's Standing Committee on Infrastructure and Communications into the role and potential of the National Broadband Network. Essentially, I argue that the NBN itself will deliver no tangible value – but that its massive latent value can only be unlocked by appropriate development and deployment of complementary technologies and applications. Driving value from Australia's NBN therefore demands effective governance arrangements to encourage and focus investment in these resources. I'd like to share that submission with you as this month's Infonomics Letter.

Mark Toomey

25 February 2011

Infonomics Submission: Inquiry into the role and potential of the National Broadband Network

Infonomics Pty Ltd, an innovative Australian company promoting effective governance of information technology on the global stage, is pleased to present this submission to the Inquiry into the role and potential of the National Broadband Network.

Structure of this submission

Infonomics believes that realisation of the full value of the NBN investment requires a sound long term approach to governing its development and use. The relevant framework for guiding this governance is AS/ISO/IEC 38500.

This submission is structured in three sections:

- **Governing the NBN: Overview**
In this section we position AS/ISO/IEC 38500 as the appropriate high level guidance for governance of the NBN, where governance must address the achievement of value through use of the infrastructure as well as effective supply of the infrastructure;
- **Governing the NBN: Context for realisation of value**
In this section we establish a strong distinction between the supply aspects of the NBN, which create the potential for value, and the demand (or usage) aspects of the NBN through which the potential is realised.
- **Governing the NBN: Principles**
In this section we discuss the application of the guiding principles in AS/ISO/IEC 38500 to the governance of the NBN.

Governing the NBN: Overview

Governance of the NBN

Neither successful deployment of the NBN, nor realisation of the potential value of the NBN will come by accident or through a laissez faire approach to governance. Active, informed and effective direction and control are essential to ensure that the building of the infrastructure is complemented by development of diverse commercial, public and social applications that exploit the capabilities in the infrastructure to deliver tangible value to the nation.

Infonomics regards this inquiry as a vital first step in establishing appropriate and effective governance of the NBN. In its terms of reference, the inquiry already alludes to a range of applications that may emerge. However, there is an immense gap between identifying the possibilities and delivering the reality,

and it is this program of actualisation to which substantial ongoing government energy must be applied. There is also an immense gap between the readily identifiable first fruits of this infrastructure investment and the outcomes that may be delivered as a result of further technology evolution and the ingenuity of individuals who may conceive applications that have never before been contemplated. To understand this point, consider for example the freeway network in the United States, originally designed and built as a national defence initiative, but now clearly recognised as a major enabler of US economic growth through the last half of the 20th century. Similarly, Internet services such as twitter and facebook are far beyond the imaginings of those who designed and built the first generation of the Internet. In a third example, the Bessemer Process breakthrough in steel making late in the 19th century did not so much reduce the price of steel as it did enable a vast increase in the volume of steel available, opening the door to greatly increased manufacturing and the development of skyscraper construction technologies.

It is imperative that while governance of the NBN encourage its use as an enabler of advances in the disciplines identified in this inquiry's terms of reference, the governance arrangements also persistently and consistently encourage, with appropriate control, the further development of complementary technologies that exploit the underlying power of the NBN, together with applications, commercial models and other deployment arrangements that will produce value beyond what is presently conceived.

Relevant Framework

AS/ISO/IEC 38500:2008 is the international standard for Governance of Information Technology. This standard was originally developed in Australia as AS 8015:2005 and adopted by ISO and the IEC in a fast-track process during 2007. The principal authors of both standards are Australians. The undersigned author of this submission is the project editor and principal custodian of the international standard.

AS/ISO/IEC 38500 is designed to give guidance to organisations of all kinds and sizes on effective governance of information technology, with the objective of ensuring that use of information technology is effective, efficient and acceptable.

Intrinsic to the guidance in AS/ISO/IEC 38500 is the distinction between the notions of use (also referred to as demand for) of, and supply of information technology. The model for governance of IT presented in the standard exhorts leaders in organisations to:

- Evaluate the current and proposed future use of information technology, from both demand and

supply perspectives, across the entire business cycle;

- Direct the current and future use of information technology through development and application of policy, controlled allocation of resources and undertaking of specific planned initiatives;
- Monitor the organisation's use of IT with particular emphasis on achievement of well-defined performance objectives and conformance to clearly defined and relevant rules.

AS/ISO/IEC 38500 also presents six guiding principles for effective governance of IT. These are discussed in the body of this submission.

Applicability of AS/ISO/IEC 38500

Because it is deliberately designed to apply to all organisations, AS/ISO/IEC 38500 is equally applicable to the nation as an overall organisation as it is to individual companies, agencies, charities and other organisations which use information technology. Infonomics has previously demonstrated that AS/ISO/IEC 38500 provides very relevant guidance on directing and controlling the use of IT in a domestic setting (See [The Infonomics Letter, March 2010 Edition](#)).

In the context of the NBN, the Federal Government is the governing body which carries the obligation to ensure that the investment in the NBN is efficient, effective and acceptable. Australian government agencies, businesses of all types and individuals make up the overall organisation (the nation) for which the governing body (the Government) must evaluate options and proposals, provide appropriate direction, and monitor outcomes.

Governing the NBN: Context for realization of value

The NBN is Information Technology Infrastructure

A broadband network alone is nothing more and nothing less than expensive, but useless and valueless infrastructure. It can be likened to the current millions of kilometres of copper telephone cable and telephone exchanges across the nation with no telephone service providers. Although we push the limits of the physics that bound the capability of the copper communications network, the only way that economic value is derived from that network is through the opening of access during the latter part of the 20th century, so that innovators could exploit its underlying capability to carry voice, data and image from one place to another through the development of scale and complementary technologies. Indeed, the Internet as we know it today is one of the key complementary technologies that exploited the current copper communications network, and

arguably is the advance that has now pushed the copper network to the limit of its potential.

Taken as infrastructure alone, the NBN can never be regarded as producing any return on investment. But when considered as the essential enabler to an unimaginable array of capabilities that can be devised on the back of a ubiquitous, reliable, high bandwidth communications infrastructure, the potential economic benefit is immense.

Infrastructure, without appropriate use and context, is useless and valueless.

Imagine a world-class sea port constructed on the banks of the Todd River in Alice Springs. Alice Springs is more than 1000 km from the nearest coast and the Todd River is dry most of the time. It is easy to understand that such a port has no value, regardless of cost.

Now consider a rail link between Adelaide and Darwin. Indeed this link does exist: construction was completed in September 2003, at a cost of \$1.2 billion. However, it was not until January 2004 that the first freight was transported along the line, due to inadequate establishment of the business apparatus which would enable it to be utilised.

Years later, the failure to concurrently develop the complementary infrastructure and business means that the Adelaide to Darwin line is severely under-utilised and incapable of delivering what should have been a significant benefit not only in freight costs but also in greenhouse emissions. In 2010 it was sold to an offshore investor for approximately one quarter of its original cost.

Clearly, it is essential that the Australian government fosters, from the outset, appropriate use of the NBN. Waiting until the NBN is deployed is too late – industry planning for exploitation of its capabilities must begin now.

Infrastructure, its use and value are easily confused

A bustling airport can and often is seen as a thriving, vibrant business. But take away the aeroplanes and the lustre rapidly disappears leaving behind a worthless husk of unused facilities. While many airports market themselves as “destinations”, their grim reality is that their existence depends entirely on the viability of airlines that use the airport infrastructure.

A leading business figure (*Michael G. Porter, director of research and policy for the Committee for Economic Development of Australia*) commenting on the NBN in *The Australian* on 11 August 2010. He said: “*I TOO would like a Ferrari, but why should it be subsidised by the government*”. He went on to acknowledge that the NBN will provide a “*high-speed information highway across Australia*”. What Mr

Porter did in this case was confuse the infrastructure with its use. To compare like concepts, Mr Porter should have discussed a six-lane freeway instead of a Ferrari. It’s a pity because he could have made a very powerful point: infrastructure by its very nature is a long term investment which must be targeted to current and likely future need. It must also be adaptable to diverse use and circumstance. A six lane freeway linking two small outback towns would be unlikely to ever deliver a return on investment. On the other hand, continued failure by a succession of Australian federal and state governments to develop suitable road infrastructure in Australia’s busiest transport corridors has resulted in immense social and economic cost. Yet where investment has been made, utilisation of the improvements has generally followed and substantial economic benefits have accrued.

There is no value in the NBN. However, there is immense value potential that can be unlocked only through creation of the NBN. The Australian Government and industry must develop a more rational dialogue in which the supply of the NBN infrastructure is clearly distinguished from the use of that infrastructure to realise value, and the cost-benefit equation must be balanced by consideration of the NBN not merely as a replacement for the current infrastructure, but as an enabler for future complementary technology and applications.

Common, ubiquitous infrastructure is essential

It is difficult to imagine Australia with even the internet and general communications capability of today without the long-established copper communications infrastructure that is presently in place. While now predominantly held by a listed public company, the fact remains that the vast majority of this infrastructure was initially developed as a government owned monopoly. Had Australia evolved with multiple infrastructure providers, it is highly likely that incompatibilities would have limited system growth, that proprietary interests would have stifled competition, and that economic considerations would have limited penetration to higher population areas. This is, after all, precisely what has happened with mobile telecommunications and is a natural outcome of a market driven by purely market forces. It is only through the application of some regulatory control that Australia does enjoy a moderate level of transparency and interoperability among mobile providers, but it is also through an abject failure of such regulatory control that we see high levels of mobile communications supply in densely populated areas and virtually no mobile access in sparse population areas.

The NBN cannot be considered to be a suitable investment for market driven control. If it were to be left in the private sector, there can be no doubt that it

would focus on and exacerbate the existing Australian problem of excessive population clustering in cities, and that unnecessary duplication of infrastructure by competing providers would tie up financial resources that should be better allocated to innovation that exploits the infrastructure.

Ultimately, as can be found foretold in many works of science fiction, Australia and the entire world are rapidly evolving to a situation where any individual, virtually anywhere, can access a wide range of information based services. This will always require a well-designed mix of "hard" infrastructure such as the fibre, complemented by "soft" infrastructure such as wireless. Some of the conceivable outcomes of a ubiquitous communications infrastructure are in reality no longer confined to the pages of science fiction. They actually exist in reality, in experimental laboratories and are close to ready for commercialisation. One significant example is the autonomous motor car, such as currently under development at Germany's Freire University, another project where Audi is working with Stanford University, or a third project being undertaken by Google.

Governing the NBN: Principles

AS/ISO/IEC 38500 presents six principles for good governance of Information Technology. Since publication of the original Australian Standard in January 2005, Infonomics has regularly delivered papers demonstrating that failure to attend to these principles are key causes of numerous failures of IT initiatives in both government and private sector situations. We have argued that the principles apply consistently in developing the NBN ([The Infonomics Letter, April 2009 Edition](#)), in the evolution toward Government 2.0 ([The Infonomics Letter December 2009 Edition](#)), and more broadly the across development and implementation of the overall IT strategies for the nation ([The Infonomics Letter July 2010 Edition](#)).

Building from these discussions, Infonomics now proposes that, in order to maximise the value to be realised by its investment in the NBN, the Federal Government should take the necessary steps to develop policy that embraces and applies the fundamental guidance in the standard.

Responsibility

AS/ISO/IEC 38500 advises that individuals and groups should clearly understand and accept their responsibilities for both the supply and demand aspects of IT. It follows that responsibility for IT should be clearly and appropriately allocated.

In the NBN context, there must clearly be shared responsibility. From the outset, it is clear that the government is, through NBNCo, responsible for delivering the infrastructure. But who is responsible

for delivering the value? Were the government to take on this responsibility, the private sector would be very right to argue that it was locked out by a public sector monopoly. However, this is clearly not the government's intent, though where industry does not yet understand the distinction between supply and demand (use) aspects of information technology, it is understandable that the separation of responsibility is well understood.

Taking up a responsibility requires a fundamental understanding of that responsibility. Commentary from leaders of business organisations including CEDA and the AICD, combined with the arguments against tax free imports from large retailers which have missed the start of retail market transition from shopfront to screenfront, and regular reports that Australian small and medium businesses are under-utilising existing internet opportunity all point to a need for a substantial education program which equips Australian business leaders with a sound understanding of their emerging responsibilities as our economy undergoes the next phase of its evolution into the "information age".

Infonomics is proud to be working with the Australian Industry Group to deliver such education to Ai Group's members. However, the initial program on which we have embarked is limited in scope, and a major advance in this regard is essential.

Infonomics believes that a fundamental responsibility of government, along with deployment of the required infrastructure, is to develop the awareness, understanding and hunger for advancement that is essential to achieving the long term value of NBN.

Strategy

AS/ISO/IEC 38500 recommends that the organisations business strategy should take into account the current and future capabilities of IT, while the strategic plans for IT should satisfy the current and ongoing needs of the business strategy. In practice, this principle extends deeply into the planning arrangements for current and future use of IT.

The topics identified in the terms of reference for this inquiry, and many more topics that should emerge through the course of the inquiry, all point to an imperative for strategy in most sectors of the economy that build on the opportunity of the NBN.

However, history shows that it is clearly insufficient to articulate a strategy in terms of a wistful desire. It might be argued that a vague strategy of "let's open up the nation with railways" in the late 19th century resulted in three incompatible rail gauges – a constraint that still limits the economic value of rail networks today. Similarly, more recent efforts to establish national capabilities through the exploitation of information technology have fallen foul of a lack of

common goals and cooperation – various eHealth initiatives providing prime illustrations.

In governing the growth of the NBN, it is essential that while allowing the market to take responsibility, the government identify and establish the necessary planning controls that will smooth the way for widespread adoption of NBN advances not just in Australia, but in all of Australia's current and future export markets.

Acquisition

AS/ISO/IEC 38500 essentially regards acquisition as the decision to expend resources – financial and human – on information technology. It suggests that the decisions should be made for valid reasons, on the basis of appropriate and ongoing analysis, with clear and transparent decision making, and appropriate balance between benefits, opportunities, costs and risks in both the short and long term.

While development of complementary technologies and applications for the NBN should remain with the private sector, there can be no doubt that the government will also invest heavily in such complementary technologies and applications for its own purposes.

Further, as with all areas of economic endeavour, it may be necessary and appropriate for the government to take steps to seed and encourage investment.

In all such cases of proposed investment in exploiting the NBN, the government should ensure that it has an appropriately structured set of controls in place that encourage and assist appropriate investment, while acting as a deterrent to inappropriate investment.

Performance

AS/ISO/IEC 38500 recommends that IT should be fit for purpose, providing the services, levels of service and service quality required to meet current and future business needs.

The elements of performance relevant to the NBN are diverse. From a supply perspective, the government clearly has an obligation to deliver according to plan in terms of cost, capacity, speed, reliability and durability. But this is just the tip of the iceberg.

Exploiting the NBN demands a marketplace that is aware of the potential, capable of exploiting it, and delivering real value. These are aspects of the NBN that may not have been previously considered, and it is essential that government turn its attention to the enablers. First, there must be market education to develop the underlying market awareness and insight that will drive investment. Second, there must be workforce development that provides investors with the specialised skills required to develop technology, business and social applications that exploit the NBN. Finally, there must be supporting capabilities and

other enabling actions in government agencies to remove obstacles to, and measure the real value of, outcomes arising from exploiting the NBN infrastructure.

If the government aims to advance Australian industry performance and competitiveness, leaders must be identified and praised, while laggards should equally be encouraged to improve their performance.

Conformance

AS/ISO/IEC 38500 expects organisations to understand and apply relevant rules regardless of source, and to make clear and follow their own rules as necessary.

To enable rapid and efficient exploitation of the NBN, government policy should guide bureaucrats, business leaders and the IT industry overall regarding the entire lifecycle of developing visions for NBN enabled change, to planning and implementing change, and delivering the beneficial outcomes that are the desired result of change.

There should be mechanisms to promulgate and encourage conformance to policy. If the government aims to use the NBN to enable quantum shifts in areas such as machinery of government, health, education, social welfare, economic performance, growth of Australian business and employment it should recognise and reward achievement in this regard, and censure failure.

To both encourage proper and effective use of the NBN and to discourage improper activity, government should undertake research through a consultative framework, leading to timely and effective development of any necessary laws and regulations regarding the use of the NBN.

Human Behaviour

AS/ISO/IEC 38500 recommends that the use of information technology takes into account the many facets of human behaviour.

The human behaviours that will apply in the context of the NBN are diverse and many are likely to emerge over time.

In Australia, regrettably, there appears to be a deep seated human behaviour, in business circles in particular, of failure to understand the meaning and value of that which cannot be seen and touched. While some business leaders clearly do "get it", there are many more who have demonstrated, through their rhetoric, that they cannot conceive any aspect of a future NBN-enabled Australia beyond a nation of addicts to the World Wide Web.

It is human behaviour to fear and resist the unknown. If Australia is to exploit the benefit of the visionary infrastructure advance represented by the NBN, we must educate widely and aggressively so that

business leaders replace their fear of the unknown with a hunger for the value that is undoubtedly there.

Beyond this essential first step, it is then essential that in governing the deployment and take-up of the NBN, the government and all other stakeholders acquire a comprehensive understanding of the behaviour associated with many, diverse communities of stakeholders, and take appropriate steps to foster positive behaviours while effectively neutralising any negative behaviours that do emerge.

In conclusion

Australia's National Broadband Network presents the nation with a compelling opportunity for advancement through new world leading innovation and by providing us with the means to speedily adopt advances developed in other parts of the world.

However, merely creating a network will not deliver the overall advance that is possible. Attaining the breakthroughs in current and future disciplines including health, business, government and life itself will come only with persistent, effective governance of the technology enabled change that is offered by the NBN.

AS/ISO/IEC 38500 provides an ideal framework for devising the necessary governance arrangements.

Infonomics would be pleased to expand on and more fully explain concepts presented in this paper, and would be pleased to support establishment of the appropriate governance arrangements.

Infonomics Education Program

Worldwide demand for information about ISO 38500 is growing strongly and has driven us to think about how we package and deliver education in the future. The prior three-product range has now evolved to a sophisticated program of progressive skills development where individuals can dip a toe in the water, or take a comprehensive journey through the background, intent, and application of ISO 38500. The program also includes additional learning for change agents who will be helping organisations adopt the standard, and a series of short modules to help time poor business leaders pick up the essentials without having to lock themselves away for too long.

Not all the modules are available yet, but the overall program description is easily accessed at www.infonomics.com.au/ISO_38500_Education.htm.

You can help guide us on the development and delivery sequence by taking our [short survey](#) on your views about ISO 38500 education.

Foreign Elephants

Last month we announced two important advances for Waltzing with the Elephant. We jumped the gun a little on one of them. We WILL soon be offering Waltzing with the Elephant in downloadable PDF through the UK and US websites of IT Governance Limited. However, the timetable has gone a little awry and we are eagerly looking forward to advice that the new IT Governance Limited websites are ready to take on the new load.

We're still [accepting requests](#) for the first-run print copy of the Spanish Edition of Waltzing with the Elephant.

Recent/Coming Events

Most years seem to start slowly when it comes to learning events for ISO 38500. This year it's been quite different.

Our friends at Expitris Worldwide organised the biggest ever two day class on governance of IT for Kuala Lumpur on 26-27 January. Twenty three people from three nations attended as we explored the meaning and application of the standard and assessed the governance of IT arrangements in their respective organisations.

As part of the overhaul of our education program, we've also created a secondary mailing list for Infonomics events. As soon as we have finalised results of the survey, we'll announce the updated schedule.