

I make this submission as a private individual. My professional credentials are:

- 23 years experience in the NZ ICT industry.
- 12 years experience in the Government ICT industry
- Previously been part of NZCS council, 2020 Trust.
- Involved with e-government for 8 years.
- Conceptual designer of the government's secure email system, and the online authentication system.
- Currently president of GOVIS.
- Currently implementing Federated Enterprise Architecture framework for NZ government.

3. The enablers: Connection

The strategy as written often makes an assumption that "connection" means "physically connected". Connection can also occur wirelessly, through wireless (802.11), 3G, satellite.

Using wireless increases productivity because you are more likely to be connected, therefore (1) you receive information in a more timely fashion, and can make a more timely decision; and (2) you are more likely to meet people, to exchange ideas and innovate.

NZers avoid using 802.11 and 3G because of the business models associated with casual usage. This constrains our country's competitiveness and productivity.

Two examples:

- In the US, wireless (802.11) is increasingly offered as a free service. This encourages people to meet and work in social settings, such as cafes, restaurants and parks.
- To look for an address on Googlemaps, and instructions on how to drive there, will cost \$8 in NZ, 16c in Germany, on a casual rate, <http://www.drury.net.nz/2007/12/23/all-you-can-eat-mobile-data/>

Increased usage of wireless technologies at reasonable prices is needed.

Having spoken to several major international users of datacenters, one of the reasons they will never host in NZ is lack of diverse routes. They would feel more comfortable with 5 diverse international fibre connections based on previous experiences: <http://www.cnn.com/2008/WORLD/meast/02/01/internet.outage/>

Typically they also install an earth station as a further diverse route. Sharing a satellite with Australia and the South Pacific, might be a useful strategy. It would have other uses, such as providing high-speed Internet, emergency communication.

These types of investment are strategic but we don't have the scale to do it ourselves. Can we be innovative and collaborate with our neighbouring countries, to build shared infrastructure?

More emphasis needs to be made of the importance of good connectivity, for sustainability and hence productivity.

Overseas case studies have shown that knowledge worker industries can have 20-40% of their staff do flexible work. This equates to less commuter traffic, less pressure on physical infrastructure (roads, CBD floor space (25% reduction)). Staff are more satisfied and productivity goes up (15%).

Actions

- Ensure promote 'broadband friendly councils' is not constrained to wired connections - ensure the scope includes wireless.

- Encourage the peoples network to act as wired access points for community wireless infrastructure.
- Review the government radio network infrastructures and see if they can be standardised and used for backhaul in off-peak. Could I use wireless at a DOC camping ground, to receive an updated weather report?
- Provide an innovation fund for community open source/open hardware groups to develop a scaleable wireless infrastructure.

4. The enablers: Confidence

Managers need confidence in their skills to manage staff making use of ICT, to enable flexible working.

Using ICT to enable flexible working (telecommuting) has existed as an opportunity for at least 10 years. It is not a latest development, but it has the capability to deliver significant benefits for the government's stated sustainability and workplace productivity goals.

Typical case studies quote:

For businesses:

- Increase productivity 15-60%
- Reduce absenteeism upto 60%
- Reduce CO2 footprint upto 60%
- Reduce office floorspace 30-40%

For participants:

- Improve happiness 7%

This is complex organisational change, involving collaboration between ICT, HR and FM (Facilities Management). Few NZ organisations have achieved this. Our NZ example was from 5 years - the Kapiti Telecentre - it did not succeed.

The strategy does not identify the key drivers for the shortage of skilled ICT practitioners. It does not define the terms "ICT practitioners" or "skilled". Without a clear statement of the drivers and definitions, interventions are untargetted.

My assumptions are:

- "ICT practitioners" means people who are part of the ICT industry.
- "skilled" means people who use ICT to add value to a business. They typically seek new opportunities for innovation.
- "unskilled" means people who maintain ICT infrastructure - they may be technically skilled, but they are not business skilled.

The shortage of skilled ICT practitioners in NZ is caused by a number of factors:

- Ageing work force
- Increasing overseas demand for ICT professionals
- An unscalable model for ICT
 - every NGO and SME does not need a CIO, a mail server administrator, or a hardware technician
 - a consumption based model that assumes hardware replacement every 2-3 years

If this country is to lead the world, we need innovative solutions. As a suggestion, I propose an alternative architecture, using technology that is already available in New Zealand.

Computing can be done using a \$300 thin client device, that uses 20 watts, starts in 2 seconds and lasts 10 years - connected to a virtualised server, costing 10c per hour to run. A subscriber can plug their card into any thin client and access their resources securely over the Internet.

This example demonstrates a commodity computing solution that minimises e-waste, minimises capital expenditure / offshore profits, minimises power consumption and increases flexibility. The need for "unskilled" jobs reduces, because the access devices are just dumb devices.

Several ICT companies in NZ have already implemented similar designs. The emerging strategic risk is that normal market practice will prevail, and the companies will vertically integrate the solution, so my Telco-T card does not work in a Telco-V device.

The strategic value is that this architecture is similar to the GSM network architecture. The ubiquity of the GSM standard has been advantageous to both consumers (who benefit from the ability to roam and switch carriers without switching phones) and also to network operators (who can choose equipment from any of the many vendors implementing GSM).

NZers need confidence in how their personal information is used, by the public and private sectors.

People are starting to recognise that their personal information has value, and that they can exchange that value for free services. This occurs with every aspect of life, from the physical (Flybuys) to virtual (Facebook).

There are a number of initiatives underway within the US to monetise personal data, and make it more portable.

NZ can lead the way, by developing a Privacy Commons, so that people can understand and transfer rights associated with their personal data, in an internationally recognised framework. This is similar to the Creative Commons concept and could be achieved using the same organisations. Cost would be \$500k - \$1m.

Further Actions

Lead by example. Implement flexible working in government and record/research the productivity gains as a case-study for NZ business. Set some moderate stretch targets such as reduce government office floor space/costs by 25-30%.

Enhance technical security (and therefore confidence) by implementing .nz domain SSL certificates, for machine-to-machine authentication. If we use open source PKI, then project should be less than \$1m.

5. The enablers: Content

Reduce the cost for the taxpayer. Don't assume that government must do it all and own it all.

Create an ICT environment which allows taxpayers to create/store their New Zealand-grown content, in a way that meets their requirements and also the government's need to archive/record such content.

We don't need 2 copies of the information, (1 held by me, 1 held by govt) - we need a single copy, with access rights by both parties, accessible using the Internet.

Further Actions

Some other concrete actions that would improve accessibility to government information include:

(1) Use of microformats to mark up information on government web pages - so it is machine readable and can be reused for other purposes, e.g. <http://www.epa.gov/enviro/wme/>

(2) Provision of more granular information, as RSS feeds, so that communities can automate the collection and publication of topics of interest, e.g. <http://www.everyblock.com/>

(3) Development of a data portal, e.g. <http://data.octo.dc.gov/>

6. The enablers: Collaboration

Commodity computing means that I can rent a virtual server from Amazon for 10c per hour.
<http://www.amazon.com/b/?node=201590011>

If NZ ICT companies offer computing at \$1 per hour, then my production costs are a magnitude higher. If this is an issue, then NZ commodity computing will be provided by low cost offshore providers, such as Amazon, Google, Microsoft.

If the NZ ICT industry is to survive, it has to collaborate on a new scale, to achieve sufficient economies of scale. Potentially it may mean cross-Tasman collaboration, as a single small country like Australia or New Zealand may not have the critical mass.

With a sustainably designed google-size datacenter, we have the opportunity to go further than any other country. <http://harpers.org/media/slideshow/annot/2008-03/index.html>

As described in my 4.2 comments, the NZ ICT industry has the opportunity to collaborate and build a new national ICT architecture that reaps the benefits of a GSM-type network.

7. Achieving our digital potential

An additional enabler is "Computing Capability". Can NZ provide capacity computing (cpu, storage) at sufficient economies of scale to compete with the rest of the world?

Refer to my comments in 4.2. Using ICT to enable flexible working (telecommuting) has existed as an opportunity for at least 10 years. It is not a latest development, but it has the capability to deliver significant benefits for the government's stated sustainability and workplace productivity goals. We have not done this well as a country - what can we do better/differently?

Productivity

The strategy needs to draw out the unique productivity benefit of ICT - over time you get more bang for your buck. If you can export cpu cycles, then you can export more for the same money, every 18 months. No other industry is like that. We can't produce twice as many sheep/aluminium ingots every 18 months for the same cost.

To be a sustainable export ICT commodity computing industry, you need to fix your input (renewable energy), and set a requirement to reduce waste outputs, by x% every year. Such constraints would ensure innovation in chip design, ICT operation, etc.

The government could support this innovation by specifying these types of requirements when procuring computing resources, and consolidating its procurement.

The current business model of desktop PCs, connected to a locally hosted server is unproductive and unsustainable for the country. Computing could be done using a \$300 thin client device that uses 20 watts, starts in 2 seconds and lasts 10 years - connected to a virtualised server, costing 10c per hour to run.

Why do SMEs continue to pay for localised hardware, software, network installation and support, as well as suffer the business impacts of system failure? The ICT industry needs to move quickly to offer computing as a commodity service. It goes without saying that a prerequisite for this service, is reliable broadband.

Sustainability

This section needs major work. For a start, refer to the talks at the GOVIS 2008 mini-conference on sustainable ICT, which highlights the wider strategic issues.

- ICT has an eco-impact: ICT is responsible for 2% of global CO2. ewaste is responsible for 70% of landfill heavy metals.
- The current consumer model of technology refreshes every 2-3 years, contributes to this problem.
- Its effects are potentially offset by it enabling changes, such as telecommuting which can reduce CO2 footprint by 70%.

A different architecture (thin-client, consolidated national datacenter) will increase these benefits.

There is no current eco-impact benchmark; perhaps it is something NZ could develop.

We need an agreed view of what "sustainable" means.

Many consumers are not recycling old electronic gadgets. Even if they do recycle, the distributed nature of recycling is "extremely inefficient".

Many people say they keep old devices with a view to passing them on to relatives - old devices can be less energy efficient, thereby increasing their CO2 impact.

More info, refer to http://www.nzherald.co.nz/section/story.cfm?c_id=5&objectid=10505184&pnum=0