

An abstract graphic featuring overlapping text and shapes. The words 'DIGITAL STRATEGY' and '2.0' are repeated in various colors (purple, yellow, white) and orientations. A large, bold '2.0' is positioned on the right side. The background is white with a dark purple horizontal bar at the bottom.

DIGITAL STRATEGY 2.0

ACHIEVING OUR DIGITAL POTENTIAL

ACKNOWLEDGEMENT

Many interest groups, individuals and government agencies have contributed to the development of the *Draft Digital Strategy 2.0*. Special thanks go to the Digital Strategy Advisory Group, the Digital Strategy Steering Group, speakers and participants at the Digital Future Summit 2.0 and participants in the stakeholder workshops.

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NEW DIGITAL ENVIRONMENT

COLLABORATION

CONTENT

MINISTER'S FOREWORD



ACHIEVING OUR DIGITAL POTENTIAL

We have come a long way since the *2005 Digital Strategy* was released. Now it is time to reassess the strategy's goals, consider new developments and focus our attention on the tasks ahead. Despite measurable progress, much more remains to be done.

New Zealanders have made clear that they see fast, affordable broadband as a business and personal necessity.

Supported by a rock-solid Parliamentary mandate in 2006 following the release of the Telecommunications Stocktake and passage of the resulting Amendment Act, we have unbundled the local loop and completed the operational separation of Telecom New Zealand.

Broadband prices have already tumbled to below 'a dollar a day' and New Zealand's broadband performance has begun to lift from 23rd to 20th in the OECD.

In 2005, the mood was one of quiet desperation. Today, we see energy, enthusiasm and a renewed sense of purpose.

But that is not, in itself, enough to deliver on our vision of a knowledge-rich, tech-savvy society.

The *2005 Digital Strategy* broke new ground by stating that user capability and confidence, and digital content are as important to realising the socio-economic benefits of ICT as the connections themselves.

So we took a broad view of the digital agenda and put in place whole-of-government coordination arrangements.

The Digital Strategy Advisory Group was set up to integrate advice from across the sector.

New Zealand's Digital Content Strategy was launched in late 2007. It provided the context for the amazing activities happening in the digital content world and identifies the major factors that influence that world. It sets some key challenges and tangible actions to deliver on those challenges. The response to this strategy has been overwhelmingly positive.

The Digital Future Summit 2.0 that the Prime Minister called for late last year issued fresh challenges which provide a clear focus for a refreshed *Digital Strategy 2.0*.

Looking to a time in the near future where ubiquitous fast broadband and the fully interactive web are taken as a given, the Summit challenged all of us to define and capture the benefits that living and working in this new digital society will bring.

Accordingly, Chapter 7 of this draft strategy provides an opportunity for your input to help answer this question.

Based on inputs received so far, and our research, we've crystallised those key benefits (or "outcomes") into three key areas:

- ▶ productivity
- ▶ sustainability, and
- ▶ community (including our unique identity).

We want you to tell us what you think matters, and how the smart use of ICT should transform New Zealand.

Government doesn't have all the answers. We want your energy, drive and commitment in order to get there.

This document is a call to action for all of us.

Please read this draft strategy carefully and think about its implications for you and for New Zealand. Think about how, by 'being digital', you can contribute to improving productivity, enriching our communities and ensuring a sustainable future for New Zealanders.

Then tell us what you think. We have provided you with some new tools – a wiki and online dialogue boxes, as well as an online submission form for you to send us your feedback on this document during April and May, in time for the release of the final strategy mid-year.

I look forward to hearing from you.



Hon David Cunliffe
Minister for Communications and Information Technology
14 April 2008

INTRODUCTION

1.1 THE DIGITAL STRATEGY

The vision: New Zealand will be a world leader in using information and technology to realise its economic, social, environmental and cultural goals, to the benefit of all New Zealanders.

The *2005 Digital Strategy* painted a picture of how we would create a digital future for all New Zealanders, using the power of information and communications technology to enhance all aspects of our lives. In the past three years, the strategy's vision and strategic framework have been tested by many key developments. Communities, businesses and government organisations have also responded to the challenges and together forged a strong understanding of how digital technology is transforming our lives, industries and civic participation.

Revolutionary change has occurred in telecommunications since the *2005 Digital Strategy* called for rapid progress on connection issues. Robust, pro-competitive settings have been put in place, following the 2005-06 Telecommunications Stocktake, resulting in the urgent passage of the Telecommunications Amendment Act 2006. The Act marked the beginning of a new era in New Zealand's telecommunications environment – the unbundling of the local loop, the operational separation of Telecom New Zealand and a much stronger role for the Telecommunications Commissioner.

Many of the targets of the *2005 Digital Strategy* have now been achieved, while others remaining are not ambitious enough in the current environment. New challenges, such as those posed by digital convergence or by our rapidly growing energy consumption, have also risen to prominence. We need a refreshed digital strategy – *Digital Strategy 2.0* – that builds on the original framework and actions, yet reflects today's concerns and incorporates the latest thinking of our digital technology leaders and innovators.

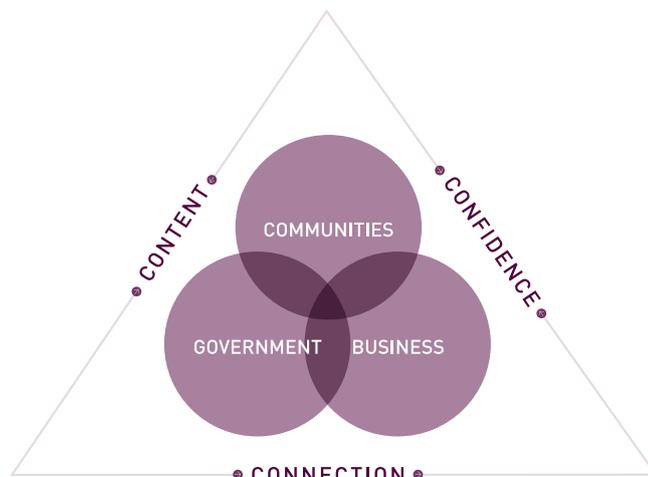
This is your opportunity to take part in the national conversation about our digital future. In this chapter, we summarise the progress made since the launch of the *2005 Digital Strategy*. Chapter 2 describes the big changes of the past few years and outlines the challenges identified at the Digital Future Summit 2.0. Chapters 3–5 cover the new goals, priorities and challenges for the digital enablers – connection, confidence and content – and what the government intends to do about them. Chapter 6 identifies the collaboration partners necessary to achieve our digital potential. Chapter 7 outlines the outcomes made possible by being digital, and Chapter 8 explains how you can have your say on this draft strategy.

Do you think the *Draft Digital Strategy 2.0* fairly reflects the digital issues and challenges New Zealand needs to confront over the next few years? Tell us your views and work with us to achieve our digital potential.

1.2 PROGRESS SINCE 2005

The *2005 Digital Strategy* identified three enablers – connection, confidence and content, and three agents of change – communities, businesses and government, for responding to the challenges and opportunities of a rapidly-changing digital environment. Government agencies, working closely with community organisations and businesses, have made significant progress in achieving the digital strategy targets through more than 70 initiatives.

Some of this progress is described below. For a more detailed account, you can download the *Digital Strategy Report on Progress 2007* from the digital strategy website, www.digitalstrategy.govt.nz.



**The 2005 Digital Strategy framework:
enablers and agents of change**

Regulatory reforms in the telecommunications sector

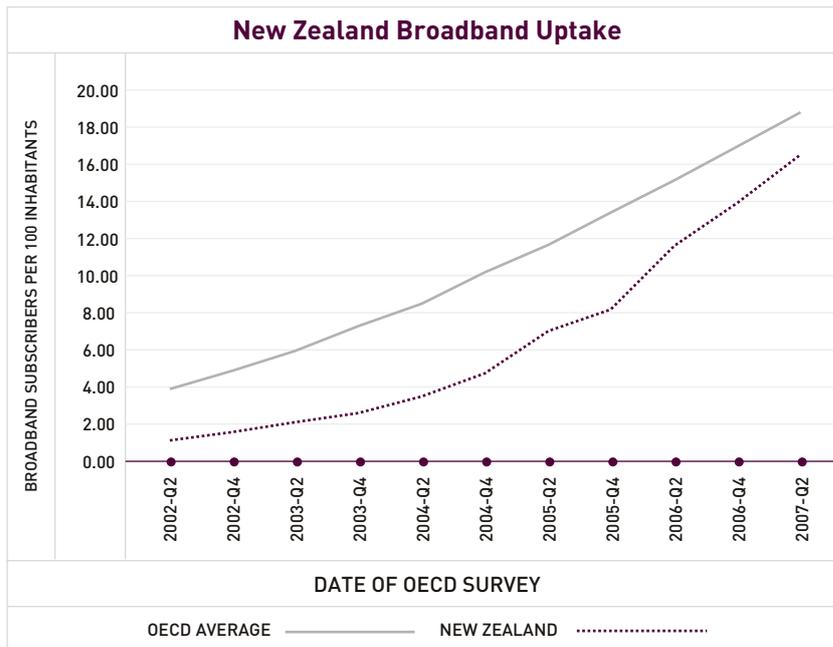
The revolutionary telecommunications regulatory reforms of 2005/06, especially the introduction of the Telecommunications Amendment Act 2006, are stimulating new investment and competition in the marketplace. These changes now equip New Zealand for the new digital age – where the smart use of technology will determine our continued prosperity as a nation.

The Telecommunications Amendment Act 2006 marked the beginning of a new era by:

- ▶ promoting competition and equal access to key wholesale services
- ▶ providing a process to settle a robust three-way operational separation of Telecom (network, wholesale and retail)
- ▶ bringing New Zealand into line with international best practice by unbundling the local telephone loop and ensuring access to 'naked DSL'
- ▶ empowering the Telecommunications Commissioner to effectively monitor industry development elements and regulatory compliance.

These changes are already having a marked impact on our digital future. In two years, New Zealand has already climbed three places to 20th out of 30 in the OECD for broadband subscribers per 100 inhabitants – by June 2007 we had 16.5 subscribers per 100 population, compared to the OECD average of 18.8. Broadband uptake has also grown by 137 per cent in two years, putting us in the OECD top ten for rate of growth in broadband uptake.

INTRODUCTION



Local loop unbundling is stimulating new investment and competition as operators seek to attract customers before installing equipment in Telecom's exchanges. Telecom's operational separation will improve competition in services by providing non-discriminatory access to its network assets. That will ensure that all telcos can compete on the same terms. Telecom is committed to rolling out fibre to all towns with more than 500 lines – covering 80 per cent of the population. This unprecedented level of investment will dramatically improve the broadband performance available to New Zealanders.

The government is also currently looking at incentives for telcos to invest in rural regions where broadband is not commercially viable at present. The Telecommunications Service Obligations (TSO) Review will improve service in rural areas. It is part of an ongoing process with the telecommunications industry to improve investment incentives.

Shared public sector networks

The Government Shared Network (GSN) has been established to provide a platform for high-speed, network-based collaboration between public sector agencies. The shared network will improve the quality of information and services offered to the New Zealand public.

The Kiwi Advanced Research and Education Network (KAREN), a \$43 million government investment, went live in 2006 and now connects all New Zealand tertiary institutions and research organisations, as well as the National Library, with the rest of the world. KAREN provides ultra-high-speed networking capabilities (up to 10,000 times the speed of a standard broadband connection) and supports access to advanced computing infrastructure for New Zealand educators, researchers and innovators.

Partnerships with businesses and communities

The Broadband Challenge Fund made \$24 million available over four years to stimulate investment in open-access fibre networks through public-private partnerships. For example, Vector Communications Ltd, in partnership with the North Shore City Council, received \$4.6 million to build a 38km extension to the existing fibre network. Called the North Shore Urban Fibre Network, this serves the North Shore Education and Access Loop (NEAL), which currently delivers high-speed connections of up to 1Gbps to 42 schools, six libraries, and 21 council buildings and community centres.

The Community Partnership Fund also made \$17.4 million available over four years to help community organisations realise their digital aspirations, including projects to improve the ICT skills of community members. The fund has supported over 114 digital initiatives to enhance the confidence and capability of New Zealand communities.

MOTATAU MARAE TRUSTEES – CYBER WHARE

Hei korowai mō ngā iwi puta noa i te ao – building people’s capability to enable a connection to the world.

Located in Northland, the isolated community of Motatau faced many challenges in accessing reliable computers and high-speed internet.

Feedback gathered by the Motatau Marae Trustees revealed a strong desire to establish a community house with ICT capability. The Trustees have since received funding from the Community Partnership Fund to create a ‘Cyber Whare’.

Based on the concept of a cybercafé, the Cyber Whare provides tuition to local people to help them become ICT trainers and facilitators themselves. It aims to produce a community-driven environment that will encourage the community to use ICT as a tool for gathering information, gaining new skills and taking Motatau’s knowledge to the world.

The Cyber Whare has a major focus on online learning and improving skills in the community with the aim of developing and promoting local enterprises.

Motatau’s Whare is one of a network of Cyber Whare throughout Northland. Four of them work together, sharing their experience and resources, and supporting each other in delivering quality ICT services and training to their communities. Access to this team helps to provide IT development, technical support, maintenance and training resources.

The Cyber Whare will go a long way towards overcoming the digital divide in the small community of Motatau.

See www.digital-strategy.govt.nz/Funding/The-Community-Partnership-Fund for more information on the Motatau Cyber Whare.

INTRODUCTION

Education enablers

Several of the pilot education programmes established under the *2005 Digital Strategy* have been completed, including Digital Bridges, the Community Technicians Programme and Digital Imaging for Special Education. The pilots will be evaluated in 2008, and the successful ones could be scaled up.

Other education programmes, such as the KiwiCareers Pathfinder, a free career guidance programme offered online, and the Laptops for Principals and Teachers Programme are continuing successfully.

Online security

In 2005, the Internet Safety Group carried out a National Computer Security Education Campaign, and in 2007, the government passed the Unsolicited Electronic Messages Act 2007, New Zealand's anti-spam legislation.

New Zealand digital content

*New Zealand's Digital Content Strategy*¹ was launched in 2007. It focuses on the value of creating, discovering and using New Zealand-born digital content. The government is putting just under \$23 million into new actions for the content strategy.

*Te Ara – The Encyclopaedia of New Zealand*² has continued to evolve as a comprehensive online guide to New Zealand, greatly increasing its interactive elements in 2007. NZLive.com, the digital gateway to the arts, culture and heritage sector, was launched in 2006 and continues to add new features.

Government agencies have built the foundations for e-government through the *e-Government Strategy*, which aims to deliver integrated, accessible and customised government information and services to citizens by 2010.

In broadcasting, some significant initiatives have taken advantage of the converging broadcasting and telecommunications environment. These include:

- ▶ the launch of TVNZ ondemand
- ▶ live streaming and podcasts from Radio New Zealand's website
- ▶ free-to-air digital television via the Freeview platform
- ▶ the launch of the Māori Television Service, with a second service to come on Freeview
- ▶ the launch of new digital channels, such as TVNZ6, TVNZ7, Triangle Stratos and Parliament TV
- ▶ CPF-funded streaming services for access radio stations
- ▶ digitisation of nationally significant iwi radio recordings, also with CPF funding
- ▶ the Broadcasting Amendment Bill 2007, enabling NZ On Air and Te Māngai Pāho to support the production, transmission and archiving of digital content.

The government has introduced amendments to the Copyright Act 1994 so that it remains relevant and effective in a digital environment. Work continues on issues related to the needs and aspirations of Māori in relation to mātauranga Māori and the intellectual property system. The government is also encouraging the release of publicly funded research information to benefit the commercial sector and wider New Zealand population.

1 Go to www.digitalcontent.govt.nz

2 Go to www.teara.govt.nz

KETE HOROWHENUA

The Community Partnership Fund, Horowhenua District Council, and technology partners SeniorNet Horowhenua and Katipo have been strategic partners in the Kete Horowhenua project in the Levin community.

This project compiled an online digital library of Horowhenua resources including digitised photographs, museum objects, arts and crafts objects, audio and video recordings, public speeches and performances of all kinds. This involved the integration of two New Zealand developed open source systems into a new open source digital library management system – Kete Horowhenua. Tutors and volunteers were trained in making digital images of their collections using loan equipment provided under the project. They were also trained to record them in the digital library under the guidance of the Horowhenua Library Trust.

The community has responded enthusiastically and provided a huge array of resources.

The Kete Horowhenua is a good example of a project seeded by the CPF, where central government, local government, businesses and communities have worked together to improve access to locally relevant content and to develop digital literacy while creating an innovative open source platform. A toolkit was created to also allow other communities to use it for creating their own community library of rich local resources.

www.horowhenua.kete.net.nz

Significant progress made – but there are new challenges ahead

Significant progress has been made in the past three years. The total investment has been considerable. Since 2005, the government has committed about \$400 million to digital strategy initiatives (including baseline funding).

Although we have achieved most of our targets, there is plenty more to be done. We are still below the OECD average in broadband uptake. The feedback from the Digital Future Summit 2.0 in November 2007 was that digital skill shortages could stand in the way of achieving our digital potential. There are a myriad of opportunities to be explored, particularly in the areas of digital content and technology-based productivity growth.

NEW DIGITAL ENVIRONMENT

2.1 THE DIGITAL REVOLUTION

In the few years since the *2005 Digital Strategy*, we have seen changes in the ways people communicate, interact, do business and experience their histories and cultures. Today's digital technologies are enabling new expressions of New Zealanders' sense of identity and community on screen and online. New business models are emerging, disrupting the old. Citizen-centred transactions have the potential to transform government. Smart digital technologies are enabling us to do things faster but with fewer resources.

It is time to respond to the digital revolution, the challenges it poses, and what it means for the future of our country. The refreshed digital strategy will be the product of this national conversation. It will be the yardstick to measure our progress towards our digital future over the next few years.

The internet generation

The internet generation are those young people born since the World Wide Web was created in 1989. In the past three years, this generation started entering tertiary education and joining the workforce. They have new ideas and different values. They play, shop and communicate using digital technologies with an ease older people can only admire. They are our future innovators, creatives and leaders in the digital space. Those with skills and talent of an international standard will be highly sought after in the global jobs market. We must give them good reason to stay connected to New Zealand as their nation of origin.

The participative web

With the coming of broadband, the internet has rapidly shifted from a network of largely static webpages and email to a network characterised by rich content, user interaction and real-time participation. In the participative web, nicknamed 'web 2.0', upload speeds have become as important as download speeds, as users create, remix and share their own content while communicating online with social and extended community networks. People share their own photos and videos with friends and family through free web services like Flickr and YouTube, while blogs, forums and wikis have become tools of choice to build online communities.

Digital broadcasting

In 2007, public broadcasting made the shift to a digital platform, launched as part of the Freeview consortium. In 2008, high-definition digital television has been launched. Given other countries' experiences, we can expect other digital platforms such as game consoles, media centres and 3G mobile phones to become more popular as on-demand digital content sources. As well as creating and sharing their own content on the internet, New Zealanders are gaining access to an unprecedented amount of audiovisual content from across the globe.

Digital culture

With an entire generation now having grown up with the internet, mobile phones and digital music, content not accessible in digital form risks being ignored or forgotten, while volumes of overseas digital content can potentially drown out our home-grown products. Digital technologies are now enabling many opportunities for New Zealand creative and cultural expression in the fields of music, the performing and visual arts, film, television, radio, literature and design. However, content creators and those charged with maintaining our cultural memory are grappling with the emerging need to ensure New Zealand's non-digital content can still be discovered, while improving the use, visibility and management of locally produced digital content for New Zealand audiences.

Converging technology markets

Once operating as distinct businesses in very different markets, broadcasters, phone companies and internet service providers today are rapidly converging, offering integrated services and competing for content and customers. Mobile devices have become an important connection point to the internet, while voice over internet protocol (VoIP) and internet protocol television (IPTV) can be expected to grow. The government’s regulatory reforms in the telecommunications sector are also stimulating competition, enabling small, innovative companies to offer services with affordable start-up costs.

Digital business and the ‘long tail’

We are now seeing a new kind of kiwi firm that does business digitally and uses the internet as its only channel to market. Hosted storage, middleware applications and Software as a Service (SaaS) are growing business areas. Such firms can be based in New Zealand and operate in the global marketplace, as long as they have access to fast, affordable broadband.

There are many examples of smaller enterprises transacting globally from New Zealand and taking advantage of what writer Chris Anderson in 2006 termed the ‘long tail’ – the market economics of many small niche businesses offering consumers a huge range of choices.³

We now understand more clearly how digital technologies can raise economic productivity by improving business processes. Digital technologies have driven growth in many OECD countries and will be a powerful tool in New Zealand’s economic transformation. At the same time, these technologies can help capture commercial opportunities arising from the strong and ongoing pressure for environmental sustainability.

GROWING DIGITAL BUSINESSES //

Xero is a good example of a New Zealand firm that has recognised the benefits of SaaS. Xero offers an accounting tool to customers around the world without them having to buy the software, host it and have on-site information technology expertise. www.xero.com.

Such diverse businesses as adventure tourism and landscape photography are taking advantage of the long tail made possible by the internet. Photographer Andris Apse may live in Okarito on the West Coast but he sells archival prints of his landscape photographs from a library of 25,000 images on his website www.andrisapse.com.

Copyright in the digital domain

The protection of intellectual property creates complex issues for policy makers worldwide. Before the digital revolution, it was easier to protect the rights of copyright owners from unlawful distribution and sale of their works. Commercial content distributors are now experimenting with new revenue models for online distribution in order to reduce illegal downloading, while Creative Commons licences have grown popular for a lot of non-commercial content use.

³ Anderson, Chris (2006). *The Long Tail: Why the Future of Business Is Selling Less of More*. New York: Hyperion.

NEW DIGITAL ENVIRONMENT

2.2 THE CHALLENGES

Digital Strategy 2.0 will need to take account of this fast-moving environment. For New Zealand to be digitally nimble, we must be adept in using the latest digital technologies, businesses must be ready to benefit from the global business opportunities offered by digital technology and broadband, and the government must be able to respond rapidly to technology developments and environmental changes.

As a key part of the digital strategy refresh, the Digital Future Summit 2.0 held in November 2007 engaged stakeholders in a national conversation on the direction and shape of New Zealand's digital future. The feedback from the Summit has been both positive and constructive, and has directly informed this draft strategy.

The *2005 Digital Strategy* identified the three enablers, known as the three Cs, for ensuring all New Zealanders can take advantage of our digital future: **connection, confidence** and **content**. The Summit affirmed that the three Cs are still the critical enablers and that we have made good progress under each, allowing the future emphasis to change.

THE THREE ENABLERS // // // //

- ▶ **Connection** – high-speed broadband provides the means to be digital.
- ▶ **Confidence** gives us the skills and a secure digital environment.
- ▶ **Content** is the driver for connection and confidence by providing a compelling reason to be digital.

The Summit also recognised that we can no longer consider the agents of change – communities, businesses and government – in isolation from each other. They must be better connected and their interests better aligned on digital matters. We must also take better account of the interests of Māori, local government and the research community. **Collaboration** is the new fourth enabler of the digital strategy.

The six challenges presented by participants at the close of the Summit reflect the renewed focus on the enablers – the three Cs and collaboration, and on the outcomes that can be achieved from being digital.

THE DIGITAL FUTURE SUMMIT 2.0 CHALLENGES // // // //

The agents of change must collaborate:

“The more effectively that central government, local government, businesses and communities work together, the faster broadband connectivity will happen. How can we work together more effectively?”

We need faster and cheaper broadband:

“Fast, affordable and broadly available internet access is essential for us to make the transition to a digital economy. What immediate practical steps can be taken to make this happen?”

Make better use of digital technology across the economy:

“Increasing productivity and innovation is key to transforming our economy. How can digital technologies be leveraged in the quest for higher productivity?”

Think differently about digital technology:

"A mindset change to adopt technology and 'be digital' is needed across New Zealand to take us forward. How do we do this?"

Ensure that everyone benefits from being digital:

"The digital revolution is not being shared equally across all ages, regions, ethnic groups and other communities in New Zealand. How can the digital divide be bridged?"

Make better use of digital technology for sustainability:

"The issue of sustainability is affecting every part of our economy and society. How can digital solutions be leveraged to help us achieve our sustainability goals?"

THE DIGITAL FUTURE SUMMIT 2.0

About 540 people attended the Digital Future Summit 2.0 in November 2007. They represented a broad cross-section of New Zealand interest groups, including local and international businesses, communities, young people, researchers, Māori, and central and local government organisations. Webcast live and via Second Life, many more New Zealanders were also able to participate virtually.

The Summit was chaired by international financial journalist Rod Oram. Inspirational speakers included Generation Y presenters telling us we are not moving fast enough, New Zealand telecommunications specialists sharing their wisdom and internationally renowned speakers who contributed their ideas on New Zealand's digital future.

To help reduce the Summit's carbon footprint, author of *The Long Tail* Chris Anderson and Andy Lark, expatriate kiwi and Vice-President of Dell Computers, both presented via high-definition videoconferencing rather than attending in person. Chris talked about the trend away from popular products to customised products, and viewing the likes of Google and Facebook as aggregators of content and people niches, respectively. Andy suggested that bandwidth was not our only challenge, as the technology demands for electricity supply to data storage centres are rising exponentially, challenging their sustainability.

TradeMe founder Sam Morgan, suggested that the future of markets is online, allowing firms to buy and sell in ways that have not been available before. Online, niche markets can be combined in ways that stimulate innovation and keep small global players, like New Zealand, internationally competitive.



CONNECTION

3.1 THE NEW GOAL

The widespread availability of fast and affordable broadband meeting the needs of New Zealanders.

Fast and affordable broadband will help us achieve our digital potential. Getting more people, communities and businesses to use fast broadband connections will stimulate innovation, increase productivity and help New Zealand integrate with the global community. Bandwidth is now even more important than when the *2005 Digital Strategy* was launched.

Fast, affordable and broadly available internet access is essential for us to make the transition to a digital economy. What immediate practical steps can be taken to make this happen? – Summit challenge

The right regulatory settings, the right investment environment, a healthy competitive landscape and demand for connectivity will help us achieve high connection levels.

3.2 CONNECTION PRIORITIES AND CHALLENGES

Recent regulatory changes have laid the groundwork for more competition within the telecommunications sector and will stimulate investment in broadband infrastructure. The reforms of the past couple of years have been a watershed for the industry as entrants identify new market opportunities and larger telcos ramp up their investment in response to new market pressures. Changes in the telecommunications sector will only accelerate as consumers respond to the availability of new and innovative services.

Through its role as regulator, customer and infrastructure funder, the government will take further steps to improve investment in New Zealand's broadband infrastructure. There are two key priorities for action:

- ▶ **Promoting a robust and competitive telecommunications market.**
- ▶ **Facilitating the deployment of high-speed broadband infrastructure.**

Targeted actions under these two priorities will support the *2005 Digital Strategy* objective of moving New Zealand up the OECD rankings in broadband uptake and the availability of advanced broadband services. Although new investments announced recently will make a difference to broadband performance, the government and business sectors still need to take concerted action to ensure bandwidth is no longer a constraint on New Zealand's economic and social aspirations.

CONNECTION

New Zealand's progress towards filling these gaps will be measured by:

- ▶ the widespread deployment of FTTN, as an intermediate step towards fibre-to-the-home, so that by 2012, 80 per cent of users can access broadband connections of at least 20Mbps and 90 per cent have access to broadband connections of at least 10Mbps
- ▶ having open-access urban fibre loops operating in 15 cities and towns by 2012, to support the high bandwidth needs of large businesses, and municipalities, universities, schools and hospitals (MUSH entities)
- ▶ improving the coverage of terrestrial broadband, from 93 per cent to 97 per cent of the population by 2012, with more affordable satellite solutions for remote locations
- ▶ an additional international cable by 2012, to make New Zealand's international connections more resilient and improve competition in the supply of international bandwidth
- ▶ ensuring all major public institutions, particularly within the health and education sectors, adopt effective demand aggregation strategies that enable the deployment of 1Gbps connections by 2012.

eRESEARCH IN NEW ZEALAND

New Zealand's research community is essential to innovation. It is responsible for the creation of new technologies and has a key role in supporting new education topics and methodologies.

eResearch is real-time data sharing in research, science and technology using web-based tools and is rapidly developing in New Zealand

Globally, all researchers need to collaborate better on research and education projects, exchange large volumes of data in real time, and gain access to large-scale national and international infrastructure such as super computers. Having an ultra-fast advanced network such as the Kiwi Advanced Research and Education Network is only part of the picture. KAREN's main role is to enable research and support tools such as:

- ▶ **virtual research environments** – 'virtual spaces' created by information technology tools or systems
- ▶ **data repositories** – online databases containing research data
- ▶ **grid computing** – a group of geographically dispersed computers linked to function as a 'super computer'.

CONFIDENCE

4.1 THE NEW GOAL

Digitally capable and confident New Zealanders transforming our economy, strengthening national identity and enhancing sustainability.

Digitally capable New Zealanders will lift our economic performance and build more cohesive communities.

Managers need digital management skills to invest in and apply digital technologies that will raise firms' productivity and create successful new products and services. People who specialise in developing, operating and maintaining ICT systems need a different set of practitioner skills. ICT users need other skills to apply digital technologies in the workplace and the community, ranging from basic digital literacy through to more advanced applications in specific industries.

In addition to digital skills, it is important that everyone feels confident and safe in a digital environment.

4.2 CAPABILITY PRIORITIES AND CHALLENGES

Capability actions will be coordinated around three priorities:

- ▶ **Equipping managers with the skills needed to engage with and use ICT to increase productivity and innovation.**
- ▶ **Reducing shortages of skilled ICT practitioners.**
- ▶ **Developing digital literacy and confidence in the workforce and our communities.**

Exploring the latest developments in digital technology and their potential to lead to productivity gains requires distinct skills in managing organisational change and innovation. This is a new theme for the *Draft Digital Strategy 2.0*.

Our businesses, communities and public institutions need access to competent and relevant ICT practitioners. The gap between demand and supply is increasing.⁴ Highly skilled ICT practitioners are globally mobile, and New Zealand needs to have an urgent emphasis on both developing the required skills and creating the environment to attract skilled people.

Many New Zealanders are now comfortable with digital technologies, but some avoid them, opt out, or simply lack the confidence and skills to use them. Being digitally literate in the 21st century is essential for all citizens as digital technologies become tools of choice for social engagement, information gathering and democratic participation. We need all New Zealanders to be comfortable using digital technologies.

The digital revolution is not being shared equally across all ages, regions, ethnic groups and other communities in New Zealand. How can the digital divide be bridged? – Summit challenge

⁴ Reports by the Department of Labour show that 4,000 new IT jobs were created per year between June 2001 and June 2006. During the same period, the number of students enrolled for IT degrees declined by 44 per cent. Currently, 118 out of 134 IT specialisations are experiencing acute shortage. Department of Labour, *Information Technology Recruiters Survey 2006*, www.dol.govt.nz/publications/jvm/recruit/2006/index.asp.

Communities can play a central role in developing digital literacy. Communities are asking that the Community Partnership Fund be extended to promote new projects, and grassroots innovation, and to scale up and replicate successful projects at a national level.

In developing digital capability, we need to:

- ▶ improve the knowledge and skills of managers who will lead New Zealand's economic transformation through the use of digital technologies
- ▶ address the shortage of ICT practitioners by better aligning education programmes and industry needs to improve skill mix and quality
- ▶ elevate the status of ICT careers and qualifications to attract and retain skilled workers
- ▶ help employers to improve their recruitment and retention of ICT practitioners domestically and overseas
- ▶ use an effective, coordinated approach to developing ICT practitioner skills
- ▶ ensure that secondary school students are aware of and well prepared to pursue careers in digital technology and business
- ▶ develop general digital literacy in schools, and in the community through voluntary sector organisations.

AOTEAROA NEW ZEALAND PEOPLE'S NETWORK

The Aotearoa New Zealand People's Network provides free broadband internet access in public libraries, so that all New Zealanders can create, access and experience digital content. It was initially funded by the CPF, in partnership with local councils.

The People's Network benefits anyone who has access to a public library – opening up the digital world by providing access to high-speed internet as well as computers and training. Libraries and their staff also benefit as they build their skills and knowledge of the online world, becoming online experts and in turn sharing this knowledge.

The People's Network is being rolled out in 2008 in Taranaki, Wairarapa/Tararua, West Coast, Canterbury and Kawerau, involving 35 libraries and 13 local authorities. It is another good example of a CPF project where central and local government have worked together to use community infrastructure to improve digital literacy in communities. It has recently received additional funding to 2011 under the digital content strategy.

4.3 CAPABILITY ACTIONS

The government is responding to the capability challenges by:

ACTION	CONTRIBUTES TO PRIORITIES	LEAD AGENCY	TIMING	BUDGET
<p>Developing a unified skills strategy</p> <p>Take a unified approach to ensure New Zealand individuals and organisations can develop and use the skills needed in the workplaces of the future.</p> <p>Work to date includes building firms' capability to help managers and workers to increase their understanding of the benefits of ICT-enabled productivity and innovation and their capability to engage with and use ICT.</p>	Equipping managers with the skills needed to engage with and use ICT to increase productivity and innovation	Department of Labour and Tertiary Education Commission	A discussion document will be released for consultation with stakeholders in April/May 2008.	Baseline
<p>Implementing the National ICT Skills Collaboration (NISC) initiative</p> <p>Collaborate with industry to deliver projects to reduce ICT skill shortages, including internships, promote ICT careers, programmes to increase participation from under-represented demographics and improve communication between education providers and businesses.</p>	Reducing shortages of skilled ICT practitioners	Department of Labour	<p>Main initiatives in 2008 will be:</p> <ul style="list-style-type: none"> ▶ a mechanism to ensure identified and future priorities are resourced and delivered ▶ a national brand for ICT careers. 	Baseline
<p>Sourcing talent for New Zealand's ICT sector</p> <p>Implement an action plan to enhance the ability of New Zealand ICT companies to recruit and retain skilled migrants.</p>	Reducing shortages of skilled ICT practitioners	Department of Labour	2008-2009	Baseline
<p>Developing well qualified ICT professionals</p> <p>Improve the professional standing of ICT careers and the competencies of ICT workers. This will ensure ICT qualifications meet international benchmarks, and all ICT employees in New Zealand have access to high-quality professional development and training.</p>	Reducing shortages of skilled ICT practitioners	Department of Labour and Ministry of Education	2008-2009	Baseline
<p>Reforming tertiary education</p> <p>Ensure a tertiary education system that provides quality, relevant education and training that contributes to the government's economic developmental goals.</p> <p>Work with a selection of key organisations and businesses in the ICT sector to understand the sector's training and education requirements. This will help ensure that tertiary education investment decisions align with the needs of the ICT sector.</p>	Reducing shortages of skilled ICT practitioners	Tertiary Education Commission	From 1 January 2008	Baseline

4.4 SECURITY PRIORITY AND CHALLENGES

Security actions will be coordinated around this priority:

- ▶ **Ensuring internet and telecommunications security that is consistent with promoting New Zealanders' social and economic wellbeing and maintaining an effective network infrastructure.**

Technological developments and greater interconnectivity expose ICT systems to a variety of new threats and vulnerabilities. They raise new issues for security and suggest a need for greater awareness and new security measures for all participants in our digital future.

Feedback from interested organisations and individuals on a discussion paper on ICT security and safety in 2006 highlighted the need to:

- ▶ improve New Zealand's cyber-threat detection, reporting and response capabilities
- ▶ review New Zealand's ICT security laws in light of developments in digital technology and international treaties, such as the European Convention on Cyber Crime
- ▶ raise ICT security and safety awareness in businesses and households.⁵

BACK TO BASICS ON THE NET

In April 2008, NetSafe will launch a new online animation campaign highlighting the importance of computer safety and security. Called Net Basics, it features the Jones family, who buy a new computer and find out that online, things are 'not always as they appear'.

Net Basics pits three heroes – AntiVirus Authority (AVA), Anti Spyware Software (ASS) and the egotistical Software Update Programme (SUP) – against the evil Rapid Spawn, Pixelmania and Fiona in a battle for the Jones's family computer.

Each animation introduces a computer security concept, such as the importance of firewalls and keeping security software up to date, and is followed by clear and concise advice on that concept.

The new Net Basics campaign includes nine short animations and a website (www.netbasics.org.nz) explaining home computer security in simple terms to anyone with an internet connection.

The project is supported by CPF funding.

www.netsafe.org.nz

CONTENT

5.1 THE NEW GOAL

New Zealanders are worldclass at creating, discovering and using digital content to create value, improve their lives and communities, and enable sustainable development.

In a connected digital world where we can do almost anything anywhere, the value of being digital to the end user is in the content they create, discover and use. By improving our creation, discovery and use of New Zealand-grown content in digital form, we will be better placed to value and protect our cultural heritage, our tāonga and our sense of identity.

Opportunities are continually emerging for New Zealand businesses to enter and develop significant niche markets in global digital content, software and middleware industries. Achieving growth in these areas will diversify our export mix and reduce the importance of market proximity.

New Zealanders need to be able to easily discover and use the research and knowledge we generate as a nation. We can also match the best of our OECD counterparts by providing worldclass online government services and open access to publicly funded research publications and data.

The *Draft Digital Strategy 2.0* is directly informed by *New Zealand's Digital Content Strategy* and its framework, and builds on the challenges and actions presented in that document.

5.2 DIGITAL CULTURE PRIORITY AND CHALLENGES

Content actions on digital culture will be coordinated around this priority:

► **Improving the creation, discovery and use of New Zealand-grown content.**

In the past century, broadcasting has been a major driver in the production and delivery of New Zealand creative and cultural content to national audiences and, in more recent years, international markets. Broadcast technology is now rapidly converging with telecommunication technologies, spurring a major rethink of how we need to use the digital world to provide the best cultural content we have to offer on screen and online for New Zealanders to explore and interact with. For that to be successful, along with having effective localised discovery tools, we need continued investment in producing and digitising quality creative and heritage content.

Combined with the massive growth of audio-visual content now available online, governments, academic and commercial interests around the world are going to significant lengths to digitise and distribute vast amounts of cultural and heritage content. While a key motivation is to improve access to this content, without localised discovery tools, much of New Zealand's 'deep web' content risks being buried and therefore invisible to searchers.

In addition to shifting public broadcasting to a digital platform through the Freeview consortium, the government is reviewing the regulatory environment as part of its Broadcasting Programme of Action. The government has also made initial inroads into digitisation and discovery tools for New Zealanders through *New Zealand's Digital Content Strategy*. It is also ensuring that collecting institutions have the appropriate policies and technologies for their digital holdings and the preservation of publicly held content.

The government will build on this work by engaging further with commercial, community and public content creators and producers.

CONTENTS

5.3 DIGITAL CULTURE ACTIONS

The government is responding to the digital culture challenges by:

ACTION	CONTRIBUTES TO PRIORITIES	LEAD AGENCY	TIMING	BUDGET
Switching to digital television The analogue switch-off date will be set in 2012 or when 75% of New Zealand households have a set-top box, whichever comes first.	Improving the creation, discovery and use of New Zealand-grown content	Ministry for Culture and Heritage and Ministry of Economic Development	2012 or when household penetration is above 75%	At present, within existing baselines
Reviewing the regulatory environment for digital broadcasting and new digital media	As above	Ministry for Culture and Heritage and Ministry of Economic Development	2008	At present, within existing baselines
Launching the second Māori channel – Te Reo	As above	Te Puni Kōkiri	2008	Baseline
Developing NZ On Screen An online portal for access to archival New Zealand audio-visual content.	As above	NZ On Air	2008	Baseline
Delivering Digital New Zealand A programme to progressively enable communities around New Zealand to connect with, access and create content for digital repositories that reflect their rich histories, stories, cultures and environment.	As above	National Library of New Zealand	By 2011	\$3.3 million between 2007-2011
Developing the Kiwi Research Information Service A nationwide network of research repositories to ensure New Zealand's publicly funded research results are available online.	As above	National Library of New Zealand	By 2008	Baseline
Implementing the Digital Sustainability Strategy A strategy to ensure that electronic public records are appropriately maintained by government agencies and are accessible as public archives for as long as they are needed.	As above	Archives New Zealand	By 2011	\$1.9 million between 2007-2011



5.4 DIGITAL BUSINESS PRIORITIES AND CHALLENGES

Content actions on digital business will be coordinated around three priorities:

- ▶ **Accelerating the growth of digital businesses with competitive advantage.**
- ▶ **Increasing the use of worldclass productivity tools.**
- ▶ **Using our knowledge and research to stimulate innovation.**

New Zealand's commercial digital content industry, while currently small in global terms, has gained international success. This is most notable in the billion-dollar digital and visual effects industry, including animation and 3D graphics. Other niches are also becoming prominent, such as ehealth, elearning, eresearch and super computing.

New Zealand's reputation in these areas means there is an opportunity for industry to capture a larger share of this global market. This will require individual firms to obtain real insights into the characteristics of offshore markets, including consumer tastes, channels to market and regulatory environments. This will also require understanding of best practice in international management and of different business models.

Accelerating the growth of digital businesses will make a contribution to the economy. But more important are the leveraging opportunities of digital technologies to drive productivity and innovation throughout the economy. The smart application of digital technologies can assist in transforming our largest export sectors, such as food and beverage.

The government can also act as an exemplar in the use of digital tools that reduce search and transaction costs, such as licence applications, geospatial data and procurement, while improving opportunities for participation and engagement with New Zealanders. The government can also ensure more open access to publicly funded scientific and cultural research that is vital to stimulating innovation.

RIGHT HEMISPHERE AND NEXTSPACE

Right Hemisphere

While the company and its technology expand globally, having a significant Right Hemisphere presence in New Zealand means we gain through:

- ▶ direct economic benefits, such as retaining high-value 3D software development
- ▶ the opportunity to build and embed in New Zealand a world-class ecosystem of ancillary industries based on Right Hemisphere's 3D technology platform, which has applications in a wide range of industries
- ▶ technological and knowledge spillover, particularly in lifting local management and investor experience in taking a software firm through its exponential growth stage
- ▶ international connections, including improving links into the United States venture capital market.

With these objectives in mind, the government has provided Right Hemisphere with a US\$8 million growth capital facility for three to five years. The principal is repayable but the interest of 25 per cent per annum will be rebated if the company meets covenants and agreements relating to achieving the above gains.

The development covenant requires Right Hemisphere to undertake at least two-thirds of its global research and development (R&D) in New Zealand for the loan term. The spillover agreement covers a number of commitments from both Right Hemisphere and the government, which build on existing strengths and will help in fostering a product graphics management and related 3D graphics industry in New Zealand. The spillover agreement also secures commitments from the US investors Sutter Hill Ventures and Sequoia Capital Partners, to review selected companies' business plans.

Nextspace

Nextspace has been formed to catalyse the establishment of a 3D digital graphics cluster built around Right Hemisphere's technology platform. Nextspace's activities are centred on Right Hemisphere, its technology and access to its international customers and relationships. It aims to bring together companies that can use the technology and universities and research organisations to develop worldclass research and commercial projects.

With their strong links to the US market, and its investors and partners, Right Hemisphere and Nextspace believe they can provide business and technology coherence as well as a proven path to market for commercialising R&D. This belief reflects Right Hemisphere's strong links with key overseas partners and clients such as Adobe, SAP, NVIDIA, Bell Helicopters and Sikorsky, which form the basis of its growth aspirations to become a US\$2 billion company in what is expected to be a US\$10 billion global industry.

Government support for Right Hemisphere and Nextspace seeks to improve the chances of New Zealand realising economic development opportunities. In 2007, the government agreed to a \$7 million fund to support Nextspace's establishment. It officially opened on 28 February 2008.

5.5 DIGITAL BUSINESS ACTIONS

The government is responding to the digital business challenges by:

ACTION	CONTRIBUTES TO PRIORITIES	LEAD AGENCY	TIMING	BUDGET
Engaging with industry to identify areas where more targeted government investment could support the establishment and growth of internationally competitive digital businesses	Accelerating the growth of digital businesses with competitive advantage	Ministry of Economic Development	2008	Baseline
Implementing proposals to enhance engagement with internationalising firms This involves: <ul style="list-style-type: none"> ▶ more effective support for developing international operations ▶ intensive engagement with large firms that have significant growth potential ▶ more integrated in-market support ▶ experience-based international management education. 	Accelerating the growth of digital businesses with competitive advantage	Ministry of Economic Development and New Zealand Trade and Enterprise	2008–2009	Baseline
Reducing barriers to local firms in supplying to government This includes: <ul style="list-style-type: none"> ▶ rolling out a whole-of-government ICT procurement policy ▶ new guidelines for the treatment of intellectual property (IP) rights in ICT contracts to encourage suppliers to leverage the IP created in developing ICT solutions for government ▶ holding forums to increase New Zealand firms' awareness of how to participate in the procurement process. 	Increasing the use of worldclass productivity tools	Ministry of Economic Development	2008	Baseline
Using technology to transform the provision of government services for New Zealanders Transform government services so that New Zealanders can: <ul style="list-style-type: none"> ▶ access multiple programmes from one place at the same time ▶ use multiple channels, such as online, email, telephone and in person, to interact with government agencies without a break in service ▶ provide the same information once, rather than providing the same information to different government agencies. 	Increasing the use of worldclass productivity tools	State Services Commission	By 2010	Baseline
Delivering the New Zealand Scientific and Research Programme of Action This is a collaborative programme of action between agencies involved in commissioning and undertaking science, research and academic studies, to ensure open access to research results in New Zealand.	Using our knowledge and research to stimulate innovation	Ministry of Research, Science and Technology	2007–2011	Baseline

COLLABORATION

We saw a new spirit of collaboration at the Digital Future Summit 2.0. Participants laid down their challenges, yet they also talked about the need for ongoing collaboration. In response, we now see collaboration as the new fourth enabler of change. And we are seeing collaboration in broader terms – between communities, businesses, government, researchers and Māori, who can work together in achieving our digital potential.

The more effectively that central government, local government, businesses and communities work together, the faster broadband connectivity will happen. How can we work together more effectively? – Summit challenge

Achieving New Zealand's digital potential will require a lot of different groups to become involved. How to do it depends on you. But one thing that is certain is that the outcomes of *Digital Strategy 2.0* belong to all New Zealanders. This is about our shared future, our lives, our families and our prosperity as a nation.

6.1 MĀORI

Māori are tangata whenua of New Zealand and as the indigenous people contribute a unique world view, knowledge and culture that differentiates New Zealand from any other country. The potential for Māori development using digital technology is high – and of critical importance to our digital future.

The *2005 Digital Strategy* recognised the importance of working with Māori to achieve their goals for the use of digital technologies. The *Draft Digital Strategy 2.0* more explicitly recognises the importance of digital development to Māori wellbeing and Māori business and employment.

The *Draft Digital Strategy 2.0* confirms that Māori need to be well connected, skilled and confident creators and users of new technologies. For example, collaboration and partnership will be required around rural broadband access, skill development and the protection of Māori intellectual property. There are already some encouraging signs. The recent digital broadcasting changes encourage Māori to create and share their knowledge and heritage. EDS (an IT-outsourcing company), the Māori Education Trust, and Te Puni Kōkiri are jointly providing scholarships for Māori students of ICT in tertiary education.

But digital technology is not merely important for its economic potential. It is a vital means of transmitting mātauranga Māori, strengthening Māori identity, expressing a Māori world view and communicating with the world. Hence, it is important that cultural digital content is created in te reo Māori and maintained in accordance with tikanga Māori.

In summary, Māori are important collaboration partners because:

- ▶ Māori are significant and growing contributors to the New Zealand economy and are well positioned to meet the challenges and opportunities of the digital environment. Māori have shown a strong uptake of digital technology, which has the potential to be harnessed for wider social, economic and cultural wellbeing.
- ▶ Māori are creators and consumers of distinct digital content, particularly visible in the broadcasting, arts, education and academic arenas. This is vital to recognising Māori culture and language in a contemporary setting, and thereby informing and contributing to our unique New Zealand identity.
- ▶ Māori use digital technology to connect iwi, hapū, whānau and other tribal organisations throughout New Zealand, and overseas.
- ▶ Different approaches are required to protect, preserve and promote mātauranga Māori.

A Māori ICT forum on potential partnerships and opportunities will be facilitated by Te Puni Kōkiri in 2008.

6.2 COMMUNITIES

The *2005 Digital Strategy* recognised the intrinsic value of digital technologies in helping communities to achieve their social, cultural and economic aspirations.

The strategy has shown the importance of working collaboratively with community and voluntary sector organisations to share knowledge, interact in new and better ways, and to develop effective partnerships. Community and voluntary sector organisations have developed new digital content and created innovative digital products and networks. These provide significant economic and social benefits, as well as opportunities for their volunteers to gain skills and confidence in using digital technologies.

The Community Partnership Fund provided seed funding for community initiatives. The CPF has helped build ICT capability in the community, with many more families and organisations joining the digital world.

Community workshops and meetings were held to prepare for the refresh of the digital strategy. The following areas were proposed by community groups for further development:

- ▶ ongoing CPF funding for new digital projects and to help roll out some of the original projects nationally
- ▶ helping community and voluntary sector organisations to develop a community-wide digital strategy that will allow communities to benefit from the use of digital technologies
- ▶ giving communities better access to government (both agencies and Ministers) in order to express their ideas, share and learn about digital and technology-related initiatives, perhaps through a six-monthly forum focusing on digital communities.

6.3 BUSINESS

We will need to see collaboration between firms that operate or deliver goods and services in a digital environment, the providers of technology, and the rest of the economy.

Providers of digital technologies have a commercial imperative to collaborate. They can partner with each other in developing ICT capability, accessing finance and responding to government procurement, not to mention branding and accessing global markets. We have seen a new spirit of collaboration, particularly in the telecommunications sector, following the 2006 regulatory reforms. It was also evident at the Digital Future Summit 2.0, and it has been apparent since then. ICT firms and industry groups are now actively discussing the option of a single industry body for the ICT sector.

Firms in other sectors, such as manufacturing, tourism or farming, need to become aware of the potential of digital tools to improve productivity and how they can use them in practice. It is time to share knowledge about the application of digital tools between firms in the same industry and across different industries. Chambers of Commerce and other business groups can play an important role in disseminating knowledge. Firms will also have to work with each other, and with ICT suppliers, to adapt best-practice solutions to their needs. Leading firms can act as champions and influencers within their sector or local business community.

COLLABORATION

6.4 LOCAL GOVERNMENT

Local government has already demonstrated leadership through broadband infrastructure investment, better procurement policies, education and skills development.

Councils are well positioned to promote collaboration and partnership. They have played a key role in the successful implementation of the Broadband Challenge Fund and CPF projects.

The Local Government NZ Broadband Forum held in February 2008, drew on the energy of the Digital Future Summit 2.0. The forum attendees collectively engaged on issues such as remote or rural access to broadband, the development of digital communities, and the launch of the draft *Digital Communities Action Plan*, a great example of coordination and collaboration.

DIGITAL COMMUNITIES ACTION PLAN

The *Digital Communities Action Plan* draft framework is being developed by Local Government New Zealand and the Economic Development Association of New Zealand, as a collaborative regional plan to strengthen the digital readiness of regions and communities. Taking a cue from the digital strategy refresh, the workstreams of the action plan map to the key themes of the refresh.



RESEARCH AND EVALUATION

A 'digital community' is a connected community that combines broadband communication, infrastructure and innovative services to meet the needs of government, business, education and citizens to increase economic vitality and enhance the wellbeing of communities. The plan is a whole-of-community initiative designed to meet the challenges of developing a nationwide broadband economy.

6.5 RESEARCHERS

The *2005 Digital Strategy* recognised the importance of having an advanced network spanning New Zealand and connecting researchers with each other and their colleagues overseas. Thanks to the Kiwi Advanced Research and Education Network, the vision has become a reality.

Research underpins innovation. The *Draft Digital Strategy 2.0* acknowledges researchers' need for advanced computing tools and technologies. Real-time connectivity enables researchers to become confident global collaboration partners in achieving New Zealand's digital goals.

The *Draft Digital Strategy 2.0* supports the development and exploitation of e-research (real-time data sharing in research, science and technology using web based tools). By supporting the creative digital use and re-use of research information, New Zealanders will have the opportunity to access knowledge anytime, anywhere. New digital tools and middleware⁶ will support access to knowledge and enable economic transformation.

6.6 THE OVERARCHING SECTOR FORUM

For partnerships to succeed, collaboration must be driven by the participants. The government has consulted with ICT sector representatives and broader interest groups, community organisations and individuals and agreed to support the establishment of an 'overarching forum' for members to work with each other and collectively with the government on digital strategy related initiatives. Funding of \$825,000 will be provided for the design, establishment and initial operation of the forum for each of the first two years (2008-09 and 2009-10). Annual funding of \$400,000 will be provided in the following years.

The forum's members will represent communities, local government, industry, Māori, researchers and academia. Its purpose and functions will be to:

- ▶ initiate, coordinate and support collaborative projects, with or without government input and funding, to address digital issues, such as community-based ICT skills or building ICT capability in voluntary and charitable organisations
- ▶ provide a forum for dialogue with government and other stakeholders on digital issues
- ▶ facilitate the sharing of knowledge and lessons from successful projects.

The forum is likely to consist of a national council of all members, an elected executive board, with an independent chair, an executive director and a small secretariat. The substantive work of the forum, especially projects and advice on specific issues, will be carried out by working groups comprising sub-groups of forum members, supported by the executive director and staff.

Please share your views with us on this body as it develops further. In particular, what would you like to see the forum focus its work programme on?

⁶ Middleware is the 'glue' that connects the advanced network (KAREN) with its software applications, i.e. tools.

COLLABORATION

COLLABORATION ACROSS GOVERNMENT // // // //

The *2005 Digital Strategy* has been the key organising document for government action in the digital space over the past three years. A number of government strategies have been released in that time that build directly on the challenges and actions of the strategy. The key ones are:

e-Government Strategy

www.e.govt.nz

The *e-Government Strategy* is the all-of-government approach to transforming how agencies use technology to deliver services, provide information and interact with people as they work to achieve the outcomes sought by government. It sets out how government will carry out its obligations under the digital strategy and how technology will be used in achieving the Development Goals for the State Services.

New Zealanders' experience is at the heart of government and is the cornerstone to delivering our digital future. In order to deliver effective government services, the government is engaging with New Zealanders to inform the design and delivery of government services. The State Services Commission's Kiwis Count survey and Guide to Online Participation are key tools of the engagement framework. Equally important is ensuring that there are technology services that enable government agencies to join up and work together.

The strategy recognises technological innovation is transforming our world and focuses on government meeting the challenges this creates. New Zealanders expect government to interact with them using the new technologies they are familiar with in other parts of their lives – social networking websites and tools, as well as the full range of digital channels and internet pathways. It also acknowledges that government must remain inclusive, making sure that those who cannot or will not use these new technologies can still be engaged.

The strategy looks ahead to the digital future of government. New ways of joining up information held by government and others to provide better services and user-friendly access to authoritative information on New Zealand issues, places, events and people will have a significant impact. Government-held information is increasingly available in digital form. Better information will encourage public debate on issues and greater participation in the design of policies and how they are delivered. Information ownership and access will continue to be key issues.

New Zealand's Digital Content Strategy

www.digitalcontent.govt.nz

Launched in 2007, *New Zealand's Digital Content Strategy* aims to make New Zealand visible and relevant in a connected digital world. It aims to ensure that we are innovative, informed and capable in telling our stories, experiencing our heritage and cultures, and creating our digital future. To that end, an important starting point for the content strategy is recognising that the value of content is in what it delivers and enables for end users. The strategy presents the key digital content influences in New Zealand's environment, an analysis of digital content issues and the digital content challenges that face us as a nation. The first steps towards creating a digital New Zealand are outlined in a series of government actions, while related actions from other strategies that contribute directly to the outcomes of this strategy are identified.

The availability of unique New Zealand content will also help drive demand for broadband, improve the return on investment in capability and create opportunities for commercial use.

New Zealand Geospatial Strategy

www.linz.govt.nz

Launched in 2007, the *New Zealand Geospatial Strategy* is designed to improve knowledge of and access to the geospatial assets owned, maintained or used by government. It recognises government's increasing reliance on geospatial information for a wide range of activities – from emergency services and national defence to utilities, resource management, biosecurity and economic development.

The purpose of the geospatial strategy is to:

- ▶ define the approach needed to ensure New Zealand's geospatial information infrastructure meets the ongoing business needs of government
- ▶ provide the framework for the leadership and direction needed for managing geospatial information
- ▶ optimise the collective benefit from public investment in geospatial infrastructure
- ▶ ensure quality fundamental geospatial data is available to all.

Public Broadcasting Programme of Action

www.mch.govt.nz

The government's Public Broadcasting Programme of Action outlines six priorities to guide public broadcasting policy development to 2010, which are:

- ▶ achieving adequacy and certainty of public funding for broadcasting
- ▶ strengthening public broadcasting
- ▶ facilitating the successful development of digital broadcasting services
- ▶ enhancing regional and community broadcasting
- ▶ enhancing independence and responsibility in broadcasting
- ▶ enhancing the incentives for producing higher-quality content and schedules.

ICT Strategic Framework for Education

www.minedu.govt.nz

The ICT Strategic Framework for Education aims to improve learner achievement in an innovative education sector, fully connected and supported by the smart use of ICT. The framework seeks to deliver this vision through:

- ▶ a more learner-centred education system transcending organisational boundaries
- ▶ more informed decision making within the education sector by learners, teachers, parents, communities, public, businesses, researchers, policy makers and administrators
- ▶ increased ease and opportunity of access and reduced compliance costs for all participants
- ▶ increased confidence, capability and capacity from the use of ICT by all participants in the education sector

- ▶ greater opportunities for the generation, application and sharing of new ideas and technologies
- ▶ more effective and efficient investment in ICT by education sector government agencies.

This work has already resulted in greater discoverability and access to electronic learning materials through a federated search system allowing a single search across materials in New Zealand, Australia and the United States and will be extended to an even broader set of New Zealand and international resources. Role-based authentication and authorisation is also ensuring that information and content remain protected where necessary.

Health Information Strategy for New Zealand

www.moh.govt.nz

The *Health Information Strategy for New Zealand* provides a direction for the health and disability sector to improve information management and information sharing, to underpin better health and disability outcomes for New Zealanders.

To get better outcomes for New Zealanders, the delivery of health and disability services in New Zealand needs to focus on working smarter. If we want to work smarter then better information is our lifeblood. To make effective, informed decisions about targeting services, we need quality information. Decision making occurs in all areas of the sector, and appropriate information needs to be available at the right time and place, in the right format.

New Zealand Research Agenda

www.morst.govt.nz

The *New Zealand Research Agenda* (NZRA) signals the policy direction for New Zealand's research, science and technology (RS&T) investments and activities towards 2020. The areas of focus for the NZRA include engagement with community, business and RS&T organisations. The NZRA provides guidance on how RS&T can be effectively used to address New Zealand and global challenges.

ACHIEVING OUR DIGITAL POTENTIAL

7.1 WHAT WILL IT TAKE?

Digital technologies are rapidly changing the world. They are changing the way we do business, build communities, experience our cultures and think about our long term future. What is not changing so fast, however, is our ability to understand and act on the potential of these changes.

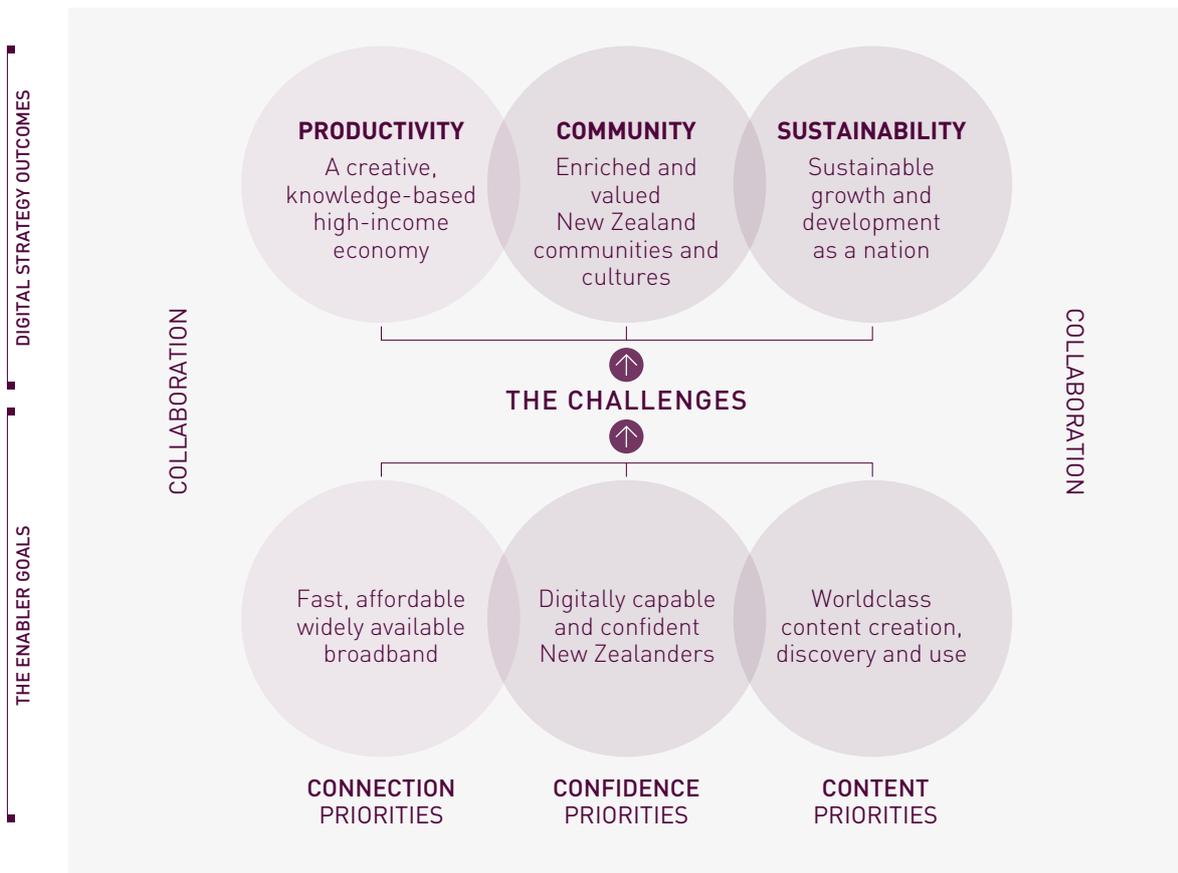
A mindset change to adopt technology and 'be digital' is needed across New Zealand to take us forward. How do we do this? – Summit challenge

Connection, confidence and content are the critical enablers for our digital future. Collaboration in the digital space is more vital than ever. But for us to achieve our digital potential as a nation, we need to think differently about the kinds of outcomes possible from our use of digital technology.

The Summit challenged all of us to define and capture the benefits that living and working in this digital society will bring. We have crystallised those key benefits (or "outcomes") into three areas:

- ▶ productivity
- ▶ community
- ▶ sustainability.

Achieving our digital potential



ACHIEVING OUR DIGITAL POTENTIAL

This chapter provides you with an opportunity to rise to this challenge. We want you to tell us how you can use digital technology to bring enormous benefits in the three areas identified.

To help you make a contribution, action tables are provided at the end of each of the following outcomes – productivity, community and sustainability. We need you to help complete these tables. A few examples have been provided to help kick-start this process and give an indication of the types of action possible.

The next chapter – Have Your Say – outlines the process for participating in the online discussions, wiki and submission process.

7.2 PRODUCTIVITY: ACHIEVING A CREATIVE, KNOWLEDGE-BASED, HIGH-INCOME ECONOMY

Digital innovation, technology-based productivity solutions and worldclass ICT-based skills and training are vital to achieving our digital potential and improving New Zealanders' quality of life.

Increasing productivity and innovation is a key to transforming our economy. How can digital technologies be leveraged in the quest for higher productivity? – Summit challenge

Innovative digital exports

There are major export opportunities for innovative New Zealand digital content and services. Right Hemisphere is an excellent example of innovation in 3D digital graphics and applications. The time is ripe to build on this and the successes of other kiwi firms. Part of the challenge is to identify and select the niches in which we have competitive advantage in the global environment. Connecting the digital commercial opportunities with New Zealand's cultures and lifestyles to increase both social and economic value is a particular challenge for our creative and media industries, as well as for our small innovative start-ups.

Research and development of worldclass digital technologies such as in the pastoral and food industry will play a major role in the future growth of the largest sectors of our economy and in the development of new, smart and innovative businesses.

Productivity growth

We know that New Zealand is being held back by its low productivity. Digital technologies are key to solving the problem and improving our living standards. Using digital-based technology and broadband throughout the whole economy, as a contributor to business innovation, productivity improvement and the process of becoming more internationally competitive, is the way to get the biggest payoff. The Economist Intelligence Unit surmised that New Zealand could boost its GDP by \$13.1 billion by 2030 (10 per cent of current GDP) if it could move into the top quartile for broadband performance in the OECD by 2015.⁷ The challenge is for industry sectors and individual firms, large and small, to coordinate their efforts around better digital technology utilisation.

Action table

The following table lists actions where the use of digital technology can assist in improving our productivity. A couple of examples are included but your contribution is needed to fill out this table.

ACTION	LEAD	TIMING	BUDGET
The establishment of Nextspace to accelerate digital exports in 3D graphics	Ministry of Economic Development	2008-2010	\$7 million
Develop the Business Portal as the universal gateway to government for business	Ministry of Economic Development	2008-2009	Baseline
...
...
...

BRINGING ICT PRODUCTIVITY SOLUTIONS TO THE FARM GATE

Farmgate is an agricultural ICT research initiative that seeks to improve the efficiencies, productivity and marketing of New Zealand primary sector products through innovative uses of ICT. Launched by independent research company MediaLab in 2004, Farmgate has drawn in government funding partners, cross-sector partnerships and farmers themselves to create innovative farming solutions.

Farmgate’s Remote Effluent Monitoring System for dairy farmers involves Massey University, Telecom and BayCity Technologies. It is essentially a productivity solution that also helps to manage a farm’s environmental sustainability. Information collected at farm monitoring sites can be distributed via mobile and wireless networks and can be accessed by farmers via website, email or text message.

“Effluent is a resource on a dairy farm – when applied properly, it aids pasture growth and ultimately leads to increased milk production,” says MediaLab’s CEO Phil Shepherd. “But if distributed at the wrong time, it can pollute both groundwater and streams. The remote effluent monitoring tool will be demonstrated at field days in 2008 and be taken to the market later in the year.”

7.3 COMMUNITY: ENRICHING AND VALUING NEW ZEALAND COMMUNITIES AND CULTURES, AND PROMOTING OUR UNIQUE NATIONAL IDENTITY

Our prosperity as a nation depends on our people – so our digital future must contribute to the needs and aspirations of all New Zealand communities and enhance their wellbeing. In a digital age, we need to consider how we reflect on, experience and value the identities, cultures and histories of New Zealanders, along with how we protect and care for our digital heritage and traditional knowledge.

ACHIEVING OUR DIGITAL POTENTIAL

Prosperous communities

The government has invested in improving outcomes for communities through the Broadband Challenge and the Community Partnership Fund. These have already produced a diversity of community-driven responses, from legal aid videoconferencing and chronically ill children remotely accessing specialists and support groups, to community digital-story telling and heritage building. One of the strongest outcomes of these funds to date is to challenge communities to think differently about how they work together to use digital technology, how they can create a critical mass of demand for attracting technology investment, and how they support their community members through acquiring digital literacy and confidence. Ensuring government and business work effectively together with communities to reach their potential is a key part of this challenge.

Valued cultural identity

For much of the last century, public broadcasting has been an important way of delivering material to New Zealanders that helps to define and reinforce our sense of identity and enables us to play active roles as citizens. Our libraries, museums and archives care for the collective memories of our nation, while marae are often the seat of mātauranga Māori and tāonga. The digital age provides new opportunities for preserving and presenting our history and culture in digital form, but it also creates new risks, such as a loss of visibility in an ocean of international digital content. One part of the challenge is to address how individuals, businesses and communities create, discover and use this valuable New Zealand content to enhance our digital potential. We also need our performing arts and creative industries, as major local content creators and providers, to find new ways of reaching and connecting with audiences in the digital environment.

Action table

The following table below lists actions where the use of digital technology can assist in enriching and valuing our communities and cultures. A couple of examples are included but your contribution is needed to fill out this table.

ACTION	LEAD	TIMING	BUDGET
Digital Communities Action Plan	Economic Development Association of New Zealand, Local Government New Zealand	tbc	tbc
Canterbury Pasifika – promoting the benefits of ICT to Pacific peoples in New Zealand	Canterbury Pasifika Limited	ICT audit to be completed by mid 2007, to inform the development of a Pasifika eLearning Centre and a Christchurch Pasifika eStrategy	received CPF funding of \$142,266
...
...
...

COMMUNITIES IN THE DIGITAL FUTURE

The 2020 Communications Trust is an excellent example of responding to the importance of communities in the digital future of New Zealand.

The Trust was established in 1996, initially under the Wellington City Council's InfoCity project. Since then it has expanded nationally through a number of highly acclaimed initiatives, each with a focus on empowering people to use ICT as a pathway to engage more fully in their communities, their countries and in today's global village.

The ongoing aim of the Trust is to promote dialogue and understanding through local action. Separate regional trusts have been established to ensure local responsiveness and collectively operate under a common mission to help all New Zealanders benefit from the opportunities of the new digital era – especially from the internet.

www.2020.org.nz

7.4 SUSTAINABILITY: USING ADVANCED TECHNOLOGY TO ACHIEVE SUSTAINABLE GROWTH AS A NATION

Sustainability is about ensuring our quality of life and prosperity for current generations, without limiting the ability of future generations to meet their needs. In our digital future, we will see governments, businesses and individuals changing their production and consumption habits while becoming more energy efficient to slow the release of carbon emissions into the atmosphere.

The issue of sustainability is affecting every part of our economy and society. How can digital solutions be leveraged to help us achieve our sustainability goals? – Summit challenge

Smart, sustainable technologies

Digital technologies can make a significant contribution to improving New Zealand's environmental sustainability. Redesigning ICT hardware and systems along with smart procurement policies are already a high priority and can improve efficiency. Digital technologies also provide essential tools for businesses to accurately assess, document and communicate information on the sustainability of their products and services to concerned consumers around the globe.

Digital technologies can:

- ▶ reduce the need for travel through broadband enabled teleworking and videoconferencing
- ▶ improve transport network efficiency with, for example, intelligent transport management systems that manage traffic flows using priority bus signals assisted by global positioning systems (GPS) and electronic ticketing that reduces boarding time
- ▶ help in developing smart energy networks for electric vehicle recharging
- ▶ improve the efficiency and reduce the environmental footprint of our largest production sectors such as food and beverage, pastoral systems and forestry.

Digital content and digital tools can enable us to do many things faster, with better quality information, using fewer resources. But we must also consider the increase in ewaste and electricity consumption created through the digital revolution. The challenge is to improve the environmental sustainability of the digital technologies we use and to use technology effectively to reduce resource consumption.

Action table

The following table lists actions where the use of digital technology can assist in achieving sustainable growth. A couple of examples are included but your contribution is needed to fill out this table.

ACTION	LEAD	TIMING	BUDGET
Carbon accounting and greenhouse gas emissions measurement.	Ministry of Agriculture and Ministry for the Environment	Ongoing	Baseline
Advanced Metering Project – to ensure that there is an appropriate regulatory regime to support the widespread introduction of smart meters.	Electricity Commission	2007-2010	Baseline
...
...
...

SUSTAINABLE ENERGY MANAGEMENT

The next revolution in electricity management will bring digital solutions centre stage in New Zealand homes. New Zealand's electricity system already relies on precise digital technologies to report instant changes in electricity demand throughout the country back to the central system operator, resulting in real-time increases or decreases in power generation from the country's large hydro and thermal plants. It is a 24-7 balancing act to ensure a constant flow of electricity down the wires.

'Smart meters' are being developed and trialled by several companies in New Zealand homes that collect half-hourly electricity consumption information. Eventually, consumers will have real-time information about their electricity use – and possibly different price signals at peak and off-peak times of the day.

With information, price incentives and automated technologies on power-hungry devices such as dishwashers, consumers can spread out their demand. This will help smooth the nationwide daily peaks in electricity consumption, which at the moment are fuelled by carbon-intensive coal. This is only possible with digital technology solutions.

7.5 RISING TO THE CHALLENGES

Digital Strategy 2.0 is about taking the next step into our digital future and, in doing so, achieving our digital potential. We are a small nation with some unique opportunities and advantages when it comes to digital technologies. *Digital Strategy 2.0* is challenging us all to identify those opportunities and advantages, and to collaborate to be digital. We all need to rise to the challenges.

HAVE YOUR SAY

We encourage you to highlight issues and opportunities that may have been missed in this draft document, and to propose actions and policies available to the collaboration partners to rise to the challenges and achieve our digital potential.

To have your say you can:

1. View the *Draft Digital Strategy 2.0* online at www.digitalstrategy.govt.nz and participate in the online discussions provided at the end of each chapter.
2. Participate in the digital strategy wiki at www.digitalstrategy.govt.nz/wiki where you can make suggested edits and add comments.
3. Provide your response via a submission form, which can be downloaded and/or filled in online at www.digitalstrategy.govt.nz/submission. The questions set out in the submission form are also available below.
4. Written submissions may also be provided by:
 - ▶ Email to submission@digitalstrategy.govt.nz
 - ▶ Post to Digital Strategy 2.0 Submission
Digital Development Group
Ministry of Economic Development
P O Box 1473
Wellington
 - ▶ Fax 04 499 0969

Note: The preferred format for submissions is electronic, either via the submission form or via email.

Submissions close at 5.00pm on Monday, 12 May 2008.

Confidentiality and the Official Information Act

Respondents should note that written submissions or comments provided to the Ministry of Economic Development on the *Draft Digital Strategy 2.0* will be subject to the Official Information Act (OIA) 1982. The OIA requires information to be made available unless there is good reason, pursuant to the Act, to withhold the information, and that good reason outweighs the public interest in making the information available.

If you want information that you provide to be treated as confidential, please clearly identify the material and explain to us why you believe the information should be withheld under the provisions of the OIA.

Questions

To assist you in shaping your views, we are particularly interested in your responses to the following questions.

This form can be downloaded or filled in online at www.digitalstrategy.govt.nz/submission. For a faxed or mailed copy please contact Lisa Bond at 04 474 2911 or submission@digitalstrategy.govt.nz.

HAVE YOUR SAY

ON CONNECTION

What do you think of the new connection goal – is it ambitious enough?

What other key priorities in this focus area (if any) would you like to see considered?

How well do the identified challenges and actions contribute to achieving the priorities?

What other specific challenges and actions (if any) do you think should be considered?
By whom and by when?

ON CONFIDENCE

What do you think of the new confidence goal – is it ambitious enough?

What other key priorities in this focus area (if any) would you like to see considered?

How well do the identified challenges and actions contribute to achieving the priorities?

What other specific challenges and actions (if any) do you think should be considered?
By whom and by when?

ON CONTENT

What do you think of the new content goal – is it ambitious enough?

What other key priorities in this focus area (if any) would you like to see considered?

How well do the identified challenges and actions contribute to achieving the priorities?

What other specific challenges and actions (if any) do you think should be considered?
By whom and by when?

ON COLLABORATION

How important do you think collaboration across sectors is to achieving our digital potential?

Apart from the ones already identified, what other collaboration partners or sectors (if any) are vital to achieving our digital potential?

What unique contribution do you see for Māori, for communities, for business groups, for local government, for researchers or for other contributors you identify as having a key role?

What would you like to see the overarching sector forum focus its work programme on?



ON ACHIEVING OUR DIGITAL POTENTIAL

Using digital technology, what contribution will you make to improving our productivity (achieving a creative, knowledge-based, high-income economy)?

Using digital technology, what contribution will you make to enriching and valuing New Zealand communities and cultures, and promoting our unique national identity?

Using digital technology, what contribution will you make to achieving sustainable growth as a nation?

What contribution do you think others need to make to achieve our digital potential?

OTHER COMMENTS

Do you have any further suggestions or comments?

EVALUATION

The final *Digital Strategy 2.0* will include an evaluation framework that will involve contributions from collaboration partners and possibly the proposed overarching sector forum. The government will set the framework and include specific processes to monitor the progress and outcomes of government actions identified in the strategy.

GLOSSARY

ADSL/DSL/naked DSL	(Asymmetric) digital subscriber line is a data communications technology that enables faster data transmission over copper telephone lines. 'Naked' refers to the fact that customers no longer need a telephone connection to access the internet.
Blog	Weblogs, usually shortened to 'blogs' are internet-based published journals or article sites, usually organised by chronological entries.
Broadband	A method of two-way transmission for high-speed, high-capacity internet and data connections. Many times faster than dial-up, a broadband internet connection can be provided by ADSL, cable modem, satellite, ISDN or wireless technologies.
Broadband Challenge Fund (BBC)	A contestable fund under the digital strategy that, through supporting partnerships, aims to accelerate the provision of affordable broadband services to regional centres, and rural and under-served communities and businesses.
Carbon neutral	A term applied to individuals, businesses or organisations whose practices contribute zero carbon dioxide emissions to the atmosphere.
Community Partnership Fund (CPF)	A contestable fund under the digital strategy that provides seed funding for up to 50 per cent of partnership initiatives that will strengthen communities and improve people's capability and skills to use ICT and develop digital content.
Demand aggregation	In the context of the digital strategy, the pooling of demand for broadband services by communities and/or businesses in a region so that a business case for broadband investment in that region is made more attractive.
Development Goals for the State Services	The Development Goals for the State Services provide a framework for delivering the next generation of state services. It aims to see public services networked, coordinated, accessible, trusted, employers of choice and providing value for money.
Digital divide	The gap between those people with effective access to digital and information technology and those without access to it. It includes the imbalances in geographical and physical access to technology, as well as those in resources and skills needed to participate effectively. The term also increasingly refers to the divide between the digitally savvy and those who are not aware of how digital technology can enhance business and personal lives.
Digital future	The state where the goal of the digital strategy is achieved – that is "New Zealand will be a world leader in using information and technology to realise its economic, social, environmental and cultural goals to the benefit of all New Zealanders". This is consistent with the messages from the Digital Future Summit 2.0.
Digital Future Summit 2.0	Held in November 2007 and attended by around 540 people, a checkpoint for contributions to the refresh of the digital strategy from key community, youth, research, education, business, and local and central government stakeholders.
e-Government Strategy	The all-of-government approach to transforming how agencies use technology to deliver services, provide information and interact with people as they work to achieve the outcomes the government seeks.
FTTN	Fibre-to-the-node (or fibre-to-the-cabinet): enables broadband services to be delivered using optical fibre that runs to a cabinet serving a neighbourhood. Customers then connect to this cabinet using traditional copper wiring.
Generation Y	The generation born from 1979 to the late 1990s who are more technology savvy than previous generation.
ICT	Information and communications technology: a general term used to group computer and telecommunications technologies.
Innovation economy	The innovation economy is based on intellectual capital, and the ability to translate ideas into new technologies, products and services faster and better than the competition.
IPTV	Internet protocol television is a system where digital television services are delivered over the internet.
ISDN	Integrated services digital network: a telephone network system designed to allow digital transmission of voice and data over ordinary telephone copper wires.

GLOSSARY

KAREN	Kiwi Advanced Research and Education Network: an ultra-fast, high-bandwidth advanced network (internet) facility that the research and education sectors use to enable exchange of data in real time.
Kbps, Mbps, Gbps	Kilobits per second, Megabits per second, Gigabits per second: used to describe data transfer speed, e.g. 56Kbps dial-up, 10Mbps broadband.
KB, MB, GB	Kilobyte, Megabyte, Gigabyte: used to describe units of size and data storage, e.g. 500KB file, a 160MB disk, a 120GB hard drive.
Local loop unbundling (LLU)	The regulatory process allowing multiple telecommunications and internet service providers to use the incumbent telecommunications company's local exchanges and access the copper wire telephone network at wholesale rates.
Middleware	Software designed to integrate separate software and/or hardware systems. Middleware provides the communication between the separate systems.
MUSH entities	Municipalities (local government), universities, schools and hospitals.
Podcast	A collection of digital media files distributed over the internet for playback on portable media players and personal computers.
Refresh process	The process of updating and progressing the digital strategy. We note that the term 'refresh' has been used in other policy areas, although the context here is slightly different.
Repository	A central location for storing digital library collections, databases and files, often for access over a network or the internet.
Rich content	Also known as multimedia, a term for media that uses multiple forms of information content and information processing (e.g. text, audio, graphics).
RSS	Really simple syndication: a popular technology for notifying users of updates to content in a website, blog or internet TV.
Tag cloud	A tag stores information about a document, image or other online content to help searching. A tag cloud is a set of related tags with popularity of the tags represented using different font sizes or other visual clues.
Telco	Telecommunications company. Includes internet service providers, mobile and fixed line telephone companies, and data network providers.
Tertiary education organisations (TEOs)	A public, private or community-based organisation, offering tertiary education or tertiary-related services. They include universities, polytechnics, colleges of education, specialist colleges and formally established wānanga.
TSO	Telecommunications Service Obligations: a regulatory mechanism which enables telephone services to be made available to households that would not usually receive services due to economic viability.
VoIP	Voice over internet protocol: a protocol optimised for sending voice through the internet. VoIP is often used abstractly to refer to the actual transmission of voice (rather than the protocol implementing it). VoIP is also known as IP telephony, internet telephony, broadband telephony, and voice over broadband.
Web 2.0	Refers less to new web technology but to changes in the ways software developers and end users use the web to network, collaborate and innovate.
Weightless sector	Attributed to economist Danny Quah, covers economic activity relating to: ICT, including the internet; intellectual property, including not only patents and copyrights but, more broadly, name brands, trademarks, advertising, financial and consulting services, medical knowledge and education; electronic libraries and databases, including new media, video entertainment and broadcasting; and biotechnology.
Wiki	A webpage that allows users to add, edit and update content collectively or collaboratively.
WiMAX	Worldwide Interoperability for Microwave Access: the industry term for a long-range wireless networking standard. WiMAX technology has the potential to deliver high-speed internet access to rural areas and other locations not serviced by cable or DSL technology. WiMAX also offers an alternative to satellite internet services.

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