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Report to:

Te Puni Kōkiri

IMPACT OF ACCESS TO BROADBAND AND POTENTIAL IMPACT OF ULTRA-FAST BROADBAND ON MĀORI ORGANISATIONS

CASE STUDIES

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Impact of access to broadband and potential impact of Ultra-Fast Broadband on Māori organisations

Case studies

1 Introduction to the case studies

These case studies have been prepared by BERL for Te Puni Kōkiri on behalf of Ngā Pū Waea, the National Māori Broadband Working Group. The broad role of Ngā Pū Waea (NPW) is to assist in ensuring Māori communities can be connected in a timely and efficient manner, and to maximise opportunities arising from the deployment of broadband.

1.1 Aim of the case studies

This report provides some insights into the impact of broadband and the potential impact of Ultra-Fast Broadband at a grassroots level, literally in some cases. The case studies focus on the real impacts and benefits gained from access to broadband and potential impacts of Ultra-Fast Broadband. They also explore the potential future benefits for Māori organisations from access to broadband and Ultra-Fast Broadband.

Richard Jones, Poutama CEO, says "I have seen significant gains from moving from dial-up to broadband and know that moving to Ultra-Fast Broadband will see considerable gains for my team and our clients".

The case studies were selected from a broad range of activities, including business, community, collectives, forestry, health and ICT. Some of the businesses are not familiar to NPW and will provide some new insights into connectivity. There are limitations to the case studies, as six organisations does not represent the totality of Māori organisations; however, they do provide a strong foundation of information on the uptake and roll out of broadband and Ultra-Fast Broadband.

1.2 What is broadband and Ultra-Fast Broadband

Broadband and Ultra-Fast Broadband is a technology that allows data to be transmitted at high speeds between the internet and applications on computers in the 'cloud' and your computer or mobile phone. [1] It allows a greater volume of data to be transmitted much more quickly than dial-up internet because it can handle a greater range of frequencies or, in geek

[1] Broadband is defined by the International Telecommunications Union as a service which provides transmission capacity in excess of 2.0 Megabits per second (Mbps). Ultra Fast Broadband is generally defined as services which deliver much faster speeds, in excess of 25 Mbps. For the purposes of the New Zealand Government's Ultra-Fast Broadband initiative, having access to Ultra-Fast Broadband is taken to mean the availability of broadband services at a minimum speed of 100 Mbps Downstream (from the Internet to the user) and a minimum of 50 Mbps Upstream (from user to the Internet). It should be noted that the Government's Rural Broadband Initiative will deliver broadband peak speeds of at least 5 mbps (this is commonly referred to as fast broadband or high-speed broadband) to 86% of rural homes and businesses. Unless otherwise stated, the case studies consider the impact of Ultra-Fast Broadband.

speak, a higher bandwidth. This is where the term broadband comes from.[2] It means people and information are connected to the rest of the world without moving, and that data, lots of data, can move around the world really quickly.

[2] Alcatel, Lucent, 2010. Understanding the next generation of Ultra-Fast Broadband in New Zealand.

2 Key observations from the case studies

The six case studies provide insight into the real impacts and benefits that have been achieved through access to broadband. It is clear that broadband can provide contact with a wide range of resources, services, and products that can be useful in daily life, improving efficiency and productivity.

Broadband has enabled the use of video, audio and data-intensive applications. This has further permitted greater teleworking, telepresence and connection to clients and markets. Moving into the future, this could bring further benefits to a wide number of organisations of interest to Māori, including health, tourism, agriculture, ICT business services, and industries competing in global markets where product quality, innovation and connection to customers is critical.

Ian Taylor, CEO of Animation Research Ltd, says he vividly remembers in 1957, when he was seven years old, and electricity arrived in his town. The sheer wonder of turning on the lights for the first time in their house, he thought that if you could do that with a flick of a swICTh just imagine what else is possible. From that day onwards he was hooked to the endless possibilities that can be achieved by embracing new technologies.

2.1 Gains from access to broadband

All of the case study participants have experienced positive impacts with access to broadband and are anticipating significant further gains when moving to Ultra-Fast Broadband. These gains include:

Increased mobility of staff

Having access to faster internet services has enabled the case study participants to move away from staff being based in the office every day. This mobility has ensured that staff can be closer to their clients, and that organisations can continue to employ staff to work remotely. This has created greater flexibility and options for staff and employers.

Increased flexibility

The other side of the coin is that it has created opportunities for staff to stay in the office. They do not waste time travelling to sites to collect or deliver data and documents. It has also enabled staff to meet with clients without physically travelling to the client.

Access to new technology

Broadband provides access to new telecommunications technologies in video and data intensive applications such as Skype to communicate with staff and clients. It has created access to new technologies such as e-commerce, cloud computing and various software programmes to improve the efficiency and speed of doing business.

Improved information sharing

Broadband has enabled significant improvements in information sharing with staff, clients and whānau. The time advantage has been increased with speedy access to information, on demand, when needed. Huge volumes of information transfers have been made possible through broadband.

Economic development and e-Commerce opportunities

In some of the case studies broadband has promoted economic development by creating new job opportunities and access to new industries. It has also supported Māori culture through electronic commerce, by providing a portal to information in one place, on a regular basis, for whānau all over the world.

Cost savings

Access to broadband enables some of the case study participants to run multiple projects at the same time leading to significant cost savings. They are able to access time-saving software and information online, which reduces their transaction costs and saves on expertise costs. The case study participants stressed the importance of constantly exploring the best way to use new technology to make the business more efficient.

2.2 Ultra-Fast Broadband readiness and awareness

The case studies illustrated the advantages of broadband; however there is a lack of awareness on the advantages of moving to Ultra-Fast Broadband for the respective organisations. All case study participants recognised that access to broadband is a crucial part of doing business, and almost all of the case study participants think that Ultra-Fast Broadband will be a necessity in the future to enable them to maintain and compete within the market and deliver the best services to their clients. Exactly how that will be achieved is not clear to the case study participants.

Significant difference between rural and urban user demands

Rural case study participants were more frustrated with ensuring access to reliable broadband than in access to Ultra-Fast Broadband. They were interested in ensuring a reliable source of broadband and were less enthusiastic about access to Ultra-Fast Broadband.

For the urban case study participants, the focus was on the cost of switching from broadband to Ultra-Fast Broadband. The cost component will have a significant bearing in their decision to move from broadband to Ultra-Fast Broadband.

Māori businesses awareness on the gains from Ultra-Fast Broadband

World Bank analysis published in 2009 suggests that investment in broadband infrastructure has the greatest effect on nationwide productivity of any form of telecommunications. The case studies support this statement with significant gains in flexibility of staff, new technology, information sharing and new business opportunities through access to broadband.

The following sectors were identified by the case study participants as future winners from the roll out of Ultra-Fast Broadband:

Māori organisations in the health sector

There are significant potential uses of Ultra-Fast Broadband within the health sector. Some of these uses include access to online technology which allow patients to self-monitor their health in the home with appropriate medical oversight; electronic patient health records which are securely stored and universally accessible to authorised medical practitioners; and the electronic transfer of advanced medical images such as those used for radiology and pathology.

Māori SMEs

Key business activities such as communication, collaboration, process enhancements and transactions will be made even easier and faster with access to Ultra-Fast Broadband. Applications such as online conferencing, social networking, cloud-based computing and e-commerce will be easier and more accessible through Ultra-Fast Broadband. One of the most important aspects of access to Ultra-Fast Broadband might be that a small Māori business can achieve operational scale more quickly by accessing new markets and opportunities previously only available to larger suppliers.

E-commerce solutions eliminate geographic barriers to getting a business's message and product out to a broad audience, especially in New Zealand where a significant proportion of the population buy online. The World Internet Project showed that 72% of New Zealand Internet users buy things online.[3] Māori are well placed to take advantage of these new technologies to support and develop new business opportunities.

Māori agricultural business

Connectivity and the ability of farmers to access real-time information is becoming a crucial part of the industry. Ultra-Fast Broadband will offer opportunities for farmers to gather data and use it to make productivity gains faster and more frequently.

Farmers will benefit from the ability to share greater volume of information and make use of innovative software being developed both in New Zealand and overseas. Ultra-Fast Broadband will offer the opportunity for cloud computing to the agricultural industry. Farmers will be able to use and save data on the internet, instead of having to buy and install software on their computer's hard drive. This means that information can be accessed by authorised people anywhere and anytime, and farmers won't have to update software.

[3] New Zealand is one of 30 countries involved in the World Internet Project – a longitudinal study that enables comparisons of Internet use across countries. AUT University, with funding from the National Library of New Zealand and from Internet NZ, conducted its first survey in 2007, the second in 2009 and the most recent in 2011. This is the results from the 2011 survey.

3 Case Studies

The section that follows showcases the impact of broadband and/or the potential impact of Ultra-Fast Broadband on six Māori organisations from a wide spectrum of the Māori economy.

3.1 Poutama

Poutama is an independent charitable trust established in 1988 to provide business enabling services to Māori. Income generated from its investments enables Poutama to engage in activities and provide services that support and facilitate Māori business development.

3.2 Kiwa Media

Kiwa Media provides digital media production; language dubbing, software development and TV and film production Kiwa Media are the innovators behind the QBook™ range of Apps. These interactive learning storybooks bring a whole new level of functionality to ebooks and other similar apps. With synchronised audio and text, animation, touch to spell and even the ability to colour in the pages of the book, QBooks have proven immensely popular with kids of all ages. Kiwa Media also create custom apps for a variety of clients and purposes.

3.3 Kajavala Forestry Limited (KFL)

Kajavala Forestry Limited (KFL) is a traditional family logging and log processing business with some very innovative systems and approaches that are of huge value to the industry. A desire to be not so heavily reliant on one customer plus share the knowledge with others in the industry, led the KFL team to find out how it might be possible to market their in-house skills and systems as a unique range of services to the logging industry.

3.4 Animation Research Limited

Animation Research Limited began in 1989 as a joint venture between Taylormade Productions and the Computer Science Division of the University of Otago. The joint venture set out to explore the commercial possibilities that might exist in harnessing a 3D ray tracing renderer[4]. Its first 3D production was a title sequence for a Television New Zealand series, “University Challenge”.

[4]Ray tracing is a technique used to generate an image. It does this by tracing a path of light through pixels in an image plane, and simulating the effects of this encounter with virtual objects.

3.5 Atihau Whanganui Incorporation

Atihau Whanganui Incorporation (AWHI) is a Māori Incorporation established in 1970. The Incorporation was established following an order from the Māori Land Court to take back (resume and manage) 101,000 acres of land vested in the Aotea Māori Land Council by Whanganui Māori in 1903. The core business activity of the Incorporation is pastoral farming. The Incorporation has seven sheep and beef farms, and one dairy farm, with a total land area of 33,000 hectares. It also has interests in forestry (3,000 hectares), the remaining 6,000 hectares is leased out to various lessees.

3.6 Tipu Ora

Tipu Ora Charitable Trust was established in 1991. The purpose of the Trust is to address the health and wellbeing needs of children, their whānau and their extended whānau and the outcome of this was the establishment of the first Māori child and whānau centred health service delivered by Māori, for Māori, utilising Māori methods of delivery and assessment. Tipu Ora is also a private training establishment that has been providing education, training and qualifications since 2002.

3.1 Poutama

Poutama is an independent charitable trust established in 1988 to provide business enabling services to Māori. Poutama strives to create an environment for successful business ventures and economic growth for Māori. Income generated from its investments enables Poutama to engage in activities and provide services that support and facilitate Māori business development and growth.

Poutama seeks to facilitate economic growth for Māori and to create an environment in which Māori entrepreneurs and businesses can flourish. Poutama has skilled professional business advisers who deliver advice, information and investment on and into business opportunities.

Broadband has made the office obsolete

Poutama is a lean machine with fat features. The Poutama Team are based within the regions, close to their clients, not at the office. Poutama Business Advisers cover specific geographical areas. Poutama operates off a base of mobility and technology. Its Advisors are highly mobile, and travel widely and regularly throughout the whole of Aotearoa - New Zealand. Broadband has enabled Poutama to be effective and efficient in servicing the needs of their clients and ensuring regular internal communication through communications technology such as Skype. Skype is a technology tool that cannot be effectively used without access to broadband and will be more efficient with higher resolution quality once Ultra-Fast Broadband is in place.

The CEO of Poutama, Richard Jones, says that "broadband is just part of doing business and in future Ultra-Fast Broadband will be a necessary part of doing business".

Poutama staff has been working remote for the last 15 years. The CEO, Richard Jones, says that *"I have seen significant gains from moving from dial-up to broadband and know that moving to Ultra-Fast Broadband will see considerable gains for my team and our clients".*

The speed of broadband depends on where staff are based and none of the staff currently have access to Ultra-Fast Broadband. The head office in Wellington is where Poutama's ICT systems are held. The organisation is moving towards a hybrid system that will see a partial move to cloud-based computing. Once this technology is tested and improved, then Poutama will move to a fully cloud-based system. Access to broadband from where staff are currently located is not an issue; however, access issues can arise when staff are travelling, for example the East Cape.

Broadband is enabling Māori businesses to grow .....and to grow faster

Poutama deals with clients across all sectors and some of these sectors are heavily reliant on broadband access. Richard acknowledges that it is very important that their clients have access to Ultra-Fast Broadband in the future to ensure that they use all the productive tools at their disposal to be more competitive and to grow. He says that Māori businesses are very diverse, as is their use of technology. Some of their clients make full use of email, social media and cell phone technology, while others confine themselves to just using email.

Sectors such as tourism have gained meaningfully from access to broadband. Under the brand name IndigenousNZ Poutama has developed a website to promote Māori tourism, food & beverage, arts & design and fashion (http://www.inz.Māori.nz.) This website has full e-commerce facilities that would not have been possible without access to broadband. This

is a very exciting site, with ph otos and videos that cannot be seen without broadband. However, this imagery will improve through the use of Ultra-Fast Broadband. Dealing with secure financial transactions is extremely frustrating for clients if the speed of their connection cannot handle the transactions.

Moving to a full on-line application system

Poutama has moved its client investment programme to a full on-line application system and does not accept paper applications from businesses. This process speeds up the evaluation process and all communication back to the client is done electronically either by email, Skype or social media. This ensures real-time communication with clients and decreases downtime due to paperwork not being completed or received.

Cost saving one of the biggest gains …..

Poutama has seen significant cost savings from broadband. Access to fast broadband enabled Poutama to run multiple projects at the same time. They use a mixture of cloud computing and servers to run the business and are constantly exploring better ways of using technology to make the business more productive. These include the use of *Dropbox for files* to ensure that the project team has access to relevant files at the same time. The organisation is currently moving to Microsoft 365 and MS Lync to help facilitate more real-time file sharing and communication.

Moving to Ultra-Fast Broadband will ensure even faster ways to do business, especially with communication. Having powerful video communication throughout the country and internationally will enable Poutama and their clients to deliver presentations and negotiate deals via the internet, thus saving time and money.

...just the way we do business

Staff are up-skilling all the time in using new technologies, as and when they become available, as Richard says *"this is the way we do business".* With staff working predominantly remotely it is important that they have fast access to the internet.

Next step in the evolution

Richard and his team have always been early adopters of new technology. However, he acknowledges that some technology has not turned out as expected, such as the use of social media like Twitter, Facebook, Pintarest, Instagram, Four Square and YouTube. These social media apps were adopted to promote Poutama's services; however, it takes substantial amounts of time and effort to optimise the returns from social media. Learning from this experience, Richard and his team believe it is good to share their success stories, as well as the not so successful stories, with other Māori organisations. This enables these organisations to learn and not make the same mistakes. In the future, Poutama will continue to explore the possibilities of new technology with their clients, thus ensuring that Māori businesses have the technology to succeed at their disposal.

3.2 Kiwa Media

Kiwa media provides digital media production, language dubbing, software development and TV and film production. In software development Kiwa media is focussing on content migration systems, bringing existing creative content to the mobile and touch screen, by utilising audio and text synchronization. They work on all Apple software technologies, including mobile (iPhone, iPod Touch & iPad) and Mac OS X systems. Kiwa media has its own production premises, post-production facilities and recording studios. Kiwa media has a full HD television production service, as well as a state-of-the-art digital post-production and audio-post facilities and a solid team of freelance crew who work across the productions, bringing their unique skills to the big screen. They are also the largest dubbing company in the South Pacific, localizing international content into indigenous Pacific languages like Te Reo Māori and Tahitian Maohi .

Dealing in a global marketplace

Rhonda Kite, CEO of Kiwa media, says that they are a small company dealing in a global marketplace. It is obvious for them that Ultra-Fast Broadband will be one of the next tools to service their consumer market faster and better. Their market demands quick delivery of services and they compete with international providers that do deliver faster services.

Need to ensure reliable access to uninterrupted broadband

Kiwa media does not have Ultra-Fast Broadband yet. The business is a high user of the internet. The upload of some of their apps[5] can take between three and four hours and are interrupted on a regular basis by lost broadband connections for both local and international clients. This is a serious problem for especially their international clients that demand faster and more reliable downloading of apps. The focus for Kiwa media is to ensure reliable access to uninterrupted broadband to guarantee safe downloading of their apps.

Launch of the iPad was the start of digital publishing and the digital future…..

The iPad was the start of the digital publishing industry. This industry deals with significant volumes of data, which needs high speed internet to be able to deliver and function effectively. Rhonda says that New Zealand companies must be able to do business out of their own country without feeling like the poor cousin when competing with other significant digital players such as the US. At present Kiwa media is hosting their information on an Australia server due to cost and reliability. They would like to see this situation change and be able to move to a New Zealand server in the future. This can only be achieved if Ultra-Fast Broadband is rolled out to a significant part of the country.

[5] Apps is an abbreviation for application. An app is a piece of software. It can run on the Internet, on your computer, or on your phone or other electronic device.

……..have to have our own stories on the web

Rhonda says that we have to create Māori content that can be shared across the various apps that people are using. These new technologies will enable companies to create Te Reo content that will be easily accessible to all young and old.

Government should provide Ultra-Fast Broadband as an enabler for business

If the government is really serious about economic development it should provide businesses with the tools to do business not only in New Zealand but also in the international marketplace. Ultra-Fast Broadband is definitely one of the tools that business will need to compete in the international marketplace in the future. Government should work closely with businessess to support them to have affordable access to Ultra-Fast Broadband.

Right skills and training needed to have Māori participate in the digital future

Rhonda indicated that she needs highly skilled people for the production and development of apps. Three years ago she participated in a cadetship programme that Te Puni Kōkiri sponsored. From this cadetship she had 20 Māori participate in the programme and four are still with her company.

Rhonda is also passionate in ensuring that digital technology is introduced into schools. She thinks that it is important that Māori kids have access to meaningful transmission systems to ensure access to knowledge. Supporting this will need to go hand in hand with upskilling teachers to teach in the digital environment. To be able to achieve this, schools will need access to faster internet through Ultra-Fast Broadband.

Possibilities are endless

Multilingual QBook apps are very popular. Rhonda visited Mexico and demonstrated their interactive Milly Molly books to the education sector. These QBooks are an interactive read-along digital colour picture book designed for young children. It is an eBook, iPhone and iPad app that combines a narrator's voice with original picture illustrations and touchable text that is synchronised to highlight and sound when words are touched. After the presentation 5 000 of these books were sold on that same day to Mexican Education Boards. Rhonda has also managed to provide five

The CEO of Kiwa media, Rhonda Kite says that tomorrow's technology does not fit into yesterday's business models. The digital arena is a collaborative industry where competitors have synergies and work together.

books in the first nation languages for the Alaska Association of School Board. There is significant potential as 232 indigenous languages are spoken in Canada.

Perception plays a crucial role in Kiwa media attracting international clients. They need to convince their clients that they can provide higher quality services than local providers. This service provision does also depend on having reliable and efficient broadband.

Cost and reliability the main considerations for moving to Ultra-Fast Broadband

Kiwa media will consider moving to Ultra-Fast Broadband if the benefits outweigh the costs of connecting to Ultra-Fast Broadband. Kiwa media is at present not convinced that Ultra-Fast Broadband will bring significant productivity gains. They are however prepared to look at the options when it becomes available.

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3.3 Kajavala Forestry Limited (KFL)

Kajavala Forestry Limited (KFL) is a traditional family logging and log processing business with some very innovative systems and approaches that are of huge value to the industry. A desire to be not so heavily reliant on one customer plus share the knowledge with others in the industry, led the KFL team to find out how it might be possible to market their in-house skills and systems as a unique range of services to the logging industry.

Experience and specialisation has enabled KFL to become New Zealand's central processing and log management professionals

KFL returns optimal value to forest owners using innovative central processing yard (CPY) systems. KFL integrate log-making quality with a full range of central processing yard services to offer complete log management solutions. The system is totally computerised and relies on a closed 20 hectares wi-fi access system to work effectively.

They use a real-time, web-based, production tracking system…….

The trees are cut down and the stems are transported to the KFL lumber yard where they handle about 8 percent of New Zealand's forest volume. KFL is responsible for tracking, managing and organising all inventory and delivery. As mentioned, they use a real-time, web-based, production tracking system, custom-built by KFL. The log orders for local and export markets are presented to the log graders in the form of an electronic *cutplan*. The log yard is a large Wi-Fi site and production from the log graders is recorded, to a production database. These are real-time, enabling plans to be modified as orders are completed.

Jacob Kajavala, managing director is modest about their achievements, stating "not bad for a couple of Māori boys from Tūhoe"

…….that has to be stripped down for the website to be accessed by forest owners

Live *cutplans* are communicated to log makers via handheld PCs that have access to the wireless network feeding back to the central computer. This information is then accessed by

forest owners via a website. The volume of information from the *cutplans* has to be stripped down for the website to be accessed by forest owners due to the limitation of broadband in handling the volume of information. If Ultra-Fast Broadband was available forest owners will be able to access more detailed information from the *cutplans* via the website enabling them to make more informed decisions.

Bottleneck in the supply chain due to slow connectivity

KFL distributes the logs up the supply chain through rail and shipping services to international destinations. The logistics for this supply chain is managed on-line. The connectivity is sometimes so slow that they cannot process the logs in time and staff have to work longer hours to get the logs shifted out of the yard, as Jacob says "the ships will not wait for you". KFL's business needs to be close to the forests and its products and has to have access to the best technology and tools to operate their business.

Technology is a significant part of the business…….

The benefits of Ultra-Fast Broadband will be significant for KFL and their clients. It will allow larger data parcels to be shared between the yard, forest owners and clients. Ensuring the delivery of more detailed information faster (in real-time) to forestry owners, and enabling them to increase the profitability of their log processing businesses.

KFL is a rural business with an international reach that needs access to the best and fastest technology to ensure best prices for their clients. Therefore faster broadband will enable KFL to process the logs up the value chain quicker and on time for transportation out of the yard and on to the ships.

……and Ultra-Fast Broadband will enhance business opportunities in Kawerau

Jacob stresses the importance of having Ultra-Fast Broadband in small towns such as Kawerau, saying *"this will bring options for larger industries to settle in smaller towns, creating employment opportunities for local people. It will also open the doors for local businesses to play on the international market"*.

A great example is SwICThkites.com, an on-line business that Jacob and his brother Daniel started. They started the business to reduce the cost of the gear for kite surfing, as the sport became less accessible with gear being so expensive. They use online stores to sell the gear directly – as Jacob says *"we make it and sell it directly to the customer, no middle man"*. They started the business about twelve months ago and has already cornered between three and four percent of the world market.

Jacob says he understands that New Zealand needs to go global. He cannot see why Māori businesses cannot start globally from small towns like Kawerau. He thinks that Māori businesses will be able to enhance business opportunities though Ultra-Fast Broadband, including the creation of employment opportunities for Māori that work for them.

Continual up-skilling and training are fundamental to KFL business.

Providing opportunity for career advancement has given KFL some of the lowest staff turnover in New Zealand forestry. They focus on continuous up-skilling of their staff and have specialists in central processing, integrated logistics, and log-value recovery. They are confident that their evolving skills give strength and reliability to their customer service.

Jacob says that 80 percent of his staff starts with no experience at all. He likes to provide opportunities for local people to become part of the business and to grow their skills.

3.4 Animation Research Limited (ARL)

Animation Research Limited began in 1989 as a joint venture between Taylormade Productions, founded in 1989 by Ian Taylor, a former Executive Producer and children's television presenter at TVNZ, and the Computer Science Division of the University of Otago. The joint venture set out to explore the commercial possibilities that might exist in harnessing a 3D ray tracing renderer which had been developed by Dr Geoff Wyvill, Head of the Division's graphics department. Its first 3D production was a title sequence for a Television New Zealand series, "University Challenge." This production became the first of many for TVNZ.

In 1991 Taylormade Productions acquired all the University's shares and restructured ARL into an entity its own right. At about this time ARL produced its first television commercial. A full 3D animated TVC for United Airlines. This commercial won awards in New Zealand and internationally. It was also at this time that ARL, working with Television New Zealand, developed "Winged Keel" - the world's first live 3D animated graphics for sports coverage, which was the America's Cup Challenge in San Diego.

Ian Taylor the CEO of ARL describes his business as turning digital data into pictures that people can understand. Having access to faster broadband is a critical part of his business and he says "it should not be a debate, I honestly do not understand why people want to explore the benefits of UFB - it should not be up for discussion, we need faster broadband"

There have been many milestones for ARL in the intervening years. The award winning Air New Zealand commercial, the internationally acclaimed "Skiing Penguin", the world's first animated coverage of a Round the World Yacht Race (The Whitbread), the world's first live to air GPS ball positioning for golf (Golftrac), together with computer generated flyovers

Staying one step ahead

ARL has actively adopted new technology to stay one step ahead of their competition. They have delivered some extraordinary products such as the Māori mythology animation for the Rugby World Cup in 2011.

Below is an image from the myth of Maui and his brothers fishing up the North Island of New Zealand, part of ARL's 2011 Māori Mythology animation (originally in stereoscopic 3D) that screened daily in the Waka Māori pavilion during the 2011 Rugby World Cup.

Can do more work, quicker, if broadband was faster

ARL does not have access to Ultra-Fast Broadband yet. According to Ian, their current broadband speed is not sufficient. If they had access to faster broadband they could do more work faster, and deliver more especially to their international clients. They have a 350 GB monthly plan and tend to exceed this on a regular basis, costing more money to have access to more gigabytes. This company is a high-user of the internet and their business success depends on access to fast broadband.

Whatever the business does it will do it from Dunedin.....

In 1989 Ian decided that he was never leaving Dunedin, with this decision came the notion that whatever the business does it will have to do it from Dunedin. Due to this choice the business was early user of the internet to ensure access to clients and new markets. They have always built systems on the back of tools that allowed them to meet that goal of running the business from Dunedin.

…..and they created an international business at the bottom of the world

ARL now has a significant international client base, which was made possible by access to broadband. However, growing and maintain this client base will be dependent on ensuring that the broadband speed is increased to meet the needs of clients. This will mean that time not distance will create a comparative advantage for companies like ARL.

Ian can clearly remember in the very early days making an advertisement for an agency in London. Their competitors were not using internet as they thought that being based in London they do not need this new technology. This was a real mistake as ARL could access information from their client and provide information to their client faster than their competitors could travel across London to provide the information.

ARL also provided all the special effects for a BBC six part series on "Inventions that changed the world". Staff worked with directors and producers in London without ever meeting the people face to face, just by providing information via e-mail and websites.

Work where you want……not where the boss lives

ARL staff are based in Wellington, the United States, and London, and travel all over Europe. Due to personal circumstances, staff have had to change their location, but they have not had to change their jobs. Ian can retain his talented staff that are relocating due to the ease of doing business over the internet. Access to broadband and technology also means that Ian is able to attract the brightest and best from all over the world to work for ARL.

Lack of understanding of the importance of access to broadband

ARL has benefited from change and also suffered due to a lack of change. According to Ian the failure of past governments to really understand the value and importance of broadband has been to the disadvantage of his business. ARL has to compete with international organisations that have access to faster broadband, creating disadvantages for the business when working on projects that have high levels of time sensitivity.

Ian says that "We are behind the 8 ball; we are just catching up with Ultra-Fast Broadband. Looking further out into the future we have to ensure that Ultra-Fast Broadband will be cheaper and faster than what arrives here from our competitors".

Yellow brick road.....what every civilised nation needs

Ian believes that Ultra-Fast Broadband is part of the infrastructure that every civilised nation needs, like a new version of a road, and as part of being vital infrastructure it should be affordable.

The future possibilities are significant with access to Ultra-Fast Broadband

ARL likes to push the envelope and is confident that they could achieve much more if they have Ultra-Fast Broadband. Ian tells the story that he came across new Swedish technology that he thought could be applied to an upcoming rugby test scheduled in Auckland. He contacted the company and within a couple of days the Swedish company has transferred the software to ARL. There was no time to ship a computer over from Switzerland and ARL built a new computer to run the software, with assistance from the Swedish through Skype. ARL staff could literally show the technician, through Skype, in Switzerland how the computer was assembled and they could visually assist the ARL team to assemble the hardware correctly. This application of Skype enabled them to complete the software, and deliver the computer to be used at the game that same week in Auckland.

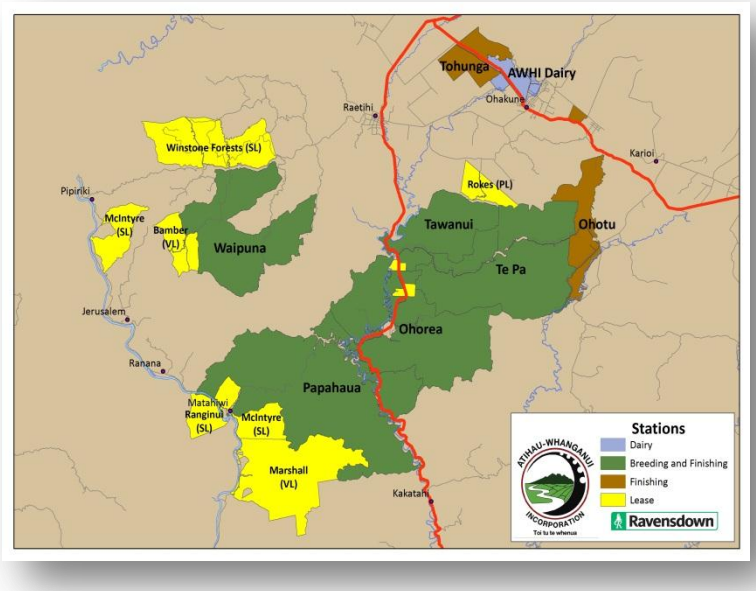
The big challenge is to make Ultra-Fast Broadband affordable for all New Zealanders including Māori businesses

According to Ian there is no downside to having Ultra-Fast Broadband, but the big challenge will be to make it affordable for all New Zealanders including Māori businesses. Ian says *"our country is isolated and access to the rest of the world will depend on the speed and cost of Ultra-Fast Broadband"*. ARL has indicated that the business will only connect to Ultra-Fast Broadband if it is affordable and the benefits outweigh the costs.

3.5 Atihau Whanganui Incorporation

"We are frustrated like hell about our internet connectivity" this is the very worrying words from the CEO, Chris Scanlon.

Atihau Whanganui Incorporation (AWHI) is a Māori Incorporation established in 1970. The Incorporation was established following an order of the Māori Land Court to take back (resume and manage) 101,000 acres of land vested to the Aotea Māori Land Council by Whanganui Māori in 1903. The core business activity of the Incorporation is pastoral farming. This involves seven sheep and beef farms and one dairy farm on 33,000 hectares. The Incorporation also has interests in forestry (3,000 hectares), and the remaining 6,000 hectares of their land is leased.



We need reliable broadband…….period

At present AWHI receives broadband via satellite. However, the satellite connection is not reliable and is extremely unpredictable during bad weather conditions. The AWHI server is located at their head office in Whanganui. The eight stations have varying degrees of access to broadband. The station manager at Te Pā has access to broadband via a cellphone connection but only in a small part of his house and not on the rest of the farm. Ohorea Station is in a valley that makes access to broadband nearly impossible. Waipuna Station is especially sensitive to the weather. The station managers at Ohotu and Tohunga have access to broadband due to their close proximity to Ohakune.

Another significant constraint is the lack of cell phone coverage on the eight stations. This contributes to the lack of access to tools that can be used in parallel with broadband to increase the productivity of the farming operations.

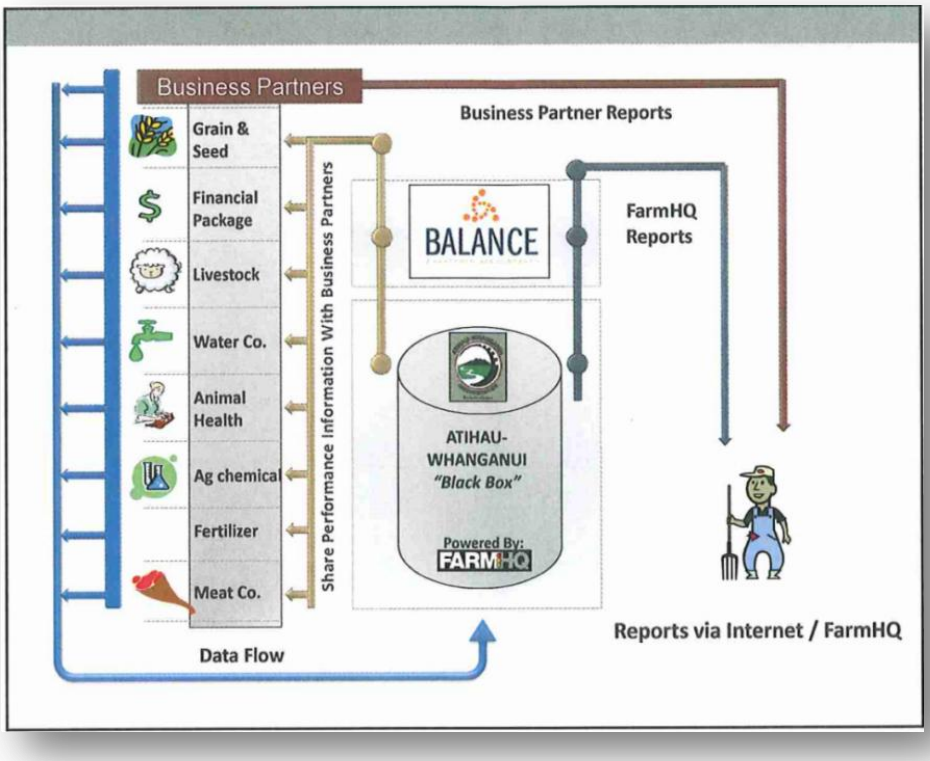
Farming is the heart of the New Zealand economy and needs reliable Ultra-Fast Broadband to stay competitive

A significant farming operation like AWHI needs access to the latest communications tools and technology to stay ahead of the game. This will enable them to deliver the best products, at the right time, at the best price, to the market. At present AWHI cannot use these tools effectively due to a lack of reliable broadband.

Rural areas are severely disadvantaged by the lack of access to broadband

The AWHI office in Ohakune has just moved from ADSL (Asymmetric Digital Subscriber Line, a data communications technology that enables faster data transmission) to ADSL2 as they share the office with two other businesses enabling them to move to a faster system. The new ADSL2 has a 16 megabyte download speed, a couple of megabytes upload. It is double the output of only ADSL. However, the office in Ohakune still prints out weather maps and hand delivers them to the stations, as this is quicker than emailing them due to the extremely slow download speeds at the individual stations.

Farm HQ is a progressive software package that is vital to sharing on farm productive information……



AWHI has purchased the Farm HQ software but are unable to utilise it to its full capacity due to the lack of reliable and fast broadband. This software has significant potential, especially in the capture of real-time on-farm data. This data can then be converted into reports that are used collectively to make informed decisions about land and livestock performance and livestock movements across the eight stations. Above is a schematic flow diagram of the ideal situation that AWHI has designed. This system has been put in place but is not working effectively due to the lack of reliable and fast broadband.

…..however, station managers are not using the technology tools due to slow broadband connection

The eight station managers are reluctant to use the farming software due to the speed of the entire process. They find uploading and downloading from the system extremely slow and unreliable, making it a very frustrating process. Therefore, while AWHI has instituted a "one-farm" approach to farming, this has been significantly hampered by the lack of real-time sharing of information between the station managers. This has further created silos in operational procedures and decision-making. The managers have also not been able to use visual tools such as Skype to enhance communication.

Positive flow-on effect for Whānau

AWHI would like to first ensure that all their station managers and the Head Office have access to reliable broadband before they work with Ultra-Fast Broadband. This will then enable the families of all eight stations to have access to the internet. AWHI is prepared to invest in broadband infrastructure as long as it solves the problem. They will pay to have access to decent broadband and wants to know what it will take to get there.

Future gains from Ultra-Fast Broadband

Chris foresees various significant gains from reliable Ultra-Fast Broadband. The first will be the ability to communicate in real-time with all the station managers, and ensure AWHI is run as a unified business with the best information available.

The second significant gain will be the CEO having access to information across all eight stations at the same time. This will enable him to make informed decisions and feedback information to station managers if, and when required, without delay.

Chris says that. "People in town have good broadband connections, and I do not think that it has led to huge productivity gains, but in our business it will have huge productivity gains".

3.6 Tipu Ora

Tipu Ora has been described as the most successful Māori child health promotion programme operating in New Zealand (Ropiha 1991, Te Puni Kkiri 1993, Ratima 1995).

The Tipu Ora vision is to provide excellence and leadership in striving for greater achievements in health, education and social services. In 1989, amidst worsening Māori health statistics, the Women's Health League decided to revive a successful formula and establish a health service for Māori by Māori. Inez Kingi, the Women's Health League President, and Papakura General Practitioner Dr. Jacqueline Alan, co-founded and designed the Tipu Ora Māori Child and Mother Service, and in 1990 secured funding for a pilot programme.

The purpose of the Service is to promote and protect the health and wellbeing of tamariki Māori so that in the future they would be able to pursue a range of socio-economic and cultural opportunities to reach their full potential. The programme would use grandmothers called Kaitiaki, meaning guardian or protector, from the local community. These women would have various backgrounds in health, education, and welfare and marae activity, and deliver health education and support the tamariki until school age. Tipu Ora decided to invest in education, prevention and intervention rather than investing in remedy, reform and rehabilitation.

Key to the success of Tipu Ora has been the stewardship provided by Māori leaders

As a result of the success of the initial pilot programme, Tipu Ora Charitable Trust was established in 1991.

The express purpose of the Trust is to address the health and wellbeing of children, their Whānau and their extended Whānau. In designing an appropriate programme, Tipu Ora recognised the challenge to develop an appropriate model that was wellness rather than sickness based, and delivered with culturally appropriate methods. The outcome of this was the establishment of the first Māori child and Whānau centered health service delivered by Māori, for Māori, using Māori methods of delivery and assessment.

Their services include family start, parents as first teachers, health promotion, midwifery services and a women's health league. Tipu Ora is also a Private Training Establishment registered with NZQA and has been providing education, training and qualifications since 2002. They deliver NZQA accredited certificates and diplomas in Hauora Māori.

Moving to Ultra-Fast Broadband will depend on the cost

Tipu Ora is in the process of finalising various significant capital projects including the plans for their new building. Once the significant capital projects are completed, by September, they will consider connecting to broadband in parallel with the design of their new website. The critical factor in this decision will be the cost to connecting to Ultra-Fast Broadband. The benefits of access to Ultra-Fast Broadband need to significantly outweigh the costs of connecting to this service.

Rely on robust information technology and communications

As a provider of a wide range of services mainly to Māori they rely heavily on having very robust information technology and communication systems to support their activities. Many of their client data systems are web-based, and frontline staff requires efficient and reliable access to these facilities. Providers are required to handle large amounts of information and this is often in the form of monitoring and providing reports to external stakeholders and funders. Their current broadband connection is sufficient *but as Raewyn Bourne, Executive Manager says "we do not know what we are missing out on with not having access to Ultra-Fast Broadband".* She is convinced that with a better understanding of the capabilities of Ultra-Fast Broadband they will be able to increase their ability to provide good information and have access to the best information with a very fast click of the mouse.

Increasing need to share information directly with clients

Tipu Ora has also established a community oral health service. They have installed digital technology for x-ray imaging in all their clinics and have a mobile dental unit. There is an increasing need to share information from these health services and clinics directly with the client as well as with other health professionals. Ultra-Fast Broadband will enhance their ability to reach this level of Best Practice.

With access to Ultra-Fast Broadband Tipu Ora will be able to obtain speedy clinical advice from clinicians in major centres in New Zealand or overseas.

The dentist working in a mobile dental unit based at a Marae will have access to the highest level of external support and immediate access to expertise in New Zealand and overseas through the facility of Ultra-Fast Broadband. At the moment expert advice takes a long time to be gathered and fed back to the clients.

Raewyn acknowledges that Tipu Ora need to ensure they have the capability and capacity of ICT systems to support not only client information but also the back-office systems enabling support structures and better access to data.

Raewyn says "having access to Ultra-Fast Broadband will be a credibility issues for businesses. It will show that your business has foresight and are prepared for the future".

Significant part of client base are young and technology savvy

Although Tipu Ora targets low income people, their client base is increasingly using web based technology to access information and to communicate with health providers. Also, a significant part of their client base is young and demands on-line services with access to quick information and advice.

Tipu Ora is also a Private Training Establishment and have seen a greater demand from students to interact via the web. With access to Ultra-Fast Broadband Tipu Ora will be in a better position to service the needs of their students through faster reaction times, greater volumes of information and enhanced visual communications.

Lack of a universal integrated health information system

Tipu Ora has four different patient management systems that do not talk to each other. On top of these systems, Tipu Ora also interface with three significant national databases that also do not talk to each other. As Tipu Ora moves into the realisation of Whānau Ora within

the rohe of Te Arawa, there will be an increasing need for information systems that talk to each other and to be accessed at one point. This development needs a solid, reliable and fast IT infrastructure to support the different service providers in accessing and sharing the data.

Providers of services, such as Tipu Ora, need an integrated client data base and Ultra-Fast Broadband will enable such a database to be effectively used by staff and clients. This will lead to higher customer satisfaction and happier staff.

Raewyn stresses that "Increasingly our world is a global one. While our services are very much local community based, we seek and share information at a national and global level".