

Te koke ki tētahi Rautaki Matihiko mō Aotearoa Towards a Digital Strategy for Aotearoa

*Te whakaāhei i te puāwaitanga me te taurikura o te katoa
o Aotearoa i roto i te ao matihiko*

Enabling all of Aotearoa New Zealand to flourish and
prosper in a digital world

PEPA MATAPAKI | DISCUSSION DOCUMENT



Te Kāwanatanga o Aotearoa
New Zealand Government

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Kupu whakataki a te Minita Ministerial foreword

E ngā mana, e nga reo, e nga karangatanga maha huri noa i te motu, tēnā koutou, tēnā koutou, tēnā koutou katoa.

To distinguished leaders, to the people and many connections among us, greetings, greetings, greetings.

As a small trading nation a long way from markets, our economic prosperity has been shaped, in part, by the tyranny of distance. New Zealand's future prosperity lies in sustainable high value jobs producing goods and services with a lower carbon footprint. Technology connects people and markets, is the pathway to tomorrow's jobs, and helps combat climate change. Our brighter future involves digital.

I believe we have huge opportunities in front of us. From championing the Christchurch Call and the elimination of violent and extremist content online, to our global perceptions of trust and ease of doing business, New Zealand is known around the world as a country that does what it says it is going to do. Through the Digital Strategy, we have the potential to be a world-leading digital nation built on trust and known for the ethical deployment of new technologies.

The COVID-19 lockdowns have demonstrated the potential for New Zealanders to adopt digital solutions to facilitate learning, working and doing business in the face of a global pandemic. We are on a path to digital transformation, but to attain our share of the exponential growth potential in the digital sector, we must act now.

The Digital Strategy for Aotearoa will be our blueprint for a higher productivity, lower emissions future where all New Zealanders have the opportunity to flourish in a digital world. This discussion document seeks your views on the ambition, direction and approach to our digital future.

This document, and the workshops we'll be running over the coming weeks, are the start of a conversation on how we can reach our full potential in the digital age. I look forward to hearing your views as we embark on a pathway towards a Digital Strategy for Aotearoa.

Ko te pae tawhiti, whāia kia tata, ko te pae tata, whakamaua kia tina
Seek out distant horizons and cherish those you attain



Hon Dr David Clark
Minister for the Digital Economy and Communications

Te waihanga i te Rautaki Matihiko mō Aotearoa

Creating a Digital Strategy for Aotearoa

How we keep pace with changes in digital technologies, and how they are used in our economy and across our communities, will have a strong impact on Aotearoa New Zealand's future prosperity. The potential benefits of using digital ways of doing things are large. They will help improve lives, expand consumer and career choices, and contribute to solving wider issues, like climate change.

A Digital Strategy for Aotearoa (the Strategy) will need to respond to the social, economic, education and cultural opportunities from digital technology, along with the risks that these technologies can bring. It will set out our key goals and help us to identify core priorities and activities for the short to medium term (that is, in the next two to five years), along with longer term results (out to 2031 and beyond).

We want to know what New Zealanders think the vision, goals and results should look like, and what the priorities for action should be.

We've built our thinking around three key themes that could form the structure for the Digital Strategy: Mahi Tika – Trust, Mahi Tahī – Inclusion, and Mahi Ake – Growth (see Figure 1). Each of the themes could be supported by an aspirational goal. We propose to focus on each theme to achieve our vision of

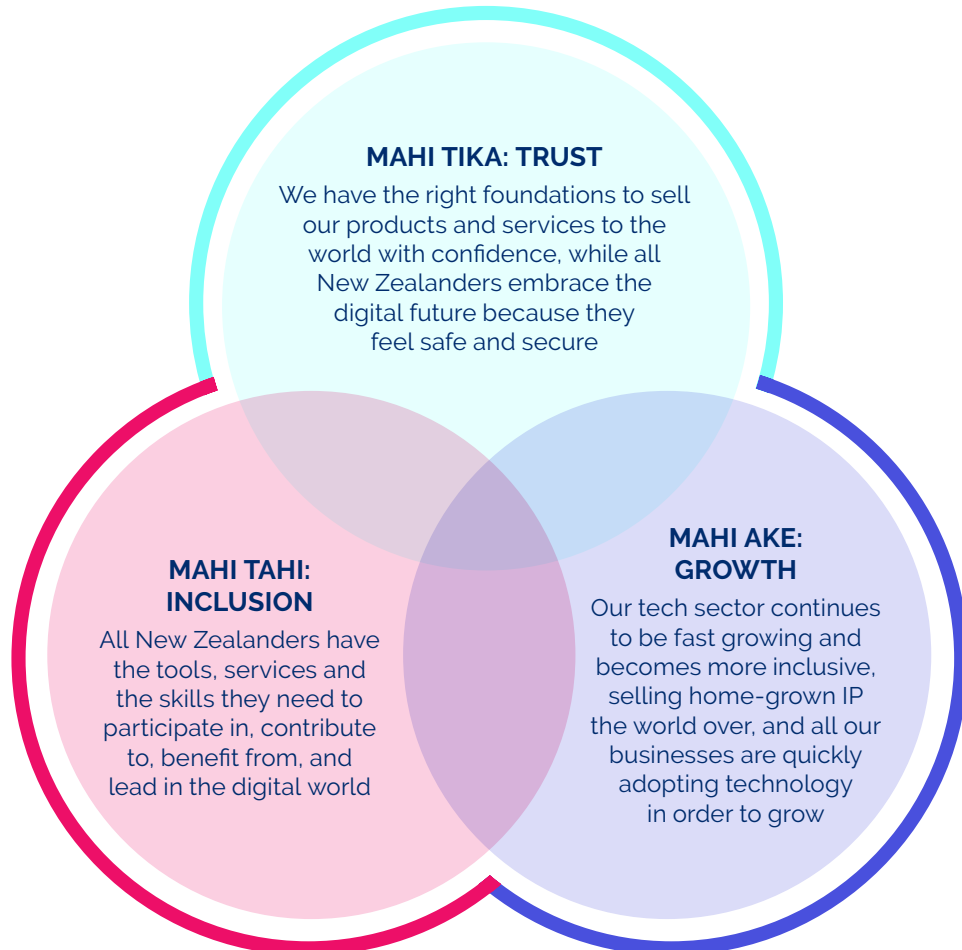
"Enabling all of Aotearoa New Zealand to flourish and prosper in a digital world".

We want Aotearoa New Zealand to be an early adopter and a world leader in the digital economy. Our nation's identity is unique and so are the stories we tell. The world benefits from our products, approach and innovation and as a country we know we have so much more to offer.

Aotearoa New Zealand expects fairness and as we embrace the digital frontier, we need the right foundations to take all Kiwis on the journey.

This Digital Strategy will set the tone for what is a resilient, sustainable, low emissions, and future-proofed Aotearoa New Zealand.



FIGURE 1: Proposed vision and goals**Enabling all of Aotearoa New Zealand to flourish and prosper in a digital world**

What would reaching this vision mean for us as New Zealanders? Some thoughts on this include:

- New Zealanders have better access to, and use, digital services when and where they need them;
- Small and medium sized enterprises (or SMEs) are increasingly ready and able to grasp digital innovation opportunities and create growth and jobs;
- New Zealanders are safe, secure and confident in a digitally enabled world, for example, citizens and businesses trust that their private information is safe;
- We would see ourselves as leading the world in the creation and adoption of responsible digital practices.

Tell us what you think

- We are keen to understand what you think is important for Aotearoa New Zealand's digital future.
- What are the big issues and opportunities right now?
- What are the short-term and longer-term things we as a country want to achieve?
- Who needs to be involved?
- What roles should government, businesses, Māori and communities have in making sure that New Zealanders can create a prosperous digital future?
- How can we best work together to solve challenges and realise the full potential?
- Are there major themes, ideas, priorities or initiatives that are missing from our thinking?

We have included some questions throughout this document to stimulate your thinking. Please do not limit your comments to answering these questions. We welcome your comments on Aotearoa's digital future, including areas we may not have covered in this document.

You can share your ideas and have your say on Aotearoa New Zealand's digital future by:

- visiting our web portal and joining the online discussion at: www.digital.govt.nz/aotearoa
- attending hui and workshops in October and November
- sending us your ideas via email: DigitalAotearoa@dia.govt.nz

Your feedback will go to a joint agency team and will be used to help inform the development of a Digital Strategy for Aotearoa over the months ahead.¹



¹ The joint agency team comprises Ministry of Business, Innovation and Employment, Department of Internal Affairs, Department of Prime Minister and Cabinet and Stats NZ

Horopaki – te take e hira ai tēnei ki Aotearoa

Context – Why this matters for Aotearoa New Zealand

The opportunities – building our trust and inclusion foundations

Continued technological innovation will create significant opportunities for Aotearoa New Zealand to foster a productive, sustainable, and inclusive economy.

Technology and digital processes can help us to overcome challenges that affect every New Zealander. Digital tools and services can enable us to learn new skills, transact with ease, and to receive health and wellbeing support at a time that suits us and without the need to travel from our homes.

In order to be comfortable and confident in using digital tools and services, New Zealanders must have trust in how they work, and how their data and information is stored and shared. Creating and maintaining a trusted digital environment is a foundational step towards realising our vision of enabling all of Aotearoa New Zealand to flourish and prosper in a digital world.

We also have to ensure that our people, wherever they live, are able to connect and use digital tools – they have the motivation, access, skills and trust to operate online in a way that works for them. A Digital Strategy for Aotearoa will provide a platform to ensure that all New Zealanders are digitally included.

The benefits are spread across the economy

Our low productivity, compared with other developed countries, has long been attributed to our small domestic market and geographical distance from larger markets overseas. Digital trade now allows New Zealand-based businesses to export goods and services instantly and provides access to a global market of potentially billions of customers. Many Aotearoa New Zealand companies have had strong recent growth drawing from this digital opportunity.

Our tech sector's growth is outstripping growth in the wider economy

It is estimated that over the past five years, our tech sector has grown 30% faster than the economy overall.² It is a sector that is low in emissions compared to many other sectors, and high in exports, bringing new revenue into Aotearoa New Zealand from overseas sales. Jobs in the tech sector are less vulnerable to external shocks and are less reliant on natural resources. They also tend to be higher paid than the average.³ Whether they work in the tech sector or the wider workforce, New Zealanders who have digital skills will be less susceptible to future of work or automation risks.

² The economy (including price increases) expanded on average by 5.8% annually from 2015-2020, while estimated value added for the tech sector (including price increases) increased on average by 7.69% annually; or 30% faster. This is based on Annual Enterprise Survey estimated value added for the high-tech & mid-tech manufacturing and software sectors. These figures are not official statistics.

³ The median annual income from wages and salaries across all jobs in New Zealand was \$52,832 in 2019, while the national median base salary for ICT employees was \$92,250 [Source Labour market statistics (income): June 2019 quarter, Statistics New Zealand, August 2019; Tech Digital Remuneration Report, Absolute IT, July 2020]

Across the economy, adoption of digital technologies will increase productivity and in many cases mitigate against environmental impacts. For example, for primary industries, digital technology offers the potential to grow value, improve environmental sustainability and assist with labour market challenges (e.g. by using robotic technology). Other types of businesses, from hairdressers to mechanics, are using technology to connect with their customers and provide new and innovative types of services and products.

The challenges

The use of digital technologies can also address inequities and further connect us. However, if we do not harness them appropriately, or are unprepared, we risk allowing some people to miss out on the advantages, with significant negative consequences for them. We also risk creating space for their mis-use (that is, if we don't put in place the necessary checks and balances to ensure that digital technologies are used in ways that protect - not compromise - people's privacy).

Making sure all New Zealanders are included

Many New Zealanders are using technology to connect and build cohesive communities, and for lifelong learning and education, flexible working, and to access consumer goods and services. However, some people are not currently able to access these opportunities for a variety of reasons. Aotearoa New Zealand is well placed for fixed service broadband connectivity and has a dynamic internet service market with a range of technology solutions – from fibre, fixed wireless and satellite. However, connectivity infrastructure in some remote communities can still be a barrier preventing some people from being digitally included. Furthermore, some people may not have the access to digital devices or might not have the motivation or skills they need to participate in, contribute to, and benefit from the digital world.

Upskilling New Zealanders and businesses

Technological change and innovation will transform many industries, with long-term gains in efficiency and productivity. But many of these innovations may involve the automation of certain roles or even the destruction of older business models. These changes could disproportionately impact lower-skilled workers. With appropriate planning, we can help prevent negative outcomes by supporting workers to upskill and transition into new, higher-value jobs with better pay and prospects.

Some of our smaller businesses in particular are not yet reaping the benefits of the digital opportunities available to them. As digital technology becomes more and more embedded in our economy, businesses must be supported to evolve with it and adapt their business models accordingly.

Further, our fast-growing tech sector needs a strong pipeline of adequately educated and trained people to sustain its growth. A lack of talent, particularly at the senior level, is a commonly raised barrier for business expansion. This is constraining our ability to foster a world-leading tech sector selling quality products and services to the world.

Trust requires partnership between government, business and civil society

Digital technologies increasingly play a role in the day-to-day lives of New Zealanders. Government and industry have an important role to play in making sure that digital services are trustworthy. They must make sure that people understand how these technologies work and how they can improve people's lives, if used responsibly. The sophistication and frequency of cybersecurity incidents across the world is increasing, for example, ransomware attacks. The government is working hard to foster a safer and more secure digital landscape and has a leadership role to play in cyber security – but not on its own. Partnerships with the private sector, non-government organisations and the international community are needed.

How will we know we are successful?

Our success in progressing a Digital Strategy for Aotearoa and realising our shared vision will need to be measured across a broad set of indicators. More detail is included near the end of this document and feedback and ideas are very welcome. Initial success measures include that:

- The ICT sector doubles its economic contribution to GDP by 2030
- All significant government services are available digitally
- New Zealanders increasingly feel safe online
- More secondary school students are taking technology standards
- The numbers of tech-related graduates increases
- Our small businesses are more digitally capable (as measured by the SME Digital Index).

Our Digital Strategy will be an evolving document that will need to be updated over time and adapted as needed. This will include the adoption of new measures as they become available.

QUESTIONS:

- Q:** What do you think of the proposed vision, goals and measures?
- Q:** How could these be improved?

Opportunities for Māori

A Digital Strategy for Aotearoa will need to reflect Te Ao Māori and embody Te Tiriti o Waitangi – the Treaty of Waitangi. This includes making sure tangata whenua contribute to decisions about how we create the Strategy and the actions we take as a result over the short, medium and longer term.

Government has started to engage with Māori. Feedback from these conversations, and others still to occur, will influence our approach for the Digital Strategy – we are committed to continuing this kōrero and to engaging more widely with Māori.

The Strategy will need to reflect Māori values and aspirations from a social, economic, and Te Ao Māori perspective. Māori, whether it be iwi, hapū or individual entrepreneurs, are already leveraging the opportunities presented by digital technology, including as founders of start-up businesses, employees of tech companies, or owners of SMEs. The Strategy will provide a basis for fuller and ongoing engagement with Māori.

QUESTIONS:

- Q:** How might we best engage and partner with Māori on the Digital Strategy for Aotearoa as it evolves over time?
- Q:** For example, should we develop a separate strategy for Māori interests in the digital world?

Where we are now

To achieve our vision for a digital Aotearoa, it is important to understand where we are now in our journey towards being an inclusive and trusted world-class digital nation.

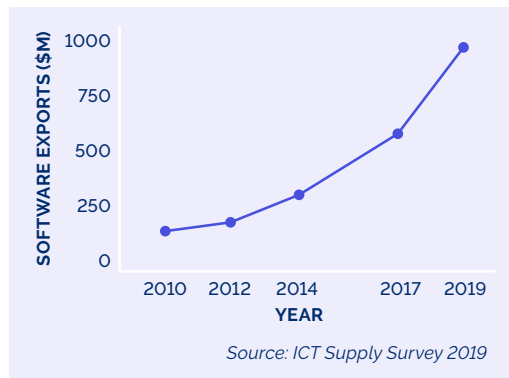
MAHI AKE

\$11.5bn The ICT sector contributed \$11.5bn to GDP in 2019

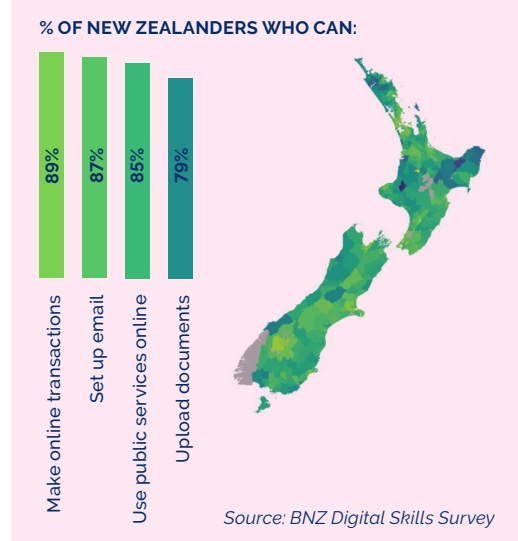
61,000 Over 60,000 people are employed in ICT

\$924m Software development firms spent \$924m on R&D in 2020 – over a third of all business R&D spend

\$976m Aotearoa New Zealand firms exported \$976m of software in 2019:



MAHI TAHI



84% In 2020, 84% of New Zealanders could access fibre connections

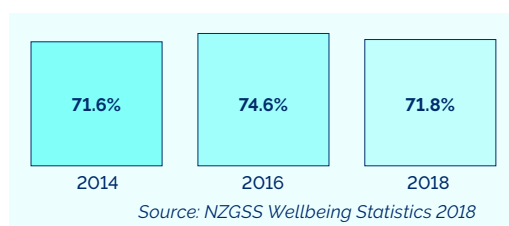
95% 95% of us accessed the internet through PC or mobile. However, as of 2018, some areas still had low rates of basic internet access.

80% 80% of New Zealanders have an essential range of digital skills

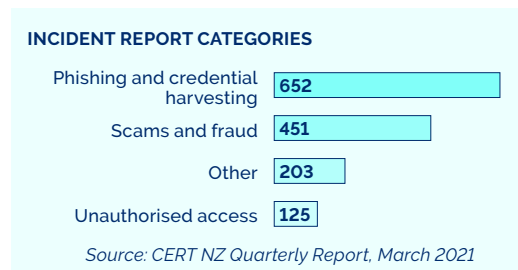
MAHI TIKA

90% 90% of New Zealanders report confidence with digital devices

71.8% But only 71.8% of us felt safe making online transactions in 2018:



1,431 In the first quarter of 2021, CERT received 1,431 cyber security incident reports, which cost victims a total of \$3.0m



Tō mātou wawata, mahere hoki ki te hanga i te Aotearoa matihiko ka puāwai, ka taurikura hoki

Our vision and plan to build a flourishing and prosperous digital Aotearoa

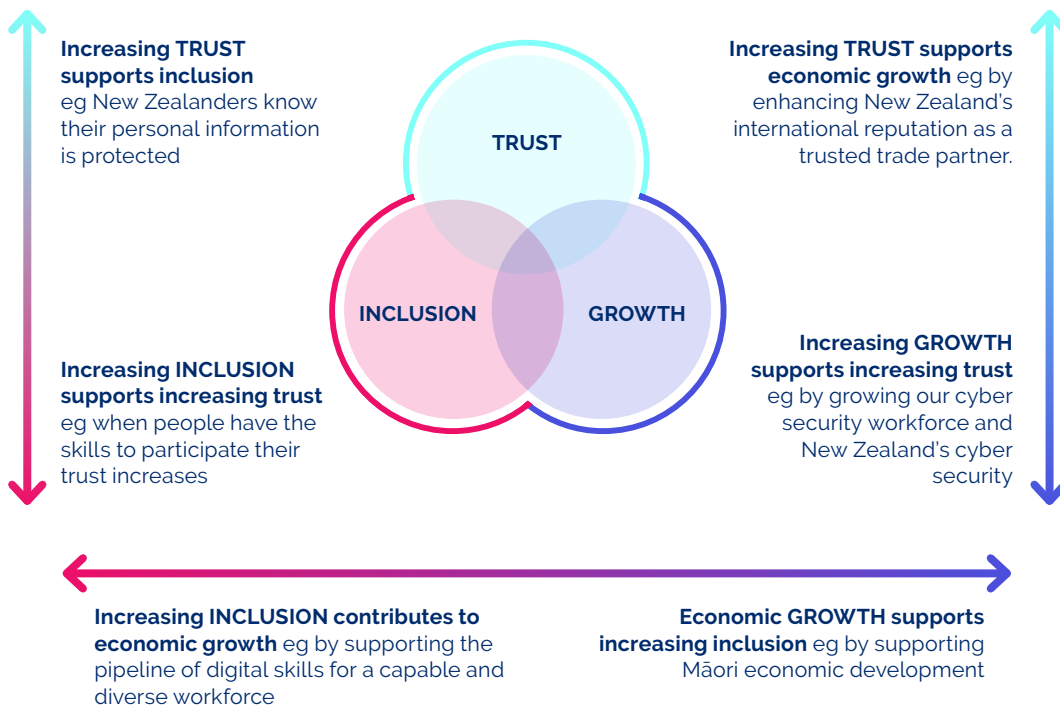
Our proposed vision is to enable all of Aotearoa New Zealand to flourish and prosper in a digital world.

We have framed the thinking on how we can achieve this vision into three interrelated theme areas. Mahi Tika – Trust, Mahi Tahī – Inclusion, and Mahi Ake – Growth. Each of the themes is supported by a proposed aspirational goal. This section outlines:

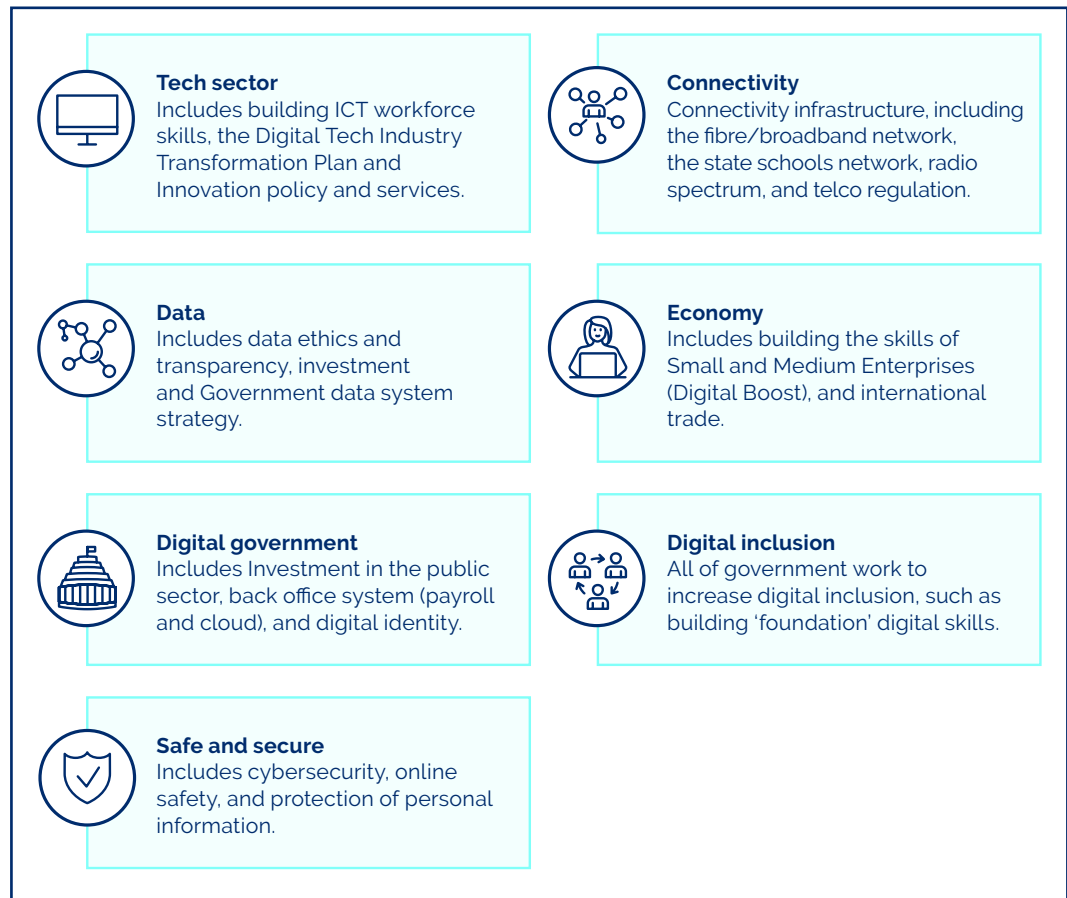
- What we want to achieve in each of these areas
- The work across government, communities and industry that is already underway
- The opportunities for where we think further progress can be made.

The trust, inclusion, and growth themes are part of a connected system

This diagram provides examples of the ways that Inclusion, Growth, and Trust interrelate.



Components that underpin our digital environment



Mahi Tika – Trust: Building the right foundations so that Aotearoa New Zealand can lead the world

GOAL: We have the right foundations to sell our products and services to the world with confidence, while all New Zealanders embrace the digital future because they feel safe and secure.

What we want

New Zealanders and kiwi businesses need to trust and be confident in how digital technologies are created, used, and governed.

Trust and confidence in the way that data and digital technology is being used requires:

- assurance that the services and the technologies consumers use are adequately protected, and New Zealanders' personal information is utilised in ways that they expect and in line with the Privacy Act 2020; and
- the responsible development of artificial intelligence (AI) to be fair, ethical and inclusive; reliable and safe; and transparent and accountable.

Reliable infrastructure and digital skills

Reliable and resilient infrastructure underpins the use of all digital technologies. Examples include connectivity infrastructure, and the infrastructure that supports secure digital identity information.

A world class digital nation cannot exist without trustworthy institutions and infrastructure. Maintaining a dependable and well-governed Internet is critical to connecting Aotearoa New Zealand to the world. This requires government, business, and civil society to work together.

Information and skills are also critical – people using technology need to understand what they can and cannot trust in the digital world and how to keep themselves safe and secure online.

Managing diverse security threats

The sophistication and frequency of cybersecurity incidents across the world is increasing. There's no simple way to articulate the cyber security risk to Aotearoa New Zealand because the threats are diverse. The challenges for home-users are not necessarily the same challenges that our largest companies face.

Even the most innovative and future-focussed digital businesses and government services can fail if users are not confident that their data and privacy will be protected, or if users are concerned they are not safe online.

Dependable and secure provision of digital services

Transforming our economy and society requires people to have confidence in using digital services. Proactive uptake of digital technologies will only occur when citizens and businesses have trust and confidence in the services being provided to them digitally. This includes the transparent and effective protection of privacy, by government and by business, as well as the provision of user-centric digital services.

Work already underway

1. Cyber Security Strategy

NZ's Cyber Security Strategy⁴ sets the overall direction for cyber security for the period 2019–2023. The strategy provides a framework for government-led action, in partnership with the private sector. The strategy outlines priorities for action and where collaboration is needed across the public and private sectors. The priority areas are cyber security aware and active citizens, a strong and capable cyber security workforce and ecosystem, an internationally active, resilient and responsive New Zealand, and action to tackle cybercrime.

2. Detection and disruption

The National Cyber Security Centre (NCSC) provides malware detection, disruption and incident response services to New Zealand Government agencies, and to New Zealand's nationally significant organisations in the private sector. Through its CORTEX services and Malware Free Networks capabilities, the NCSC can provide New Zealand-specific threat intelligence to New Zealand organisations, and can inform New Zealand government officials of nation state threats to our country.

3. Incident response

The NCSC provides 24/7 incident response support to any cyber security threat impacting nationally significant organisations, involving state-sponsored actors, or which could have an impact on New Zealand's national security.

NCSC's incident response services includes forensic analysis and investigation capabilities, and can call on the breadth of the NCSC's detection, disruption services, intelligence, cyber resilience and functions, as well as its international partnerships.

CERT NZ supports New Zealanders impacted by a cyber security incident including individuals, organisations and businesses. CERT NZ works with other government agencies to support the response, as they help organisations manage and recover from the incidents.

4. Digital Safety Unit

In addition to existing funding for Netsafe's role under the Harmful Digital Communications Act, a Digital Safety Unit has been established within DIA. The unit builds on DIA's existing censorship compliance team to address online safety, hate speech, and violent extremism.

5. Algorithm Charter for Aotearoa New Zealand

To build transparency and accountability in the way that government uses data, the Government Chief Data Steward developed a new Algorithm Charter. By signing up to the Charter, signatories commit to implementing a set of principles that encourage transparency and accountability when using algorithms. Twenty-six public sector agencies are signatories to the Charter and significant shifts in practice have occurred since the Charter was introduced in 2020.

6. AI Strategy for Aotearoa New Zealand

Artificial intelligence and associated technologies are playing an increasing role in modern life, offering both unprecedented opportunities for human development and innovation, but also presenting risks that must be mitigated. Recognising that accessing the full benefits of AI will require building trust with citizens and consumers through transparent, ethical and human-centric AI, the government is working on an AI Strategy. This will demonstrate our commitment to the adoption of ethical and safe AI that enhances our economy, serves the public good, and builds our reputation internationally.

7. Data Ethics Advisory Group

Using and sharing data in an ethical way is an important trust issue. The Government Chief Data Steward's (GCDS) Data Ethics Advisory Group helps to maximise the opportunities and benefits from new and emerging uses of data, while responsibly managing potential risk and harms. Through this group, government agencies test their ideas and proposals about new and emerging uses of data.

⁴ dpmc.govt.nz/publications/new-zealands-cyber-security-strategy



8. Ngā Tikanga Paihere Guidelines

These guidelines draw on Te Ao Māori concepts to guide and inform the way goals, boundaries, and principles are set when it comes to data practice.

9. Digital identity

Digital identity (proving and verifying one's identity online) is central for secure, user-centred service delivery. It is a vital part of a modern digital economy and society, with the potential to deliver significant economic and social benefits. The Government has agreed to develop a Digital Identity Trust Framework in legislation. This will establish a regulatory framework to ensure that digital identity services are provided in a secure and privacy-enhancing way that is flexible and incorporates tikanga Māori.

10. All-of-Government Cloud Programme

This programme will help the public service accelerate the use and benefits of cloud technology. It will improve agencies' access to cloud services, adjust public sector policy settings to enable cloud use, and help agencies to migrate to the cloud. The Government Chief Information Security Officer is working with Cloud platform providers to create security templates that anyone in New Zealand can use. The templates apply a core set of security controls to their cloud environments and can maintain continuous assurance of those controls.

11. International agreements

People face many of the same challenges in democratic market economies around the world and digital products and services are often global. The government, businesses and civil society are building foundations for trust in the digital economy at the international level, e.g., the multi-stakeholder Christchurch Call to Action, the Global Partnership on AI (GPAI), and the OECD Network of Experts on AI. New Zealand also adopted the OECD Principles on Artificial Intelligence in May 2019.

12. Māori Data Governance

Work is underway with StatsNZ to co-design a model for data governance which embeds Te Ao Māori needs and interests in data.

Opportunities to improve trust

Digital transformation and the acceleration of digital innovation across Aotearoa New Zealand is critically dependent upon trust. Aotearoa New Zealand consistently ranks as having the lowest levels of corruption, with trusted institutions, a robust and independent media, and a public service that is recognised for embracing values such as integrity, fairness and openness. These worldwide perceptions of Aotearoa New Zealand as a trusted country have continued to increase over time, with recent shifts attributable to our approach to the Covid-19 pandemic. Aotearoa New Zealand is at the forefront at a time when trust is under threat in many other countries.

We have an opportunity to capitalise on our trusted brand by fostering consumer trust in digital services, and using our small size to embrace the network effects that often characterise other leading tech regions.

Strong levels of trust provide the foundation needed to enable digital innovation

As we adopt new digital services, and adapt existing technologies, users and providers must make sure technologies are deployed ethically, transparently, and responsibly. As we have seen with algorithmically driven social media and facial-recognition technology, people often don't fully understand or consider the implications for privacy, online safety, and social cohesion before they use the technology.

Establishing world-leading and responsive trust settings provides an opportunity to create a sustainable competitive advantage. A highly trusted environment and a track record of safe and ethical operations can differentiate Aotearoa New Zealand organisations doing business with the rest of the world. It can also encourage international organisations to do business with and invest in Aotearoa New Zealand.

There are significant opportunities for the government and other organisations to ensure that digital technologies are used in a way that generates trust and confidence.

1. Collaboratively shape the rules, standards and governance models needed to foster trust and confidence in emerging technology

Enabling all of Aotearoa New Zealand to flourish and prosper in a digital world requires widespread acceptance and deployment of digital across businesses and communities. Creating and fostering trust is critical to improving uptake, creating markets, and authorising innovative new technology. Priorities around this include:

- embedding ethical practice, principles of social responsibility, and accountability within the design of artificial intelligence and other new and emerging data-driven technology
- ensuring fit for purpose governance processes for the use of data-driven technology, including investigating the need for independent oversight
- establishing digital identity infrastructure to support the development of trusted people-centred digital identity services
- actively gauging social license, and raising awareness of the benefits of emerging technology within trusted frameworks – particularly when it comes to personal data
- building capability across the public service to further embed the Algorithm Charter for Aotearoa New Zealand
- developing guidance about a data governance approach that respects iwi and Māori interests in data.

2. Cyber security and resilience

Aotearoa New Zealand's Cyber Security Strategy 2019 states that a free, open, and secure internet and trusted underlying infrastructure and technology is critical for a functioning digital society. We must continue to implement the priorities of the cyber security strategy and adapt how the strategy is implemented to maintain and build information security and national resilience.

3. Digital safety online

Work across government is underway alongside key stakeholders to help people understand what can and cannot be trusted in the digital world; learn how to keep themselves safe and secure online; and feel confident there are protections against malicious online behaviour. A strategic framework for strengthening resilience to dis- and mis-information is being developed.

4. Digital government for a digital society

Government plays a role in building trust in digital. Well designed and customer-centric services will build comfort in digital and trust in the safety, security and fairness of the wider digital environment.

QUESTIONS:

- Q: What do you think about the issues and opportunities for trust?
- Q: What do you think of the immediate priorities, as outlined?
- Q: What might we focus on in the longer term?



Mahi Tahī – Inclusion: Making sure all New Zealanders can ride the digital wave

GOAL: All New Zealanders have the tools, services, and skills they need to participate in, contribute to, benefit from, and lead in the digital world.

What we want

Everyone should be able to access the benefits of digital technology

In an increasingly digital world, digital inclusion has become essential for participation in our modern society and economy. Being digitally included allows people to connect with friends and family, express their cultural identity, learn, create, share new ideas, and access job opportunities and goods and services. A digitally inclusive Aotearoa New Zealand means that all our people can seize these opportunities.

To achieve a fully digitally inclusive society, all New Zealanders will need:

- **Motivation** – they understand how the internet and digital technology can help us connect, learn, or access opportunities
- **Access** – they have access to affordable and appropriate internet, digital devices, and services
- **Skills** – they have the basic digital skills to use the internet and digital technology in ways that are appropriate and beneficial
- **Trust** – they trust in the internet and online services and are able to manage personal information and understand and avoid scams, harmful communication and misleading information.⁵

We estimate up to one in five New Zealanders may be being digitally excluded in some way right now.⁶ People most at risk of being excluded include but are not limited to people who are older, Māori, Pacific, disabled, living in a rural community, have children and live in a low socioeconomic community, are unemployed or underemployed, an offender or an ex-offender.

As a nation, we will need to overcome a range of barriers to build a digitally inclusive society

Barriers to inclusion differ for different groups of people. One solution cannot fix all problems for all people. For example, the cost of internet subscriptions and digital devices can be a barrier preventing some people from being digitally included, particularly people on low incomes.

Digital solutions do not work for everyone. For example, some disabled people may prefer face-to-face interaction. Some people may experience multiple barriers to digital inclusion, for example, if they have a low income and also live in a rural community with inadequate connectivity. Some people who are digitally excluded may face a range of other social and economic challenges, such as unemployment or low trust in government. These challenges can both contribute to and be a result of digital exclusion.

⁵ [Digital Inclusion Blueprint, 2019](#)

⁶ [Digital Inclusion Blueprint \(2019\)](#) and [Pulse of our Nation Report \(2017\)](#). Note however that some New Zealanders may choose not to participate in the digital economy and society (i.e. they may prefer to access services or interact face-to-face), while others may be physically unable to participate.

Supporting digital inclusion will also support the growth of our digital technology sector

Being digitally included is a necessary step to build the digital skills New Zealanders need to work in the tech sector or tech-enabled industries. A focus on digital inclusion therefore supports us to develop the skilled and diverse workforce needed to grow Aotearoa New Zealand's digital technology sector. Furthermore, as people become digitally included, there are more potential customers that our local tech firms can provide with digital goods and services.

A Māori perspective on digital inclusion

The Digital Inclusion User Insights – Māori report, May 2021, provides insights from Māori about the best ways to improve digital inclusion for Māori. Findings from the research include:

- **Affordability is key** – Māori say that unaffordable internet and devices is the primary barrier to digital inclusion within Māori communities. Along with improved skills, motivation, and trust, overcoming this barrier will bring Māori important social, economic and education benefits.
- **Leadership and power sharing is needed** – Māori leaders want to work with others to improve digital inclusion for Māori. They believe strong leadership from government on addressing the barriers to digital inclusion, coupled with a genuine willingness to partner with iwi, will play a major role in achieving that goal.

Read the Digital Inclusion User Insight- Māori report in English and te reo Māori [here](#).



Work already underway

1. Reliable and resilient infrastructure

The government has invested \$1.7 billion in improving Aotearoa New Zealand's connectivity infrastructure – through the Ultra-Fast Broadband Programme (UFB), Rural Broadband Initiative (RBI) and Mobile Blackspot Fund (MBS). This investment will mean that 99.8 percent of New Zealanders will be able to access ultra-fast broadband by the end of 2023. Work is also underway within MBIE to consider the future of New Zealand's connectivity, including the role that 5G technologies could play.

2. Digital Inclusion Blueprint

The [Blueprint](#), released in 2019, sets out the Government's vision for a digitally inclusive Aotearoa New Zealand. This Blueprint highlights that to be digitally included, people must have the **motivation** to want to engage in the digital world, **access** to affordable internet subscriptions and devices, the **skills** to use these technologies safely and effectively, and **trust** that they will be safe and secure online.

DIA's work to develop User Insights Reports has helped to build understanding of the key barriers to inclusion.

3. Equitable Digital Access

In 2020, COVID-19 highlighted the importance of being digitally included, and a range of initiatives to overcome the barriers to inclusion were launched with time-limited funding from the COVID-19 Response and Recovery Fund (CRRF).

These initiatives included the Ministry of Education's Equitable Digital Access programme which provided internet service to around 45,000 households of students, along with approximately 37,000 devices.

4. Digital skills training

DIA invested \$10 million in digital skills training for individuals and whanau, and a further \$5 million to support small-to-medium sized businesses to build their digital capabilities.

The government also provided a further \$30 million to keep and upskill public librarians, so they can support the digital literacy of library users. Further initiatives such as the Office for Seniors' Digital Literacy for Seniors programme have been working to improve digital inclusion for specific population groups.

Opportunities to improve digital inclusion

The Government has invested significantly in Aotearoa New Zealand's connectivity infrastructure over recent years, and a range of initiatives are underway or have been trialled to improve digital inclusion for different groups. However, we need to keep working to improve digital inclusion, and we think the priority areas outlined below can contribute towards our goal that all New Zealanders have what they need to participate in, contribute to, and benefit from the digital world.

1. Work towards holistic, scalable, and sustainable solutions for digital inclusion

We think we need holistic, scalable and sustainable solutions to increase digital inclusion and move Aotearoa New Zealand towards becoming a fully digitally inclusive society. This could involve providing free or subsidised internet subscriptions, devices, and digital skills training, to those people who need it most.

It would be important to partner with community organisations to help deliver this type of support. This partnership approach would help build people's confidence, trust and motivation to take up the support, and would help to ensure support was provided by people within the community who understand the wider challenges that recipients may face.

2. Develop a national digital literacy framework for Aotearoa New Zealand

A skills framework could provide a nationally consistent standard and agreed definition of basic digital literacy skills. It could also support better and more consistent measurement of digital skills in Aotearoa New Zealand and allow skills training programmes to be evaluated effectively.

3. Support greater coordination of digital inclusion initiatives

Increased coordination of digital inclusion initiatives could include promoting, and (depending on funding) potentially expanding, existing inclusion initiatives that are working well. This could help to encourage sharing of best practice across different organisations involved in improving digital inclusion, such as iwi, private sector representatives, Non-Government-Organisations, and agencies.

4. Improve how the government delivers services digitally

Work to improve how government designs and delivers human-centred services could include:

- Raising the profile across government and non-government organisations of the [New Zealand Government Web Standards](#);
- Upskilling and supporting agencies to practice design thinking when building and running government services, and;
- Developing and providing system-level tools and solutions for delivering inclusive digital services, or adding 'web accessibility' as part of the [All-of-Government ICT Operations Assurance Framework](#).

5. Make sure New Zealanders have connectivity that meets their needs

This priority would include ensuring government programmes and settings support future connectivity needs. It also includes implementing the Government's manifesto commitment to improve rural connectivity.

6. Ensure non-digital access to government services

The priority areas outlined above will go some way towards reducing people's demand for non-digital access to government services. However, it will be important to ensure that people who still cannot or do not want to access government services digitally can access them non-digitally, including their entitlements.

To ensure continued non-digital access to government services for people who need them could include improving non-digital channels for communication, booking appointments and accessing forms. It could also include supporting small, localised community hubs to provide support from trusted community members, drawing on existing channels (such as rural, provincial and urban community organisations, marae, churches, libraries, clubs).

QUESTIONS:

- Q: What do you think about the issues and opportunities for Inclusion Mahi Tahī?
- Q: What do you think of the immediate priorities, as outlined?
- Q: What might we focus on in the longer term?
- Q: What else would you propose?

Mahi Ake – Growth: Leveraging what makes New Zealand unique

GOAL: Our tech sector continues to be fast growing and becomes more inclusive, selling home-grown IP the world over, and all our businesses are quickly adopting technology in order to grow.

What we want

Our vibrant tech sector is a growing contributor to our economy

Aotearoa New Zealand already has a vibrant and growing tech sector that creates high value jobs and generates low emissions export revenue. Digital businesses tend to be less constrained by physical and natural resource limitations than other businesses and can export without the need to place goods on a ship (hence the term “weightless” exports). With a clear direction and dedicated plan in place, this sector can contribute a much larger proportion of Aotearoa New Zealand’s GDP and help cement a diversified and resilient economy.

Digitally enabled businesses

All businesses can increase their productivity by adopting digital technologies, for example, in marketing, payroll management, supply chains and logistics. Many businesses are well on their way while others are starting out on their journey. The COVID-19 lockdowns of 2020 showed that small businesses that used five or more digital applications in their business experienced a 33 percent lower fall in revenue and 40 percent fewer job losses than other small businesses during the COVID-19 crisis.⁷

New Zealanders with digital skills

Being digitally capable will help New Zealanders move into more technology-enabled roles and interact confidently with digital services. Overcoming the barriers to digital inclusion (including access and affordability) and equipping New Zealanders with digital skills will help us to take full advantage of the growth opportunities from technology. More and more jobs will require some element of digital skills, and jobs relying on technical and/or creative skills will tend to be protected from risks of automation and have better long-term pay and prospects. The task that lies before us is to help New Zealanders develop the digital capabilities they need now, and in our future.

Reliable and resilient connectivity infrastructure

Access to reliable and resilient connectivity is a necessary precursor for growth. Government has invested \$1.7 billion in improving Aotearoa New Zealand’s connectivity infrastructure, including the Ultra-Fast Broadband Programme (UFB), the Rural Broadband Initiative (RBI) and the Mobile Blackspot Fund (MBS). In 2020, a further \$50 million was put towards improving rural broadband connectivity. We will need to keep investing in connectivity, including considering the role that 5G will play.

Vibrant international connections

Digital technologies allow Aotearoa New Zealand to operate in a global marketplace, where traditional boundaries are no longer relevant. Aotearoa New Zealand has a strong standing on the international stage, which offers us scope to leverage for stronger economic and social outcomes. The Digital Strategy for Aotearoa will also provide the review of wider policies that affect digital trade and the digital economy which the government decided to undertake as part of its response to the recommendations of the Trade for All Advisory Board.

⁷ Xero Small Business Insights Report September 2020

Work already underway

Work is underway across government, communities and industry to increase the digital capability of Aotearoa New Zealand businesses and help accelerate the growth of our already vibrant and growing digital technology sector.

1. Digital Technologies Transformation Plan (ITP)

The government is working with the digital technology sector, through industry organisation NZ Tech, to design and implement a plan that will grow the sector's export revenue, increase the numbers of high quality jobs for New Zealanders, and enhance the diversity of the industry's workforce. The ITP includes work to promote New Zealand's success in digital technology to a global audience, and the implementation of a suite of actions that will grow digital skills needed to sustain the expansion of the sector. It also focusses on building the participation by Māori in the tech industry and advancing the development of a NZ Artificial Intelligence (AI) Strategy.

2. Supporting businesses to undertake research and development

This includes work with Callaghan Innovation and through the Research and Development (R&D) Tax Incentive scheme. R&D creates new knowledge, new or improved processes, services and goods, and skilled jobs for more New Zealanders.

3. NZ Growth Capital Partners

NZ Growth Capital Partners manage investment funds to stimulate a capital market for early-stage technology companies. This makes it easier for businesses to attract early investment, so they can grow.

4. Digital Boost initiative

This initiative was designed with small business advisors, industry experts, and small businesses. It aims to inspire and motivate New Zealand businesses to go digital. The Digital Boost™ initiative includes the:

- Digital Boost™ Spotlight Series
- Digital Boost™ Skills Training and Support
- Digital Boost™ Directory
- Digital Boost Alliance – this group is made up of more than 20 key businesses and organisations that have committed to helping grow the use of digital technologies in Aotearoa New Zealand.

5. Digital Commerce programme

This NZTE programme works with exporters to enable global sales in digital marketplaces. It provides support and advice to interested businesses and can also connect businesses with an advisor for one-on-one support to help access specific markets.

6. 5G rollout programme

Progressing the roll-out of 5G and other emerging technologies will ensure Aotearoa New Zealand keeps pace with global developments and provide a platform for the next wave of productivity and innovation. Māori and the Crown are engaging constructively to seek an enduring, long-term agreement that will address Māori interests in radio spectrum.

The allocation of long-term spectrum rights for 5G is on track to take place prior to those rights beginning in November 2022. Preparations for allocation of spectrum for 5G are happening concurrently with the Crown's discussions with Māori, which are progressing constructively.

7. International agreements

The Ministry of Foreign Affairs and Trade (MFAT) negotiates rules across a range of international agreements to make it easier for Aotearoa New Zealand businesses and consumers to participate in the global digital market. Examples of initiatives include E-commerce negotiations at the World Trade Organisation (WTO), Free Trade Agreement negotiations with the European Union and United Kingdom, and The Digital Economy Partnership Agreement (DEPA) with Singapore and Chile (and potentially others) which provides common rules for participants on all aspects of the digital economy.

Opportunities for growth

Aotearoa New Zealand is already experiencing economic growth from the adoption of digital technologies. The domestic tech sector continues to grow, and more businesses are realising the potential of digital processes. We can take actions to help accelerate this growth, and to shape it so that all New Zealanders can benefit from it.

1. Complete the Digital Technology Industry Transformation Plan (ITP)

The Government's growth priority is to complete the ITP and make sure that the action plan is appropriately resourced. The focus will include growing talent domestically (leading to jobs for New Zealanders) and building greater diversity into the workforce. It will also include efforts focused on how to encourage more Māori participation in the digital sector and building connections in the Māori tech ecosystem. The ITP supports the growth of specific subsectors where Aotearoa New Zealand has demonstrated global success, including interactive media, and Software-as-a-service (SaaS), and is advancing the New Zealand Tech Story, which will work to shift global perceptions around our tech and innovation capabilities. The potential of data and how we can encourage greater use of data, including considering the role of a digital twin framework, is also within scope of the ITP's work programme.

2. Continue to support businesses through Digital Boost

The Digital Boost programme is being extended and expanded through an additional \$44 million committed through Budget 2021. The \$44 million budget boost is to maintain and expand the current initiative for the next two financial years. This includes creating Digital Business Advisory Services, which will help business owners to implement their own digital business initiatives. Over 200 training videos were translated into te reo in time for launching in the Māori language week in September 2021.

Building a strong talent pipeline: To be a leading digital nation that fosters improved jobs and wellbeing for its population, we need to continually focus on equipping our people with digital skills. This will come from an education sector that delivers core digital skills and creates visible and accessible career pathways for all New Zealanders, including Māori and Pacific peoples. Industry will also play a crucial role in investing in its workforce at all stages of a career.

While growing talent domestically will be our first focus, in some cases, we will want to use immigration as a source of specialised expertise. These people will likely be experienced senior executive professionals, who can upskill our domestic workforce through this exposure. We will need to consider how we reopen our border and the settings needed to attract highly skilled workers, and what obligations we can place on them to create value for Aotearoa New Zealand.

QUESTIONS:

- Q:** What do you think about the issues and opportunities for growth?
- Q:** What do you think of the immediate priorities, as outlined?
- Q:** What might we focus on in the longer term?
- Q:** How can government and industry best work together to realise the growth potential for New Zealand?



Wider work across business and community sectors across all three themes

Businesses and communities are leading a range of activities that will support New Zealanders to be digitally enabled across each of the three themes outlined above. We welcome information from different organisations on this activity and will endeavour to reflect this in the Digital Strategy for Aotearoa.

QUESTIONS:

- Q:** What is happening in your community to help people (community groups and businesses) to be more digitally enabled?
- Q:** Tell us more about how well it has worked and why?

Ka pēhea tā mātou aroturuki i tā mātou kokenga

How we will track our progress

To understand how New Zealand is progressing towards the proposed vision, we need a clear picture of what success looks like, and the steps towards achieving this.

Clear goals and measures are important. But getting quality data on the digital aspects of our economy and society is a significant challenge – one that all countries face. Some of the data does not yet exist. The table below sets out outcomes for each theme, existing indicators we could use to understand progress, and future indicators the government is exploring. These should provide a comprehensive view of progress against the outcomes.

Theme	Existing indicators – or available soon	Future indicators – planned or being explored
<p>MAHI TIKA Outcome: We have the right foundations to sell our products and services to the world with confidence, while all New Zealanders embrace the digital future because they feel safe and secure.</p>	<ul style="list-style-type: none"> Percentage of New Zealanders who feel 'safe' or 'very safe' when using internet for online transactions. New Zealand's international soft power ranking, which considers the country's reputation and influence. New Zealand's international ranking for ease of doing business. 	<ul style="list-style-type: none"> Level of trust New Zealanders have in organisations that have been affected by a cyber incident or data breach. Changing levels of concern about issues of individual privacy and personal information.
<p>MAHI TAHI Outcome: All New Zealanders have the tools, services, and skills they need to participate in, contribute to, benefit from, and lead in the digital world.</p>	<ul style="list-style-type: none"> Type of internet available in New Zealand, by suburb and with demographic data overlaid (including ethnicity). Upload and download speeds, by suburb and with demographic data overlaid (including ethnicity). Percentage of homes and businesses with access to ultra-fast broadband. 	<ul style="list-style-type: none"> Percentage of New Zealanders who have the skills and confidence needed to use the internet for a range of activity, for example government services, shopping, banking, social interaction and entertainment.

Theme	Existing indicators – or available soon	Future indicators – planned or being explored
<p>MAHI AKE Goal: Our tech sector continues to be fast growing and becomes more inclusive, selling home-grown IP the world over, and all our businesses are quickly adopting technology in order to grow.</p>	<ul style="list-style-type: none"> • ICT sector's contribution to GDP. • People employed within New Zealand's ICT sector. • Gross employment earnings within the ICT sector. • Numbers of SMEs accessing digital training (including via Digital Boost) 	<ul style="list-style-type: none"> • The digital sector's contribution to GDP. • Value of digital sector exports, with sub-sets for Māori business. • People employed within New Zealand's digital sector. • Gross earnings within the digital sector, with sub-sets for Māori business. • Use of cloud computing. • Impact of any targeted assistance.

Evidence will ensure we understand what's working

High-level measures tell part of the story, but these measures must be supported by evidence. To make sure we understand what interventions work and what we should do more of, our evidence base will also be supported by research and evaluation, reporting frameworks and new sources of data.

QUESTIONS:

- Q:** What are your thoughts comments on the proposed progress indicators?
- Q:** What else would you suggest?



Kuputaka

Glossary of terms

5G technology 5G is the 5th generation of mobile technology. It enables higher rates of data transmission, reliability, and connectivity than earlier 3G and 4G technologies.

Algorithm A process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.

Artificial Intelligence or AI A computerised system capable of simulating human decision making and learning, including performing cognitive functions associated with the human mind including learning and language.

Christchurch Call The Christchurch Call is a commitment by Governments and tech companies to eliminate terrorist and violent extremist content online. For more information, refer to www.christchurchcall.com

Cyber-attack/s Deliberate exploitation of information system to cause harm.

Cybercrime Crimes that are committed using computer systems and are directed at computer systems. Examples include producing malicious software, denial of service attacks, and phishing.

Cyber security Protecting people and their computers, networks, programmes and data from unauthorised access, exploitation, or modification.

Digital infrastructure Digital infrastructure comprises the physical resources that are necessary to enable the use of data, computerised devices, methods, systems and processes.

Data Facts and statistics collected together for reference or analysis.

Digital Available in electronic form, readable and manipulable by computer.

Digital access Digital access is the ability to fully participate in digital society. This includes access to tools and technologies, such as the Internet and devices. Digital access can also refer to whether online materials are designed to be accessible for disabled people (e.g. for blind people using text-to-speak programmes).

Digital age The digital age started in the 1970s with the introduction of the personal computer and is continuing with ongoing innovation in the 21st century.

Digital divide The digital divide refers to the gap between demographic population segments and regions that have access to modern information and communications technology, and those that don't or have restricted access.

Digital environment A digital environment is an integrated communications environment where digital devices communicate and manage the content and activities within it.

Digital exclusion Digital exclusion refers individuals and population groups that do not have access to affordable internet or devices, or do not have the skills, motivation or trust to engage in the digital world.

Digital identity Digital identity is how you show who you are online. A person's digital identity can be any information about them, that they use to access online services. For example, proof of age, qualifications or address.

Digital inclusion A digitally included person is someone who has access to affordable and accessible digital devices and services at a time and place convenient to them, as well as the motivation, skills, and trust to use them.

Digital literacy The essential digital skills you need to live, learn, and work in a society where communication and access to information is increasingly through digital technologies like internet platforms, social media, and mobile devices. This excludes higher-level skills – e.g. programming.

Digital services The electronic delivery of information and services including data and content across multiple platforms and devices like web or mobile.

Digital skills The skills people need to engage in the digital world from both an essential level (e.g. digital literacy) to more advanced skills needed to work in the technology sector (e.g. programming skills).

Digital technology/technologies Digital technologies are electronic tools, systems, devices and resources that generate, store or process data. Well known examples include social media, online games, multimedia and mobile phones.

Digitisation The conversion of content (e.g. text, pictures, or sound) or business processes into a digital form that can be processed or supported by digital technologies.

Facial-Recognition Technology Facial recognition is a way of identifying or confirming an individual's identity using their face. It can be used to identify people in photos, videos, or in real-time.

Internet of Things (IoT) Computing devices connected to the internet and embedded into everyday objects, enabling them to send and receive data.

Machine learning The use of computer systems that can learn and adapt without following explicit instructions, by using algorithms and statistical models to analyse and draw inferences from patterns in data.

Phishing Using fraudulent emails to persuade people to reveal confidential information, such as login or banking information.

Privacy/Information privacy Broadly speaking, privacy is the right to be let alone, or freedom from interference or intrusion. Information privacy is the right to have some control over how your personal information is collected and used.

Ransomware A type of malicious software that locks up the files on the information system until a ransom is paid.

Software The programmes used by a computer, as well as other information that it relies on to operate.

The cloud/cloud computing The cloud is a network of remote servers which either store and manage data, run applications, or deliver content or a service such as streaming videos, web mail and software. Instead of accessing data from a local computer network, you access them online.

Te Ao Māori The Māori world view.

Trust Firm belief in the reliability, truth, or ability of someone or something. In the digital environment, people, organisations and communities need to have confidence that the environment they are using is safe and secure.

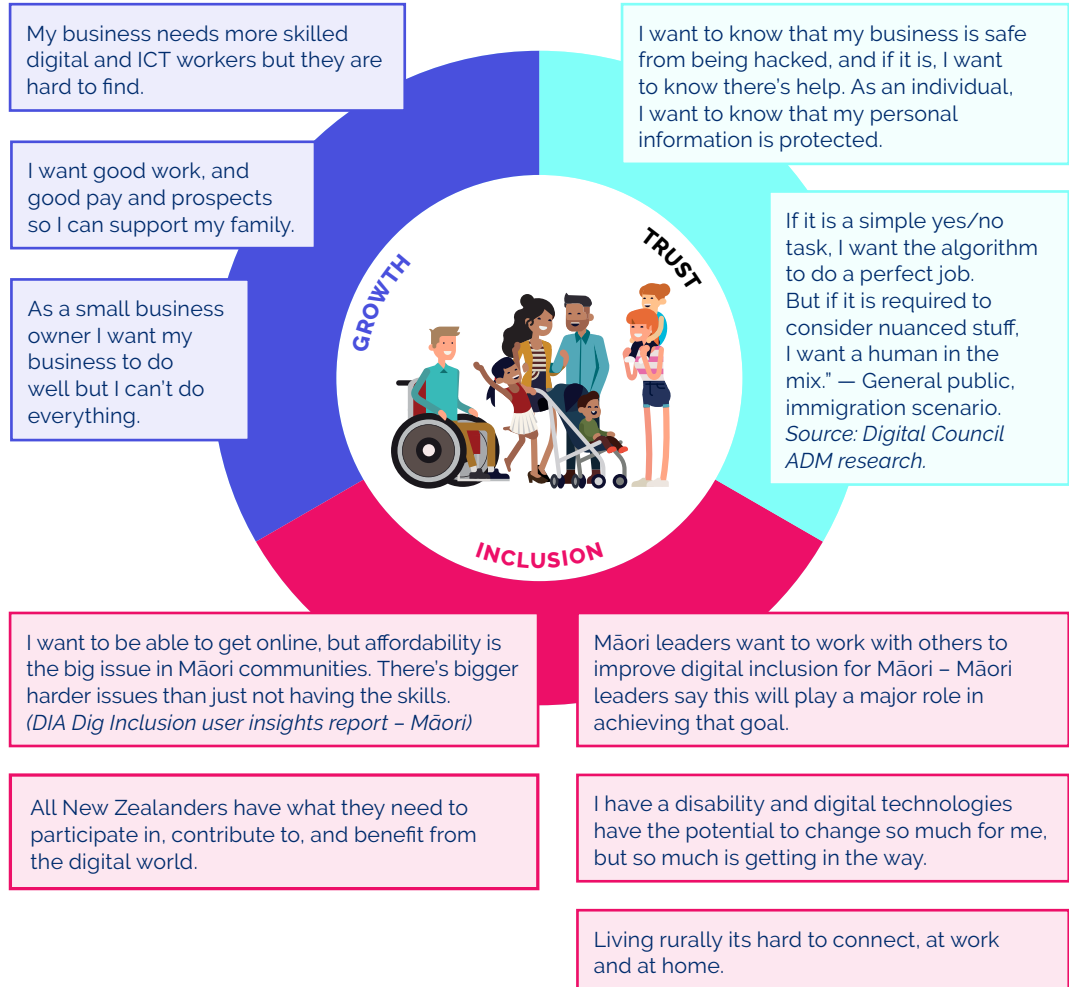
Weightless economy The term weightless economy refers to the trade in intangible or abstract products and services digitally over the internet, without the need for physical transport.

Ngā pūtake raraunga

Data sources

Indicator	Source	Link to public source if available
MAHI TIKA (TRUST)		
Safety making online transactions	NZGSS - Wellbeing Statistics	https://www.stats.govt.nz/information-releases/wellbeing-statistics-2018
Cyber Security Incident Reports	CertNZ Quarterly Report	https://www.cert.govt.nz/assets/Uploads/Quarterly-report/2021-q1/quarterly-report-data-landscape-2021-1-january-31-march.pdf
Confidence using digital devices	BNZ Digital Skills Survey	https://blog.bnz.co.nz/wp-content/uploads/2021/04/BNZ_Digital-Skills-Report-2021.pdf
MAHI TAHI (INCLUSION)		
Fibre access	Crown Infrastructure Partners	https://www.crowninfrastructure.govt.nz/wp-content/uploads/CIP-Broadband-Quarterly-Update-Q1-March-2021.pdf
Percentage of internet users	DataReportal (Kepios)	https://datareportal.com/reports/digital-2020-new-zealand
Internet coverage map	Census 2018	http://nzdotstat.stats.govt.nz/wbos/Index.aspx?DataSetCode=TABLECODE8429
NZ digital skills	BNZ Digital Skills Survey	https://blog.bnz.co.nz/wp-content/uploads/2021/04/BNZ_Digital-Skills-Report-2021.pdf
MAHI AKE (GROWTH)		
ICT sector value added	Annual Enterprise Survey 2019	Custom Stats NZ data extract (email info@stats.govt.nz)
ICT sector employment	Business Demography Statistics 2020	Custom Stats NZ data extract (email info@stats.govt.nz)
Software R&D spending	R&D Survey 2020	https://www.stats.govt.nz/information-releases/research-and-development-survey-2020
Published Software exports	ICT Supply Survey 2019	https://www.stats.govt.nz/information-releases/information-and-communication-technology-supply-survey-2019

What some New Zealanders are saying about the role digital technologies can play in New Zealand's future and the challenges they face: Examples and themes





Te Kāwanatanga o Aotearoa
New Zealand Government