

# Te Rautaki Matihiko mō Aotearoa The Digital Strategy for Aotearoa

Enabling Aotearoa New Zealand's people, communities, economy, and environment to flourish and prosper in the digital era.

---

SEPTEMBER 2022



**Te Kāwanatanga o Aotearoa**  
New Zealand Government

**ISBN (online) 978-1-99-104126-5**

**ISBN (print) 978-1-99-104127-2**

### **About the Digital Strategy for Aotearoa**

This Strategy was developed by a cross-agency team with officials from Hīkina Whakatutuki the Ministry of Business, Innovation and Employment (MBIE), Tatauranga Aotearoa Stats NZ, Te Tari Taiwhenua the Department of Internal Affairs (DIA), Te Tari o Te Pirimia me te Kōmiti Matua the Department of the Prime Minister and Cabinet (DPMC), and the National Cyber Security Centre (NCSC). The Ministry of Foreign Affairs and Trade supported development of the Strategy.

Hon Dr David Clark, Minister for the Digital Economy and Communications received support from his colleagues in the Digital Ministers Group in developing this Strategy. Learn more about the Group in Appendix Two.

### **Acknowledgements**

People from across the country helped develop this Strategy by participating in the engagement and submissions process for the discussion document "[Te keko ki tētahi Rautaki mō Aotearoa: Towards a Digital Strategy for Aotearoa](#)" from October to December 2021. It was fantastic to hear from hundreds of people who attended virtual hui, made written submissions, and added their ideas and comments to the online discussion. Thank you.

# Contents

<b>Minister's Foreword</b>	<b>1</b>
<b>Chief Executives' Foreword</b>	<b>2</b>
<b>A vision for a digital Aotearoa</b>	<b>3</b>
What could it look like in 2032 if we reached this vision?	3
<b>Digital Strategy for Aotearoa New Zealand</b>	<b>4</b>
<b>Three strategic themes for the Strategy and measuring our progress</b>	<b>5</b>
These themes work together, and are supported by strong foundations	6
<b>How will we know we are successful?</b>	<b>7</b>
<b>Realising Māori aspirations</b>	<b>8</b>
Te Tiriti o Waitangi / The Treaty of Waitangi	9
<b>Opportunities</b>	<b>11</b>
Opportunities	11
Challenges	12
<b>Mahi Tika: Trust</b>	<b>14</b>
What we want	15
Focus areas: Mahi Tika – Trust	17
<b>Mahi Tahi: Inclusion</b>	<b>21</b>
What we want	22
Focus areas: Mahi Tahi – Inclusion	23
<b>Mahi Ake: Growth</b>	<b>29</b>
What we want	30
Focus areas: Mahi Ake – Growth	31
Spotlight on skills and education	39
<b>Putting the Strategy into action</b>	<b>40</b>
Our approach for implementation: experience, learn, adjust	40
Measuring success	41
Working together	41
Oversight and direction-setting	42
<b>Appendices</b>	<b>43</b>
Appendix One: The scope of this strategy	43
Appendix Two: Members of the Digital Ministers Group	44
Appendix Three: Reflecting the views of New Zealanders in the Digital Strategy	45
Appendix Four: The support of other strategies	45
Appendix Five: Understanding our digital landscape	46

# Minister's Foreword

*E ngā mana, e ngā reo, e ngā karangatanga maha huri noa i te motu, tēnā koutou, tēnā koutou, tēnā koutou katoa. Nāku te maringi nui ki te whakatū i tēnei Te Rautaki Matihiko mō Aotearoa.*

New Zealand stands on the precipice of a huge opportunity to design, build and use digital technologies in world-leading, ethical, equitable ways that reflect the culture and uniqueness of our country.

To get there, we need to ask ourselves hard questions like:

- How can we build on New Zealand's inherently high levels of trust to benefit society, and the economy?
- What would it mean to be the first country to embrace the ethical deployment of Artificial Intelligence?
- Are we courageous enough to unlock the benefits of widespread digital thinking?

Digital technologies and data provide an opportunity to transform the way services are delivered, help us address big issues like climate change, and bolster our economy through the development of innovative, weightless exports.

This inaugural Digital Strategy for Aotearoa sets the ambition and direction for what we want to achieve, acknowledges the challenges and opportunities, and establishes the first action plan that will put us on the path to get there.

We need to be ambitious and courageous, taking what makes New Zealand great and using it to lead on the world stage. To borrow a metaphor from one kaumātua, our future digital economy presents a wave of opportunity. Provided all our people can put their boards in the water, New Zealand will flourish and thrive.

The Strategy is centred around three key themes: Mahi Tika — Trust; Mahi Tahī — Inclusion; and Mahi Ake — Growth. The work progressed within these themes presents a strong launch pad for a world-leading digital nation we can all be proud of. The Strategy also reflects the Crown's responsibility to give effect Te Tiriti o Waitangi / the Treaty of Waitangi in its work across the digital domain.

Throughout the engagement on the strategy, I had the privilege to hear people across Aotearoa speak about what a digital future for Aotearoa looks like to them. This strategy is our first step into that future, and I do hope you'll join us.

In New Zealand, we see tomorrow first. This can be true in more ways than one.

Nāku iti nei



Hon Dr David Clark  
Minister for the Digital Economy and Communications

# Chief Executives' Foreword

*E ngā hau e whā o te motu tēnā koutou, tēnā koutou, tēnā koutou katoa. Ko ngā kupu whakataki a Ngā Kaiwhakahaere Matua a te Kāwanatanga Matihiko e pā ana ki te whakatakoto i to tātou ahuatanga rautaki.*

To the four winds from across our nation greetings, greetings one and all greetings. This is the foreword and welcome from the chief executives of contributing agencies.

The digital history of Aotearoa New Zealand is fairly recent. The first computer in New Zealand was introduced to the Treasury in 1960 to process the payroll of approximately 32,000 public servants. Fast forward 60 years and computers, software and digital data are woven into the fabric of our daily lives, so much so that they fade into the background.

Change continues to happen at a rapid pace. The Digital Strategy for Aotearoa will help ensure that collectively, Aotearoa New Zealand sets a clear path for a thriving, equitable digital future, for today and for future generations. The potential benefits across Aotearoa of digital and data-driven technologies are huge — from empowering our current and future leaders, to mitigating climate change — but they will not happen without proactive, ongoing, joined up effort.

Hīkina Whakatutuki the Ministry of Business, Innovation and Employment, Tatauranga Aotearoa Stats NZ, and Te Tari Taiwhenua the Department of Internal Affairs have worked together on developing this Strategy, along with other government agencies. We have also drawn on the knowledge and ideas of hundreds of New Zealanders and organisations during the engagement process held from October to December 2021. Government agencies must continue to work together, with wider agencies, communities, and the private sector, to become even more joined up and effective in our approach.

As Chief Executives, we will be working together as a new Digital Executive Board to ensure this Strategy is successful in its implementation. This Strategy is just the starting point, and we need to continue to assess what work is underway, how much impact it is having, and to shift our focus if needed, to work towards the Strategy's vision and goals.

Nō ngā Kaiwhakahaere Matihiko matua,



**Paul James**

Chief Executive of Te Tari  
Taiwhenua the Department  
of Internal Affairs  
Government Chief  
Digital Officer



**Carolyn Tremain**

Chief Executive, Hīkina  
Whakatutuki the Ministry  
of Business, Innovation and  
Employment



**Mark Sowden**

Government Statistician and  
Chief Executive, Tatauranga  
Aotearoa Stats NZ  
Government Chief  
Data Steward



## A vision for a digital Aotearoa

Our vision is that Aotearoa New Zealand's people, communities, economy, and environment are flourishing and prosperous in the digital era.

### What could it look like in 2032 if we reached this vision?

Aotearoa New Zealand is a more equitable, innovative place with a healthy democracy and a strong economy. Our country is resilient, sustainable, and ready for the future. Digital technologies and data support wellbeing, providing opportunities to 'earn, learn and thrive'. Everyone accesses and uses the internet and digital technologies in ways that work best for them. Digital tools and services are trustworthy and accessible. We can trust organisations to collect, use and store our data in secure and culturally appropriate ways. Te ao Māori views on data are a key part of our digital and data system. Our ways of doing things and the products and services we build reflect our country's unique features and history. Online spaces where we interact are safe and welcoming.

Iwi, hāpū, government, businesses and other organisations use digital tools, services and data to solve problems, support cultural expression, and support the work of people. We use data and digital technology to address big issues of our time like climate change. A thriving ecosystem of businesses create and sell digital products and services within Aotearoa New Zealand and to the rest of the world. Our tech workforce is as diverse as our country's population and people can thrive in fulfilling digital careers.

People learn, adapt, and gain new digital skills throughout their lives. Anyone can access a broad range of resources and training through their workplace, their community, and formal education. We have reliable, secure internet and data infrastructure that serves the whole country. People have access to affordable digital devices and internet connections.

Government agencies provide holistic, equitable, trustworthy, user-centred services that give effect to Te Tiriti o Waitangi/the Treaty of Waitangi and its principles. The government responds to emerging digital trends. It addresses risks, embraces opportunities, and collaborates locally and internationally.

This Strategy aims to help make this vision a reality. We want Aotearoa New Zealand to secure its place as a world-leading, trusted, thriving digital nation.

# Digital Strategy for Aotearoa New Zealand

**VISION:** Aotearoa New Zealand's people, communities, economy and environment are flourishing and prosperous in the digital era



## MAHI TIKA: TRUST

**Goals:**

- New Zealanders feel safe and empowered in online environments
- Organisations and businesses design and use digital technologies and data systems in fair, culturally appropriate, trustworthy ways
- Our digital and data infrastructures are fit-for-purpose and secure



## MAHI TAHI: INCLUSION

**Goals:**

- All New Zealanders have the tools, skills and confidence to participate in an increasingly digital society
- Digital infrastructure, content and services meet people's diverse needs



## MAHI AKE: GROWTH

**Goals:**

- Our businesses and organisations innovate and increase productivity using digital technologies and data
- We have a thriving, fast growing and inclusive tech sector

**MEASURES OF SUCCESS:** We know we will be successful when...

- The economic impacts of cyber-incidents in New Zealand are lower than in comparable nations
- All New Zealanders are able to use verified digital identity should they choose to
- All New Zealanders feel safe and supported online

- All New Zealanders have the tools, skills and confidence to do all they want online
- High-speed internet is available to all New Zealanders
- All New Zealanders can afford a quality internet connection and internet enabled device

- Digital & ICT exports are on track to becoming New Zealand's leading export earner
- All New Zealand businesses are born digital, and supported to adopt the digital tools that work for them
- The digital sector employs more than 10% of the New Zealand workforce in high value jobs

**FLAGSHIP INITIATIVES:**

- Digital Boost
- Improving rural connectivity
- Accelerating Māori Innovation
- Christchurch Call
- New Zealand's Cyber Security Strategy
- Data as a tool for decision-making and wellbeing
- Innovation Development Grant
- Māori Data Governance
- Digital Technologies Industry Transformation Plan
- Digital Identity Services Trust Framework
- Te Ara Paerangi – Future Pathways

# Three strategic themes for the Strategy and measuring our progress

The Strategy is framed around three connected themes, which are supported by goals and measures. Measuring progress against Trust, Inclusion and Growth will help us to realise our vision for a digital Aotearoa.



## MAHI TIKA: TRUST

**Goals:** New Zealanders feel safe and empowered in online environments. Organisations and businesses design and use digital technologies and data in fair, culturally appropriate, trustworthy ways; and our digital and data infrastructures are fit-for-purpose and secure.

**Measures:**

- All New Zealanders feel safe and supported online
- The economic impacts of cyber-incidents in New Zealand are lower than comparable nations
- All New Zealanders are able to use verified digital identity should they choose to.



## MAHI TAHI: INCLUSION

**Goals:** All New Zealanders have the tools, skills and confidence to participate in an increasingly digital society; and digital infrastructure, content and services meet peoples' diverse needs.

**Measures:**

- High-speed internet is available to all New Zealanders
- All New Zealanders have the tools, skills, and confidence to do all they want online
- All New Zealanders can afford a quality internet connection and internet enabled device



## MAHI AKE: GROWTH

**Goals:** Our businesses and organisations innovate and increase productivity using digital technologies and data; and we have a thriving, fast growing and inclusive tech sector.

**Measures:**

- Digital & ICT exports on track to becoming New Zealand's leading export earner
- All New Zealand businesses are born digital, and supported to adopt the digital tools that work for them
- The digital sector employs more than 10% of the New Zealand workforce in high value jobs.



### The three themes in te reo Māori

Each of the three themes has a te reo Māori name, supported by an English name. These three te reo Māori names are not direct translations of the English concepts, rather both concepts support each other.

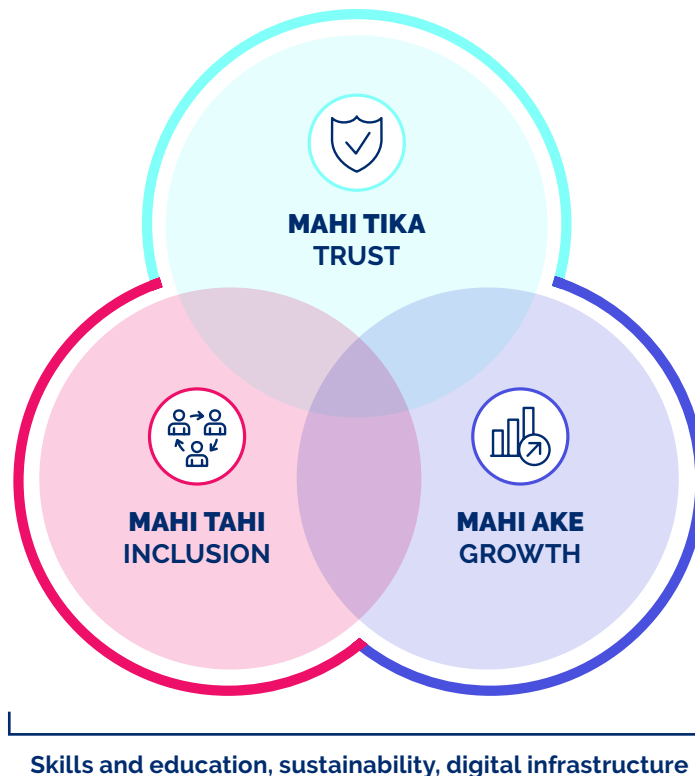
**Mahi Tika – Trust:** *mahi* is to work, perform, practice and to raise, and *tika* is true, be correct, right, fair, proper. Together these kupu (words) translate as “trust” for the Digital Strategy.

**Mahi Tahī – Inclusion:** working together, collaboration, cooperation and teamwork. Together these kupu describe inclusion for the Strategy.

**Mahi Ake – Growth:** the translation for “*ake*” is upwards, in an upwards direction. Together with “*mahi*”, these kupu translate to growth.

## These themes work together, and are supported by strong foundations

### The three themes of the Digital Strategy for Aotearoa



**All the themes need to be underpinned by a strong focus on:** skills and education, sustainability, and digital infrastructure.

**The three themes do not sit alone.** Trust, inclusion and growth connect to each other in many ways:



**The themes support each other.** For example, having a more diverse range of people developing technology can lead to people trusting that technology more. Increasing trust will support economic growth by improving New Zealand's reputation as a reliable trade partner.



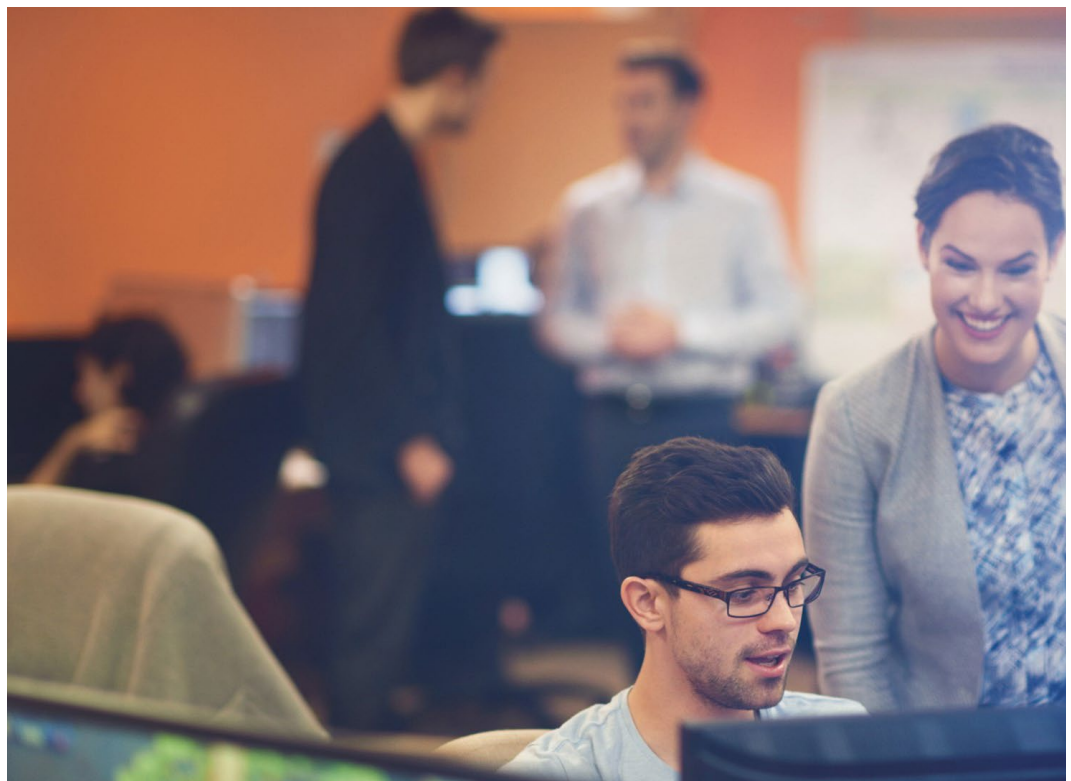
**Actions and issues might fall into multiple themes.** For example, reliable, fit-for-purpose internet infrastructure is important for both inclusion and growth. Ensuring that infrastructure is resilient and secure is important for both trust and growth.



**The themes have tension between them.** For example, to create fair and trustworthy digital and data systems, we may need to closely regulate or avoid some uses of digital technologies that could grow our economy.

## How will we know we are successful?

The measures for each theme will guide our journey and help us to assess progress. These measures are purposely high-level and may change over time. It is challenging to get quality data on the digital parts of our society and economy. We will continue to improve these measures and the ways we collect data.





## Realising Māori aspirations

Work towards a thriving and equitable digital future for Aotearoa provides an unprecedented opportunity to realise the aspirations for our nation's tāngata whenua and Te Tiriti o Waitangi / the Treaty of Waitangi partners in the digital era, both collectively and as individuals.

*"What we've traditionally seen are systems and initiatives that are not designed with Māori and Pasifika in mind, and it can take generations for us to crawl our way back [to equity]. What excites me the most about this process, is that it's new, which means we can feed in what it should look like, with us at the centre."* — participant, Māori virtual hui

Four core themes emerged from engaging with Māori about their aspirations for the Strategy. The Strategy reflects these themes. Initiatives and funding for carrying out this Strategy will also need to pay specific attention to these themes.

- **Rangatahi are the future in technology.** The future of technology should be a safe and welcoming space for rangatahi (young people). Te ao Māori should thrive and influence how data, digital and technology develop.
- **Genuine collaboration on the vision and actions.** We must collaborate to reach the ambitions of the Strategy, as a digitally-inclusive Aotearoa. This collaboration must centre around the aspirations and needs of whānau and communities.
- **Strengthening cultural identity and wellbeing.** Digital technology can help revitalise cultural identity and wellbeing by improving accessibility and the protection of mātauranga for those who want it.
- **By Māori, for Māori' approaches drive change.** Most advancements in data, digital and technology have not been made with Māori in mind. To create fair and equitable outcomes for Māori, the Strategy must make significant room for approaches that are 'by Māori, for Māori'.

*"We need to prioritise having the right relationships and addressing the needs [of communities] rather than just pushing stuff onto [them]. Developing systems that work in service of the aspirations of Māori communities. It's enabling technology."* — Participant, Māori virtual hui

### Ancient Navigation Mātauranga Concept Design

The Ancient Navigation Mātauranga Concept Design will apply a te ao Māori understanding to the digital world. It will draw on ancient Māori and Polynesian navigation mātauranga as a metaphor for how Māori will engage with the digital, data and technology sectors in the future. People in Waka Hourua, traditional double-hulled canoes, used this mātauranga to voyage, discover and explore the Pacific Ocean.

The framework will support Māori as they explore huge opportunities of emerging technology. It will also show rangatahi that innovating and applying STEAM knowledge to issues and opportunities follows in the footsteps of their ancestors.

Te Tari Taiwhenua the Department of Internal Affairs is developing the concept design for a mātauranga framework alongside Māori navigation experts and National Waka Hourua Governance Groups. This concept design compliments the Māori Data Governance programme for Tatauranga Aotearoa Stats NZ, which includes a Waka Hourua Framework as a metaphor for a Tiriti partnership with the Data Iwi Leaders Group.

## Te Tiriti o Waitangi / the Treaty of Waitangi

**Te Tiriti o Waitangi / The Treaty of Waitangi** is a founding document of Aotearoa New Zealand and a path to strengthening the partnership between Māori and the Crown. We must hold Te Tiriti o Waitangi / the Treaty of Waitangi and its principles central while working to support the three themes of this Strategy.

*"We have been thinking about how the Treaty might inform an approach to digital infrastructure. Thinking about article one – kāwanatanga as what we control together, Article 2 rangatiratanga as what we control ourselves, Article 3 as how we create fair outcomes." — Participant, Māori virtual hui*

Giving effect to Te Tiriti o Waitangi / the Treaty of Waitangi and its principles in the Strategy means making sure Māori have fair and equitable outcomes across the three themes. It also means making sure tāngata whenua and Te Tiriti o Waitangi / the Treaty of Waitangi partners contribute to decisions and are involved at all levels of this work, including as leaders.

## Supporting Marae digital connectivity

### CASE STUDY

### MARAE DIGITAL CAPABILITY PROGRAMME

The Marae Digital Capability Programme enables marae to receive a grant-funded broadband connection and associated hardware to support whānau and hapū to undertake economic activity and enhance their digital capabilities.

The programme, which includes \$22.4 million in government funding, is run in a partnership between Crown Infrastructure Partners, Kānoa – Regional Economic Development & Investment Unit and Te Puni Kōkiri.

The programme has already connected more than 560 marae around the country. It has also connected a further 16 community digital hubs.

#### ***Why marae connectivity is important***

Marae have been a cornerstone of Māori society for generations. They are a place where Māori customs and traditions are explored and can be challenged and debated. The marae is a wāhi tapu, a 'sacred place' which carries great cultural meaning.

The programme provides broadband connectivity, hardware to set up Wi-Fi around a marae, training and technical support, and free broadband access for five years. The hardware provided allows for video conferencing for virtual hui and online communications.

Marae digital connectivity is assisting whānau, hapū and iwi to achieve their goals and aspirations including social inclusion, cultural connections and participation in the wider community. It can also offer alternative ways to access health, social and education services.

Benefits include:

- an enhanced ability for Māori to access key services and skills necessary for improved economic participation
- alternative ways for rangatahi and whānau to learn the skills for a modern workforce
- increased productivity of local and emerging business ventures
- the ability to leverage tourism visitations for economic growth
- connecting with whānau living out of the region and overseas



*Rotorua Lakes High School students making the most of digital connectivity during the Rangatahi Business Challenge. Photo by Te Rawhitiroa Bosch.*



## Opportunities and challenges

Working towards the vision of this Strategy presents huge opportunities to pursue and challenges to address. This section outlines some of these opportunities and challenges.

### Opportunities

#### **Cementing and reflecting our place in the world**

Our culture, diversity, history, environment, and collective stories and experiences make Aotearoa New Zealand unique. These distinctive qualities are also what make us strong. We have a reputation as a reliable and principled international collaborator with low corruption and trusted political institutions.

Many New Zealanders already develop and use digital technologies in ways that reflect our unique strengths. From supporting the continued revival of te reo Māori, to creating digital recreations of our stunning landscapes that you can experience from anywhere in the world. We can build on this by developing and using digital technologies and data creatively and ethically to support our people, reflect who we are, and build our international reputation. To do this, our digital services and systems must include te ao Māori perspectives and mātauranga.

#### **Growing a sustainable, resilient, productive economy**

Digital and data-driven technologies can help our people and economy to prosper in several ways. All businesses and organisations can use digital technologies and data to improve productivity. They can also use data to innovate and solve problems. And the tech sector can develop exciting products, services and intellectual property to sell here and overseas, including, for instance, gaming and software-as-a-service innovations through to cyber security solutions that leverage our trusted reputation.

We have an opportunity to grow our digital economy and overall productivity in ways that align with our shared values and uplift the wellbeing of workers. A growing tech sector brings with it the possibility of well-paid, fulfilling jobs, but changing expectations and the ease of digital communication can lead to expectations of an "always on" work culture that negatively affects work-life balance. Many digital systems also need significant labour that is less technical. Historically, these jobs are often poorly paid or moved overseas. We can mitigate these risks by making sure we have robust rights for workers, continuing opportunities to learn and improve skills, secure infrastructure, and laws that can adapt and account for the future.

### **Helping the environment and moving to a low-emissions economy**

We can use digital technologies to move towards a low carbon future. For example, farmers can use smart agriculture tools to target where they place fertiliser and reduce runoff. Businesses can use sensors or develop digital twins to check and reduce their energy use. The weightless exports of digital services reduce the environmental costs that come with physically producing and shipping items.

However, digital technology and data systems need energy and infrastructure to run. Moving to a low carbon economy means we must make sure growth in our digital sector is sustainable. We need to find ways of dealing with e-waste, which is New Zealand's fastest growing toxic waste stream, with 80,000 tonnes produced each year. We must design digital technologies in energy-efficient ways. And we must use renewable resources to power processes that use lots of energy, like cryptocurrency transactions and data storage.

## **Challenges**

### **Technologies and their applications change quickly**

Computers are getting faster, hardware is getting cheaper, and we can transmit and store more and more data. This is driving rapid technological and social changes. Digital hardware, software, infrastructures and data of the coming decades will be significantly different to what we have today, and we will be using it in new and evolving ways.

People, organisations, and businesses must be able to help direct change, and quickly respond to changes as needed. The government must proactively develop or adjust regulation and policy to reflect changing digital technologies and their applications. Employers need to support their employees as digital transformation changes the tasks they perform in their jobs. And everyone needs access to training that develops skills they need to adapt to changing digital technology.

### **Societal inequalities can be increased and amplified**

Digital technology and data bring exciting opportunities, but they can also impact equality both positively and negatively. Using personal data to make decisions at a large scale can also lead to invasive surveillance or reinforce biases at a large scale. If people or communities cannot join in digitally, they can lose access to opportunities and services. This can contribute to cycles of exclusion from the economy and society. Digital tools and services will exclude disabled people if they are not accessible, for example.

Central government must work towards digital inclusion alongside iwi, Māori, businesses, other groups at higher risk of digital exclusion such as Pacific peoples, older, disabled and migrant communities, and organisations. Organisations must collect, store, and use data in ethical, lawful, culturally appropriate ways, following suitable rules. People who develop or publish digital content must make sure it meets accessibility and universal design standards.

### Potential for increased harms and interference

Digital technology presents issues that can significantly harm individuals, whānau, and communities. Online, content can be created and spread quickly and on a huge scale. Digital systems could be interfered with from anywhere in the world. And issues that have existed for decades have the potential to cause more harm when they move to digital environments. For example, spreading restricted content, improperly using intellectual or cultural interests, bullying, hate speech, misinformation, and disinformation.

Aotearoa New Zealand must grow its cyber security ability and resilience in line with increasing risks. Digital technologies are so widespread that interference with them could disrupt organisations and our daily lives. We need secure systems and suitable internet infrastructure.

*“Our sense of the current environment is that public trust and confidence in digital information and services is shaky... The reality is that people have cause for concern and are justified in being cautious. Breaches of confidentiality, inappropriate sharing of records by government agencies, cyber threats and scams, as well as the proliferation of misinformation online, all undermine the public's confidence in the digital world.”* – Citizens Advice Bureau submission on the Digital Strategy discussion document

To deal with these issues, we must look at the technical features of digital systems, which provide both protection from and platforms for online harm. We also need to address individual behaviour and underlying issues with society. Many digital infrastructures and services are international, which influences how New Zealand responds to issues domestically and with international partners.

Digital systems present specific issues for Māori, including for improper access, transfer, or use of Māori cultural knowledge or intellectual property. Work to progress international and domestic regulatory measures to actively protect Māori interests is underway in partnership with Māori. This work is being informed by the Waitangi Tribunal's November 2021 Wai 2522 report on international electronic commerce provisions.







## MAHI TIKA: TRUST

### Doing what's right for a world-leading digital future

#### Goals:

- *New Zealanders feel safe and empowered in online environments*
- *Organisations design and use digital technologies and data in fair, culturally appropriate, trustworthy ways*
- *Our digital and data infrastructures are fit-for-purpose and secure*

#### Key issues:

- New Zealand is viewed as a trusted global citizen with low corruption and comparatively high trust in institutions. As technology develops, our institutions and systems need to evolve in ethical, trustworthy ways.
- Trust is a key part of digital inclusion. It is critical for speeding up digital and data-driven innovation and transformation across Aotearoa New Zealand. Trust means people, communities and organisations are comfortable and confident when they are using, or subject to, digital and data-driven technologies.
- Trust is essential in digital systems:
  - People going online should be able to trust that they will not be subject to online bullying or harassment
  - People buying digital technology for their business should be able to trust that it will be reliable, secure, and meet their needs
  - People affected by decisions made using data and algorithms should be able to trust that their data was used in appropriate ways
  - Māori should be able to trust that their cultural knowledge and interests are actively protected in digital transactions.

### Key initiatives:

- **Digital Identity Services Trust Framework:** Seeking to enable provision of secure and trusted digital identity services to give people more control of their information, to support people to prove who they are online and more easily access services.
- **Algorithm Charter for Aotearoa New Zealand:** Reviewing and improving our commitment to transparency and accountability when using algorithms.
- **Māori Data Governance:** Co-designing a Māori data governance model to ensure that Māori data use is informed "by and with Māori".
- **Cyber Security Strategy 2019:** Implementing the Strategy. Priority areas are making citizens active and aware of cyber security; creating a strong and capable cyber security workforce and ecosystem; making NZ internationally active, resilient and responsive; and proactively tackling cybercrime.
- **Government Cloud adoption:** Refreshing the Government's Cloud-First policy, supporting development of onshore Cloud capability, standardising commercial structures, and helping agencies adopt the Cloud in line with Te Tiriti o Waitangi / the Treaty of Waitangi and its principles.

### Measures of success:

- The economic impacts of cyber-incidents in New Zealand are lower than in comparable nations
- All New Zealanders are able to use verified digital identity should they choose to
- All New Zealanders feel safe and supported online

2032

## What we want

We want Aotearoa New Zealand to have world-leading trusted and trustworthy digital systems that support wellbeing and cement our place as an internationally recognised, leading digital nation. As Mahi Tika — Trust is such a broad theme, we have three goals:

- New Zealanders feel safe and empowered in online environments.
- Organisations and businesses design and use digital technologies and data systems in fair, culturally appropriate, trustworthy ways.
- Our digital and data infrastructures are resilient and secure.

Most New Zealanders interact in public-facing online environments as part of their daily lives. These spaces, including social media platforms, must be safe and welcoming for everyone. The speed and scale of the digital era can increase the negative impacts of harmful content — including online bullying, hate speech, sharing objectionable content, misinformation, and disinformation. Our systems need processes to address online safety. New Zealanders also need the skills and knowledge to interact safely and thoughtfully with online platforms.

*"It is important that systems are not only trusted, but also trustworthy. While trust can be built in a number of ways that may not require a system itself to be trustworthy, for example through engaging branding and marketing, this is not our goal." — Digital Council for Aotearoa New Zealand<sup>1</sup>*

<sup>1</sup> Digital Council for Aotearoa New Zealand. 2020. [Towards Trusted and Trustworthy Automated Decision-Making in Aotearoa](#).

Not everyone has the same level of trust. For example, research shows that Māori have lower levels of trust in the public service and private sector than Pākehā.<sup>2</sup> A report on user insights from Pacific peoples found that many associated the online world with scams and questionable social media content.<sup>3</sup> Distrust in digital technologies can be historically grounded and stem from broader distrust in the systems they are part of.<sup>4</sup> Therefore, to gain or uphold public trust in digital technologies and data, the institutions that use them must themselves be trustworthy. This is particularly important when the government uses digital and data-driven technologies, because it can make significant decisions about peoples' lives and the distribution of resources.

Building trustworthy and fit-for-purpose digital systems is complex, highly skilled work. People with different specialised skills develop modern technological infrastructure, from cables to code, over many years. A new algorithm or application can have unexpected and multifaceted impacts. To ensure digital systems and services are trustworthy, the people designing them must follow appropriate technological and ethical standards. They must curate and maintain their systems and services. And they must make sure enough skilled workers are available to improve, maintain and secure systems over time.

Trustworthy digital and data systems are fair, transparent, secure and accountable. They should centre the needs of people most affected by them and honour Te Tiriti o Waitangi/the Treaty of Waitangi and its principles. Trust is important when collecting data, analysing it with artificial intelligence (AI) and other algorithms, and using it to make decisions.

We must have secure, fit-for-purpose communications infrastructure that is resistant to interference and significant outages. When outages do happen, they can impact businesses, organisations, and wider communities. For example, the 2021 ransomware attack on the Waikato District Health Board took down IT systems in five hospitals, caused payroll issues, and meant some patients needed to go elsewhere for treatment.

Many digital technologies and systems are developed internationally, which means the ability for Aotearoa New Zealand to shape and regulate these tools and platforms is limited. Along with building a trustworthy digital ecosystem of our own, the government and other organisations need to continue to build on international relationships and collaborations to help shape a trustworthy global digital ecosystem.

## Focus areas: Mahi Tika — Trust

Trust is not absolute and can change over time. We need trusted digital and data systems now and in the long-term. This will take continuing work and effort, and a proactive approach to identifying potential risks and opportunities.

We can work on three areas to build and keep trust:

- getting the right guardrails in place
- collaboratively shaping the future of digital and data-driven technologies
- adopting adaptive approaches to cyber security, online safety and infrastructure resilience.

### Getting the right guardrails in place

To have trustworthy digital technologies, we need rules and guidelines for using them ethically and appropriately. These guardrails provide certainty for people developing and using digital technologies. They also protect the rights of people affected by digital technologies.

<sup>2</sup> Te Kawa Mataaho, The Public Service Commission. 2021. [Kiwis Count Survey](#).

<sup>3</sup> [Report: Digital inclusion user insights — Pacific peoples | NZ Digital government](#)

<sup>4</sup> Te Kotahi Research Institute. 2020. [Māori perspectives on Trust and Automated Decision-Making](#). Te Kotahi are writing in the context of Māori trust in ADM but this point is relevant to other groups also.

Rules and guidelines must be coherent, comprehensive, and easy to follow so people understand how to fulfil their obligations. Some key legislation already addresses some aspects of trust, like the Privacy Act 2020 and the Harmful Digital Communications Act 2015. Legislation to create a Trust Framework for digital identity services has been introduced to Parliament. Beyond legislation, we have frameworks, guidelines and standards that address various aspects of trust.<sup>5</sup> These include the Algorithm Charter for Aotearoa New Zealand, Ngā Tikanga Paihere guidelines and the Privacy, Human Rights and Ethics framework.

Opportunities in the next few years include:

- developing a responsible and ethical approach to digital technologies, including governance and oversight to ensure trustworthy systems
- identifying and filling any gaps in existing rules and standards, including ways of protecting citizens' rights to access their personal data and understand how it is being used
- progressing the Digital Identity Services Trust Framework legislation
- making the Algorithm Charter for Aotearoa New Zealand operational across the public sector, and exploring opportunities to encourage uptake more broadly
- coordinating between public and private organisations so they can learn from each other.

#### Examples of initiatives already underway

**The Digital Identity Services Trust Framework** creates an opt-in regulatory framework for digital identity services. Digital identity is about verifying one's identity online. It is especially important when a digital service provider needs to know who a person is or confirm information about a person, like their qualifications. The Digital Identity Services Trust Framework Bill was introduced into Parliament in September 2021. At time of writing it is progressing through the legislative stages. It will help develop trusted, people-centred digital identity services.

<sup>5</sup> A selection of other rules and guidance are in **Appendix Five**.

## Fair, ethical, and transparent data use – An enduring commitment

CASE STUDY

THE ALGORITHM CHARTER FOR AOTEAROA NEW ZEALAND

The Algorithm Charter is a commitment by government agencies to manage their use of algorithms in a fair, ethical and transparent way.

Humans, rather than computers, review and decide on almost all significant decisions made by government agencies. As agencies continue to develop new algorithms, it's important to preserve appropriate human oversight and ensure that the views of key stakeholders, notably the people who will receive or participate in services, are given appropriate consideration.



Signing agencies make a public commitment to the transparent and accountable use of algorithms. These agencies agree to commit to a range of measures, including explaining how decisions are informed by algorithms; making sure data is fit for purpose by identifying and managing bias; ensuring that privacy, ethics, and human rights are safeguarded by regularly peer reviewing algorithms; embedding a Te Ao Māori perspective in the development and use of the algorithms; and clearly explaining the role of humans in decisions informed by algorithms.

### How is the Algorithm Charter benefiting New Zealand communities?

The Algorithm Charter for Aotearoa New Zealand has been a catalyst for improved practice across the New Zealand public service, and it demonstrates the government's enduring commitment to use algorithms in a fair and ethical way.

To date 27 agencies within the New Zealand public sector have signed the Charter, including most of the large operational agencies.



## Collaboratively shaping the future of digital and data-driven technologies

Digital technologies and the way they are used are evolving quickly. These changes come with ethical and cultural considerations, risks, and potential trade-offs. For example, using AI for health screening tools may improve diagnoses for some, but it may collect and use more sensitive medical information about people. Digital technologies can help preserve and enhance mātauranga Māori (such as te reo Māori language revitalisation), but it can also put mātauranga at risk. We need to decide what uses of digital technologies are appropriate and in line with our values. Aotearoa has much expertise and diverse lived experience. We will get better results if we decide how to use digital and data-driven technologies by collaborating with people who are affected by them.

Opportunities in the next few years include:

- developing guidance about data governance that respects iwi and Māori interests
- listening to communities to understand their preferences about digital technologies and data
- building our ability to co-design and co-lead approaches to developing technology
- continuing to contribute to international work such as the Christchurch Call to ensure trustworthy digital environments around the world
- advancing an AI Strategy for Aotearoa with the AI Forum.

### Examples of initiatives already underway

The Data Iwi Leaders Group and Stats NZ are co-designing a **Māori data governance model** for government data. They aim to develop an approach to data governance that reflects Māori needs and interests in data.

MBIE has worked with the AI Forum to develop cornerstones that could underpin a future **AI Strategy for Aotearoa New Zealand**. These include the aim that all AI innovation and adoption across New Zealand is done safely and ethically, with the full support and trust of New Zealanders.

## Adaptive approaches to cyber security, online safety and infrastructure resilience

A free, open and secure internet and trusted underlying infrastructure is critical for a functioning digital society. Our communications infrastructures must be fit-for-purpose and resistant to interference. Businesses and organisations need to understand what they can trust and how to improve the safety and security of their systems. We need to be able to deal with harmful uses of digital technologies, from cyber-attacks to the widespread sharing of disinformation.

Opportunities in the next few years include:

- taking a wider strategic approach to address misinformation, disinformation, and associated risks
- completing priority areas in the cyber security strategy to improve information security and national resilience
- helping individuals and small businesses understand what digital content they can trust so they can better identify phishing, fraud, scams, misinformation, and disinformation
- building suitable, future-focused, resilient communications infrastructures, including hyperscale cloud capabilities and data storage.

### Examples of initiatives already underway

The Department of the Prime Minister and Cabinet is developing a **multi-stakeholder approach to responding to misinformation and disinformation**. It is aiming to create a long-term strategy in 2022. This approach reflects that Government, civil society, tech companies, media, academia, businesses, and the public all have roles to play in responding to the issue. Those roles include building awareness of the impacts of misinformation and disinformation, calling it out when possible, and strengthening resilience to it.

The **New Zealand's Cyber Security Strategy 2019** continues to guide government-led action, in partnership with the private sector. Priority areas are making citizens active and aware of cyber security; creating a strong and capable cyber security workforce and ecosystem; making NZ internationally active, resilient and responsive; and proactively tackling cybercrime.

## Protecting New Zealand with Malware Free Networks

CASE STUDY

MALWARE FREE NETWORKS (MFN) SERVICE

New Zealand organisations need fast, actionable cyber threat intelligence to help them protect their staff and secure the services they offer to New Zealanders. The National Cyber Security Centre delivers this through its Malware Free Networks (MFN) service.

MFN is a threat disruption service that protects organisations by blocking cyber threats to their IT systems and networks in near real time. MFN complements commercial threat intelligence products by disrupting indicators of malicious activity that have been identified through the NCSC's advanced cyber defence capabilities and sourced from the NCSC's international cyber security partnerships.

The NCSC is partnering with a range of technology providers across New Zealand, to deliver the MFN service. This ranges from large telecommunications companies, managed service providers, through to boutique cyber security practices. The NCSC shares the technical details of "indicators of compromise", through its partners with subscribing organisations and does not charge partners or customers for access to the service.

### How is MFN benefiting New Zealand communities?

Since launching the service in late 2021, the NCSC has already disrupted and blocked over 50,000 cyber threats through the MFN service. In particular, the MFN service helped protect organisations from the Log4J vulnerability shortly before Christmas 2021, and is continuing to develop in scale as new partners and customers join the service.





## MAHI TAHI: INCLUSION

Making sure everyone is empowered to equitably participate in our digital society

### Goals:

- *All New Zealanders have the tools, skills and confidence to participate in an increasingly digital society*
- *Digital infrastructure, content and services meet peoples' diverse needs*

### Key issues:

- Being able to participate digitally is essential for inclusion in modern societies and economies, and provides huge opportunities to foster learning, innovation and creativity.
- Some estimates suggest up to one in five New Zealanders cannot or do not wish to engage online. Public consultation in late 2021 signalled that some communities, for example Māori, Pacific peoples, older, disabled and ethnic peoples are at higher risk of digital exclusion.
- To create a thriving, flourishing Aotearoa New Zealand, everyone will need to:
  - understand how the internet and digital technologies can help them
  - have access to affordable online connectivity and devices,
  - have access to an internet connection or mobile data, and the ability to use them confidently and safely in their day-to-day lives,
  - develop the skills and feel safe and secure to use the internet and digital technologies in ways that work for them.
- The government is the sole provider of many vital services and administrative processes that shape how people live. Digital spaces and services need to be safe, accessible, intuitive, and trustworthy.
- We must meet people's needs in a way that works for them. This means some people will get the best services from trusted community organisations, rather than directly from the government.



### Key initiatives:

- **Multi-year, Digital Inclusion Action Plan:** Delivering sustainable, longer-term options to make internet and devices affordable, improve people's core digital skills, make digital public service more inclusive and create a Digital Inclusion Lead agency.
- **Digital Skills for Seniors:** Supporting upskilling for older people as part of the Government's 'Better Later Life' Strategy.
- **Recycling government devices:** Supporting agencies to securely decommission retired laptops, for redistribution to New Zealanders needing digital inclusion support.
- **Improving rural connectivity:** Continue to invest in improving connectivity for rural and remote communities, to boost inclusion and help strengthen supply chains.
- **5G rollout programme:** Working on allocating new long-term rights to radio spectrum to effectively roll out 5G in New Zealand.

### Measures of success:

- All New Zealanders have the tools, skills and confidence to do all they want online
- High speed internet is available to all New Zealanders
- All New Zealanders can afford a quality internet connection and internet enabled device

2032

## What we want

We want an equitable, digitally inclusive Aotearoa New Zealand. The digital world is pervasive and digital inclusion can have a large impact on whether people can participate in all facets of daily life with independence, dignity and confidence. Everyone should have the motivation, access, skills, and trust to use digital tools and technologies in ways that work for them. This includes accessible digital content and services that people can use, regardless of their background and abilities. The Mahi Tika — Inclusion theme has two goals:

- All New Zealanders have the tools, skills and confidence to take part in an increasingly digital society.
- Digital infrastructure, content and services meet people's diverse needs.

One size does not fit all – what each person and whānau needs to be digitally included in their day-to-day life will vary. However, we know that everyone needs a suitable digital device, affordable internet access, and basic digital skills. We also know that many people struggle to afford devices and the internet. Knowing how to safely navigate online content and deal with scams and disinformation is important for ensuring confidence in our increasingly digital society.

*"We think it is important to prioritise the affordability of adaptive technologies for people in the disability community. The cost of these technologies can be a huge barrier preventing New Zealand from becoming a fully digitally inclusive society."* — Blind Low Vision Aotearoa submission on the Strategy discussion document

However, it is not enough for someone to have a connected digital device. For example, some websites and digital services are not accessible. In addition, people need the skills and capability to navigate the online environment, yet some vulnerable people may not have even the basic reading and comprehension skills required to engage online, especially if English is not their first language. Social media sites can be platforms for misinformation, disinformation, and anonymous threats. Businesses and organisations must ensure their digital services, spaces, and content are safe and accessible for everyone.

### Not everything needs to be digital

While this Strategy aims to pave the way for Aotearoa New Zealand to be a world-leading digital nation, that does not mean that every part of our lives needs to be digital.

Often, *kanohi ki te kanohi* (face to face) interactions will still be vital for building relationships and getting trusted information. Some people cannot or will not use digital services. We must make sure they can access services they need as well.

*"We can't look at digital inclusion outside of the other needs and requirements that influence poverty and inequity. Low income levels that affect Māori mean that Māori can't pay for connections."* — Participant, Māori virtual hui

Approaches to address digital exclusion must meet people's needs in a way that works for them. In some instances this may call for greater support for customised programmes built on specific expertise, for instance in disability. In other instances, it may mean that some people will get the best services from trusted community organisations, rather than directly from the government. For instance, with more than 80% of Pacific peoples affiliated with a church community, churches can be an important communication channel and anchor for digital inclusion initiatives.<sup>6</sup>

### The four elements of digital inclusion

Digital inclusion includes four key elements:

1. **Motivation:** people understand how the internet and digital technologies can help us connect, learn, or realise opportunities.
2. **Access:** people can afford accessible and suitable internet, digital devices and services.
3. **Skills:** people have the basic digital skills to use the internet and digital technologies in ways that work for them.
4. **Trust:** people trust the internet and online services, and can manage personal information. They can avoid scams, harmful communication, and misleading information.

## Focus areas: Mahi Tahī — Inclusion

We have significant opportunities to improve motivation, access, skills and trust.

We can speed up digital inclusion by:

- building tailored, community-centred approaches to improving digital inclusion
- ensuring digital content and services meet the needs of everyone, and
- better measuring digital inclusion and improving coordination and alignment of support.

### Tailored, community-centred approaches to improving digital inclusion

Each community and whānau may have different reasons for not taking part in society digitally. A "one-size-fits all" approach will not be effective. The government must work with trusted community partners, recognising the role they play in effectively increasing inclusion for the long term. Communities know what they need and are often best placed to deliver support. Intermediaries like libraries and non-government organisations already play an important role in improving digital inclusion.

<sup>6</sup> [Report: Digital inclusion user insights — Pacific peoples | NZ Digital government](#)

Some groups are more likely to experience digital exclusion, and we must focus on improving access for those groups. For example, the difficulty of reaching people in rural and remote areas where the population is less dense and within difficult terrain raises the cost of rural connectivity. The 2021 KPMG Agribusiness Agenda<sup>7</sup> report ranked fast, accessible rural broadband as the third highest priority behind biosecurity and quality trade agreements. Other groups most at risk of exclusion are older people, Māori, Pacific peoples, disabled people, people with children and living in low socioeconomic communities, unemployed or underemployed people, and offenders or ex-offenders. The intersection of these groups can further raise the risk of exclusion.

Opportunities in the next few years include:

- creating and continuing initiatives that meet the specific needs of communities and groups who need them most
- funding initiatives that address barriers to digital inclusion, and scaling those initiatives up or adapting them for other communities if they are successful
- having communities lead and co-design initiatives to address digital inclusion
- ensuring that all regions, including our rural and remote areas, have connectivity that meets the needs of people and businesses, now and into the future
- more effectively coordinating and aligning the government's activities to improve digital inclusion and advance an inclusive Strategy for a Digital Public Service.

### Examples of initiatives already underway

The Department of Internal Affairs invested \$10 million in **digital skills training for individuals and whānau** through the Manaiakalani Education Trust. The programme centres on young learners and their whānau to improve learning and uplift communities. The COVID-19 Response and Recovery Fund funds this work.

**The Ethnic Communities Digital Inclusion Fund** funds projects that help ethnic communities use digital technology to participate fully in society. Funded projects offer culturally specific initiatives that serve the needs of different groups. The 2021 funding round gave \$200,000 to 12 community-led initiatives.

The government has worked with private network operators to upgrade to New Zealand's telecommunications infrastructure. This will ensure that people have access to high-quality broadband at reasonable prices. The particular importance of rural connectivity is why, over the last 10 years, up to and including Budget 2022, the amount of funding the government has contributed on a per head of population basis to improving connectivity in rural areas has been more than twice that for urban areas. Significant **Government connectivity programmes** so far include:

- a. the \$1.9 billion **Ultrafast Broadband (UFB) initiative**, which now gives over 86% of the population access to fibre
- b. over \$600 million total invested across the **Rural Broadband 1 and 2 Initiatives (RBI1 and 2), Mobile Blackspot Fund (MBSF), and subsequent Rural Capacity Upgrades (RCU)**. This has improved broadband for over 372,000 rural households and businesses, provided mobile coverage for 984km of state highway and 86 tourism sites, built over 330 new towers, and upgraded nearly 70 more
- c. the **Marae Digital Connectivity** programme connecting more than 560 Marae to broadband.

New Zealand is in the top five OECD countries for providing fibre to people. Once existing programmes are completed in 2023, 99.8% of the population will have access to broadband where they live. To maintain this, we will need to keep growing our telecommunications networks and keep them fit for purpose as more people need to use them more often. Government and industry will keep focusing on giving more New Zealanders access to the connectivity they need where they live, work and study.

7 [2021 Agribusiness Agenda - KPMG New Zealand \(home.kpmg\)](https://www.kpmg.com/nz/assets/pdf/agribusiness-agenda-2021.pdf)

## Working towards 'the most digitally engaged small business sector in the world'

CASE STUDY

DIGITAL BOOST

Government has a vision for New Zealand to have the most digitally engaged small business sector in the world. Digital Boost supports small business owners to digitally transform their operating models, not only through the adoption of digital hardware and software, but through process changes, new skills, and capabilities, and having deeper insight into their business through data.

[Digital Boost Educate](#) supports small business owners, providing free, self-paced digital skills training through video modules designed for the digital starter to more advanced modules. It's a personal learning channel that covers everything from social media to adding payments to your website. Real world stories also act as in-depth video case studies for small business owners to see how others have digitally transformed their business.

The latest tool is [Digital Boost Checkable](#), a free powerful digital diagnostic tool. It performs a detailed review of a business's digital presence and provides a prioritised plan of action for what to fix and how.

### How Digital Boost is benefiting New Zealand communities

Small businesses are the heart of our communities. More resilient businesses consequently better support our communities and enable them to survive through disruption. The COVID-19 Lockdown in 2020 saw small businesses that used five or more digital apps, experience one-third less fall in revenue and 40 percent fewer job losses.

Digital Boost supports thousands of small businesses to realise the benefits of using digital tools and technologies in their business, consequently allowing them to upskill digitally and create more resilient operating models to disruption and change.

Learn more: [www.digitalboost.co.nz](http://www.digitalboost.co.nz)





*"Digital Boost has helped me, not just professionally but personally. The one thing that really drew me to it was, it was me, it looked like me. Grass roots Kiwis that have drafted a business from scratch. Since starting Digital Boost [my business] has just grown, more in the last three months than in the last three years." – Steve Ayers, Appleby Games.*

Learn more online: [www.digitalboost.business.govt.nz](http://www.digitalboost.business.govt.nz) and Checkable <https://navigator.digitalboost.co.nz/what-is-checkable>.

### Ensuring digital content and services meet the needs of everyone

We need to account for a wide range of needs and lived experiences when designing digital content and services. A key part of digital inclusion is accessibility — ensuring there are no barriers to people using digital content and services. Accessibility is especially important for disabled people, but ultimately it benefits everyone. Accessibility already has standards and long-established practices, but we need to make more effort to implement them. We must design digital services to meet the diverse needs and preferences of users, acknowledging that for some people, non-digital solutions will still be important.

Opportunities in the next few years include:

- supporting government agencies to use best practice when building and running government services, including through adopting universal design principles, New Zealand Government web standards, and the Government Digital Service Design Standard
- working with agencies and non-government advocates to help resolve digital divide issues for the groups at higher risk of digital exclusion
- highlighting to businesses and non-governmental organisations the value of providing fully accessible content and services
- ensuring people have effective, empowering, non-digital access to government services
- developing or providing tools and solutions for government agencies to deliver inclusive digital services.

#### Examples of initiatives already underway

The **Web Accessibility Guidance** project aims to build accessibility across the public sector and New Zealand web community. Its overall goal is to improve the accessibility of government online information and services. The final guidance will be published on [digital.govt.nz](http://digital.govt.nz) in 2022.

## Digital Literacy Training for Older People

CASE STUDY

OFFICE FOR SENIORS

The Office for Seniors is leading an international award-winning digital literacy training initiative to support older people to be online and carry out online transactions safely with trust and confidence.

A significant proportion of older people are digitally excluded as their internet access and use, as well as trust and confidence in using digital technology can diminish with age. The number of people aged 65 and over is increasing, and this trend will continue.

To date, six providers have signed an agreement with the Office for Seniors to form a Digital Inclusion Action Group for Older People to work collaboratively to increase the reach, impact, quality, and consistency of the digital literacy training programmes for older people.

They have been using an Essential Digital Literacy/Skills (EDS) evaluation framework to assess the effectiveness and quality of digital literacy training programmes for older people and provide a baseline level of quality digital literacy training outputs and measures. Interim evaluation results show that people who participated in the training course have gained skills and confidence to be online.

### Benefits of the training

Supporting older people to be digitally included will help enable them to live a good quality life as they age. It also helps government agencies and businesses to realise their investments in technology and online platforms and services as more people can use their services online.

Former movement therapist Claire, 70, is a participant who signed up after being gifted an iPad.

"I've learned loads," she says, "for example, I now know how to spot scams. I absolutely love taking lots of pictures of the people in my life, so it's important to know how to store them – and find them again. I've also learned about deleting images, and the difference between uploading and downloading."

Claire adds she is more adventurous and less intimidated when using technology.



## Better measuring digital inclusion, and improving coordination and alignment of support

We heard loud and clear during the engagement process that having specific, detailed and effective measurement of digital inclusion in Aotearoa New Zealand is essential.

Many organisations across the country lead initiatives that contribute to digital inclusion. We need better coordination across initiatives and between organisations – including government departments. This will help people working on digital inclusion to share their experiences and scale, repeat or adapt successful approaches where suitable.

Opportunities in this area include:

- promoting and potentially expanding existing digital inclusion initiatives that are working well
- completing development of a national digital skills framework for New Zealand
- better understanding what digital uptake and inclusion looks like for different groups, and what data we need to track improvement
- clearly understanding and measuring the full social and economic value of digital inclusion
- continuing to measure digital inclusion and ensuring we have suitable data to understand change for different groups over time
- encouraging and helping organisations involved in improving digital inclusion to share best practice
- establishing a Government Digital Inclusion Lead to help coordinate and orchestrate the government's investment and effort in improving digital inclusion.

### Examples of initiatives already underway

The Department of Internal Affairs is developing a **national digital skills framework for New Zealand**. It will provide a nationally consistent standard and include objectives for digital literacy, digital inclusion, and digital skills at different levels. Third-party providers and agencies will be able to use this framework to guide their digital skills training programmes, and help get consistent, measurable, and comparable results. The framework will also recognise that programmes need to be tailored to specific communities.



## MAHI AKE: GROWTH

### Launching New Zealand into a more prosperous digital-driven future

#### Goals:

- *Our businesses and organisations innovate and increase productivity using digital technologies and data*
- *We have a thriving, fast growing and inclusive tech sector*

#### Key issues:

- Digital and data-driven technologies offer huge opportunities to grow Aotearoa New Zealand's economy in equitable, sustainable, and world-leading ways. They offer ways to innovate and boost productivity, in all sectors of the economy, including health and other public services. They also offer opportunities for innovation, growth and jobs as a dynamic sector in their own right.
- The digital technologies sector is increasing its economic contribution, generating \$6.6 billion in export revenue in 2019 and supporting over 38,000 jobs. Access to skills is an ongoing challenge, and this demand offers opportunities to encourage more New Zealanders to enter the sector and benefit from its prospects.
- Ensuring that all New Zealand businesses and organisations are continually building their digital capability will generate positive impacts for the economy, businesses and their customers. Businesses will be more resilient and future focused. It will be important that workers are supported through this transformation, including through training and upskilling.
- Digital trade and exporting of services will help to break down traditional barriers of distance, opening up opportunities for more New Zealand businesses to sell to large global markets.
- There needs to be resilient, effective communications infrastructure and open access to data, where appropriate, for people and businesses to leverage.
- Other risks that need to be managed include offshoring of lower value jobs to workers with fewer labour protections, inadequate accounting of environmental impacts, and inequitable distribution of the financial benefits of the industry's growth.



### Key initiatives:

- **Digital Technologies Industry Transformation Plan:** A gov't/industry partnership to support the future growth of New Zealand's digital tech sector.
- **Digital Skill & Talent Plan (Part of Industry Transformation Plan):** Embed a coordinated approach to skills development and international talent hiring for the sector ensuring we have the right people now and are building the right skills and environment for a diverse future sector.
- **Digital Boost:** Continue skills training and support with the aim of reaching 90,000 small businesses by June 2023. Continue and strengthen the Digital Boost Alliance, a collaborative effort between the public and private sector organisations focused on increasing the use of digital for not only businesses, but communities and individuals. The Digital Boost programme, while a flagship initiative for Mahi Ake – Growth will also be a key enabler to both Mahi Tika and Mahi Tahī.
- **Digital Trade:** Continue to negotiate digital trade rules that make it fairer and easier for NZ businesses and consumers to participate in the global digital market. Key focus areas include the DEPA, digital chapters in trade agreements and the E-commerce negotiations at the WTO.
- **Māori-in-tech ecosystem:** advance a "by Māori, for Māori" research project to develop a shared view of the sector ecosystem to enhance visibility of activity and make connections for stronger impact.

### Measures of success:

- Digital & ICT exports are on track to becoming New Zealand's leading export earner
- All New Zealand businesses are born digital, and supported to adopt the digital tools that work for them
- The digital sector employs more than 10% of the New Zealand workforce in high value jobs

2032

## What we want

We want digital innovation to drive growth across all types of businesses and organisations in Aotearoa New Zealand. We also want the tech sector to play a key role in creating a more equitable, low-carbon future. Mahi Ake – Growth includes two goals to help us achieve inclusive, sustainable growth:

- Businesses and organisations innovating and increasing productivity using digital technologies and data.
- A thriving, fast-growing and inclusive tech sector.

To realise the potential of data and digital technologies to grow the economy and increase productivity, businesses and organisations must be digitally enabled and supported with robust communications infrastructure. Digital technologies already underpin many large corporates and other organisations in Aotearoa New Zealand, but there is an opportunity for more businesses to adopt digital tools to manage processes, increase efficiency, and market and export their goods and services, including through digital trade. When businesses and organisations across all sectors harness the power of digital and data-driven technologies, they can solve complex problems – from improving horticulture yields with robotics to using machine learning for te reo Māori speech recognition – and build innovative new products and services that serve their communities, boost exports and grow the economy.

To ensure Aotearoa New Zealand transitions to a low-carbon future that is thriving and productive, the tech sector needs support to grow with clear direction and a diverse talent pipeline. Our local talent pipeline also needs support from high-performing talent around the world. With a clear direction and dedicated plan, this sector can contribute a much larger proportion of Aotearoa New Zealand's GDP and help cement a diverse and resilient economy.

*"Immigration is essential for a high-skills industry such as Tech, however it's currently at an unsustainable level – more than 50% of new roles are filled via immigration.<sup>8</sup> Other highly skilled industries often operate at 20-25%. Industry needs to invest in domestic skills development, not just expect they can just keep buying skills in. Government needs to support initiatives and help drive change, and the Education Sector needs to support this transformation." — Digital Tech Skills and Talent Plan*

## Focus areas: Mahi Ake — Growth

To ensure digital and data-driven technologies support equitable, sustainable growth for Aotearoa New Zealand, we must encourage innovation, invest equitably, and build a diverse long-term talent pipeline. To do this, the public sector, the private sector, and communities must work together persistently with a focus on the future.

We can ensure growth by:

- building digital capability and a strong and diverse talent pipeline
- supporting Māori innovation
- supporting data-driven innovation.

### Building digital capability and a strong and diverse talent pipeline

New Zealand businesses and organisations with digital abilities and access to skilled workers are key to Aotearoa New Zealand's digital future. Many initiatives are already underway to support small businesses to adopt digital and data tools. Our innovation and tech investment ecosystems are increasingly robust.

Access to talent remains a challenge, and the COVID-19 pandemic has driven home the need to build a robust and diverse talent pipeline here in Aotearoa New Zealand. This includes creating visible and accessible career pathways for all New Zealanders, including Māori, Pacific people, women, and youth, and enabling ongoing upskilling, including for older workers whose tasks are transitioning due to changing technology.

Opportunities in the next few years include:

- continuing to support digital capability and innovation in small and medium enterprises, including through strengthening workers' general digital skills
- negotiating digital trade rules that make it fairer and easier for Aotearoa New Zealand businesses and consumers to take part in the global digital market. The rules must also honour Te Tiriti o Waitangi / the Treaty of Waitangi and its principles, and preserve our ability to respond to challenges and opportunities
- implementing the Skills and Talent Plan of the Digital Technologies Industry Transformation Plan and setting a coordinated approach to developing skills development and hiring international talent. This will ensure we have the right people now, and are building the right skills and environment for a diverse sector in the future
- leveraging Aotearoa New Zealand's trusted reputation and growing our global presence in areas such as cyber security and privacy solutions
- helping organisations make their workplaces safe and welcoming for people with a wide range of lived experience.

<sup>8</sup> This statistic was issued before the government put COVID-19 border measures in place.

## Helping establish new rules for inclusive digital trade

CASE STUDY

DIGITAL ECONOMY PARTNERSHIP AGREEMENT

Digital technology is transforming how we live and do business, but global trade rules and practices have not kept up with these changes.

New Zealand, Singapore and Chile are working together to support and advance trade in the digital era through the Digital Economy Partnership Agreement (DEPA).

DEPA will help establish new rules and practices for digital trade, and promote ongoing discussion on issues like digital inclusion, inclusive trade and support for small and medium enterprises (SMEs) in the digital economy.

The agreement covers broad areas, from strengthening trade facilitation rules like e-invoicing, e-payments and paperless trading, building consumer protection and trust, and cooperating on emerging issues like Artificial Intelligence and FinTech. The DEPA is designed to evolve as new digital opportunities and issues emerge and to act as a pathfinder for digital trade work in other international forums such as the WTO and APEC.

### Why this work matters

SMEs play a critical role in New Zealand's digital economy. In New Zealand 97% of businesses have fewer than 20 employees. SMEs face different challenges to big businesses. DEPA helps SMEs take advantage of digital trade opportunities in global markets while ensuring that there are safeguards for protecting things like personal information. The DEPA also includes opportunities for New Zealand SMEs to connect with SMEs from other DEPA parties. The DEPA also works to protect online consumer rights and interests, including protecting businesses and consumers from SPAM. The DEPA also recognises that the digital economy is rapidly evolving and that economies need to be able to maintain the right to regulate for the public interest in this area.

### What success will look like

At its core, the DEPA is designed to make trading online easier, safer and more inclusive for businesses and consumers. This means a key measure of success will be more New Zealand SMEs and consumers participating and thriving in the global digital economy. An increase in digital exports across New Zealand would also be a key indicator of success.

The DEPA is also intended to be a building block or pathfinder for other international and multilateral digital trade agreements. In this sense, success will mean the key principles and commitments in the DEPA are replicated in future trade rules and businesses face a more streamlined and predictable regulatory environment.



## Supporting Māori innovation

The Strategy is focusing on supporting Māori to use and develop digital technologies to improve wellbeing and economic development. The share of Māori working in the technology sector is slowly increasing, but we need to do more to enable more Māori to pursue rewarding careers in the digital economy. Employers need to create a welcoming work environment and support career progression.

Several Māori entrepreneurs are creating innovative tech products and services. Many Māori digital start-ups focus on environmental, social, and cultural results as well as commercial bottom lines. We can keep growing this environment by building on initiatives already underway, including the Māori Innovation Fund, the Kōkiri Start-up Accelerator and Pakihi. Māori culture has creativity, innovation and entrepreneurship set in its whakapapa. This cultural context and perspective give Māori unique ways of innovating and creating solutions that are globally relevant.

*"How do we invest in our people to lead out in these digital solutions? There are so few of us [Māori] in this sector, we have to invest in us at some stage, so our kids are the leaders moving forward". — Participant, Māori virtual hui*

A recent agreement between Ministers and the Māori Spectrum Working Group has given Māori a share of national spectrum and a role in spectrum policy making. This agreement, which sees the creation of a Māori Spectrum Commission, will support Māori to take a greater role in telecommunications, and the wider tech sector, creating cultural, social and environmental benefits.

Opportunities in the next few years include:

- using the Digital Technologies Industry Transformation Plan's research on the Māori tech ecosystem
- working with the Māori Spectrum Commission to build the skills and participation of Māori in spectrum-related industries and beyond into the wider technology sector
- continuing work in the innovation system to support Māori start-ups
- continuing to develop the Waka Hourua navigation framework to help Māori harness opportunities that emerging technology presents.

### Examples of initiatives already underway

**Pakihi** is a series of free online short courses designed to help Māori businesses move forward and flourish. Pakihi gives participants new skills, a growth plan, access to other support, and networking with other Māori businesses. The MBIE Māori Economic Development Unit is funding the initiative and Te Wānanga o Aotearoa is delivering it. Pakihi participants are Māori business owners, their employees, or Māori wanting to engage in small business. The courses are being delivered again in 2022.

## Supporting data-driven innovation

Data supports innovation. Using and analysing data can make services better match customer needs, reduce waste, and improve our understanding. Many local companies are already creating data-driven products and services, but we can support even more uptake. The Digital Technology Industry Transformation Plan has included a focus on data-driven innovation and canvasses some of the issues and potential actions that will ensure data drives innovation in a way that upholds privacy, supports Māori data governance, and builds trust. This focus links to the *Mahi Tika* – Trust theme, specifically the goal that organisations design and use digital technologies and data in trustworthy, transparent ways.

Opportunities in the next few years include:

- raising awareness of the value of data-driven and next generation technologies, including AI, 5G and the Internet of Things
- making more data available for people to innovate with, for example spatial data to support smart cities and agritech, and expanding our ability to pool and share data
- advancing an AI Strategy for Aotearoa
- progress Future Pathways, which is exploring how to create a connected, adaptable, and resilient science system, and includes potential design principles for research infrastructure
- publishing more government open data
- developing better tools and metrics for measuring the digital economy.

### Examples of initiatives already underway

Stats NZ is leading work to **understand the barriers to making data easy to compare and use across different systems**. For data to be most effective and useful, it must be in structured and standardised formats to support compatibility, traceability, and effective reuse. New Zealand adopted the Open Data Charter in 2017, reinforcing its commitment to open data. Adopting the charter gave government agencies principles and actions to release open government data faster.

## Testing the boundaries on what digital hospitals can deliver

CASE STUDY

NEW DUNEDIN HOSPITAL

*Dunedin's new hospital is on track for completion by 2028. When complete the \$1.4 billion state-of-the-art hospital is envisaged to be a leader in digital health solutions.*

The hospital is being built in two stages. An outpatient building is due to be opened by 2025 and an inpatient building by 2028.

Programme Director, New Dunedin Hospital Tony Lloyd says the new hospital will be similar in size to the current hospital but its design and vision to use the latest technology will make it New Zealand's first digital hospital with a strong focus on digital solutions to replace the existing paper-based and digital interactions that occur with patients.

"Efficiency benefits will include improved patient flow around the hospital and better access to diagnostics and treatment spaces, reducing delays. But ultimately, we want this to be a place where people feel welcomed and cared for," Lloyd says.

"The design also includes technology and processes to improve efficiency, enhance patient and staff experience and increase pandemic readiness which will benefit people across the Southern region. Ensuring the security of the digital and data management systems will also be a top priority."

"Starting the new hospital build from the ground up means we can leverage off major advances in hospital care occurring internationally, particularly in places like the USA and Korea. We also want to use our own local talent, such as the CODE hub here in Dunedin, to work alongside us and really test the boundaries of what the digital hospitals can deliver," Lloyd says.

### Using digital twin technology

One of the options under consideration for the new hospital is the introduction of digital twin technology. This would show the origin, composition, and likely replacement date of each item used in both constructing and running the hospital, mapping thousands of items digitally.

In state-of-the-art construction it's common to know details about every item of build infrastructure, every beam, door handle, window etc., to replace materials before obsolescence (e.g. replace windowsills before they start rotting and leaking).

Lloyd says the NDH teams want to go further and extend the use of digital twin technology to include items used to run the hospital. This would include knowing the location, maintenance, and replacement details of heart monitors, surgeons' scalpels, ventilators, and more. Even replacing the bulbs in theatre lamps before they blow out, meaning precious theatre hours are not lost. Most of a hospital's costs are in maintenance, he says, with a common rule of thumb being that for every \$1 million spent on design, \$10 million will be spent on the build and around a further \$100 million on hospital operation and maintenance over a life of 40-50 years.



*A visual of the new Dunedin Hospital Outpatients Building near the former Cadbury factory site in the central city*

Using digital twin technology increases efficiency and enables significant cost savings over time, even when factoring in the upfront cost of purchase and installation.

This is an important consideration given that the new hospital will include 421 beds, 16 theatres (expandable to 21 theatres) and 30 ICU or high dependency beds (expandable to 40) with the outpatient building also supporting greater delivery of ambulatory care.

### Games for health

The programme team are also working closely with [CODE](#), a Dunedin-based hub designed to progress the expansion of New Zealand's growing video game development industry.

[Games for health](#) have the potential to improve health outcomes through promoting healthy living, disease prevention and diagnosis, treatment and rehabilitation and through the education, training and professional development of service providers.



One project that has received funding through Games for Health (co-developed by CODE and Enterprise Dunedin) recently is a video game called [Nutri-Islands](#) which has been designed to increase children's nutrition knowledge.

Game designer and nutritionist Claudia Leong, PhD, says research has shown that both children and parents believe that video games can offer an avenue to increase nutrition knowledge. However, negative views such as screen time usage would need to be addressed before widespread adoption. The initial research has provided information about game mechanics that will inspire the game design and enhance engagement of video games for nutrition education.

Digital gaming tools such as this may well become integrated into how preventative care and digital hospitals are designed in the future.

### What will this mean for patients and staff

"We want the technology underpinning the new hospital to enable timely and quality patient care. Patients will have greater access to information and will receive more services in the home and in the community," Lloyd says. "And with staff having role-based access to medical information, the patient experience will have greater continuity and be more personalised."

"We want the new hospital to make it easier for hospital staff to be even more patient-centric than they are now. This will involve better booking management systems, records management (including patients contributing to their own health records), being able to navigate hospitals better, wearable devices that enable both improved tracking of patient health and earlier departures (because hospital continues monitoring patients at home)."

The new solutions will extend beyond the hospital walls, connecting the DHB's rural hospitals and satellite services.

"The Southern DHB is lining up its project plans with WellSouth and the other DHBs in a collaborative process that will benefit the South Island," Lloyd says. "We're also sharing what we're learning nationally, so our entire healthcare system can gain from the work we're doing."

The vision is for New Dunedin Hospital to become a blueprint for five more New Zealand hospital builds now in the pipeline. Some of the technology envisaged could also be of interest to other industries such as New Zealand airports, he adds.

## Better data, better access, better health and wellbeing

CASE STUDY

HIRA

New Zealand is preparing for a new health system that recognises the value of high quality data in enabling high quality care – and Hira is the gamechanger that makes this a reality.

Across New Zealand, whānau and communities, the health and disability sector and digital health industry are working together to bring Hira to life.



### **By everyone, for everyone**

Hira is a digital capability enabling health information to be available to all New Zealanders wherever and whenever they need it. It recognises that everyone is unique –with different preferences, abilities and means when it comes to accessing and consuming information. It also recognises health information is held across multiple systems, presented in different styles and formats, and used for different purposes.

In New Zealand, some people also experience health outcomes that are unfair and avoidable. Improving outcomes for tangata whenua is critical to Hira. Together with iwi, rangatahi, whānau and community groups a Health New Zealand team is building networks, setting priorities and exploring new ways for Hira to support hauora and enable mana motuhake and tino rangatiratanga.

### **Information is taonga**

Hira will ensure information is accessible in ways that work for everyone. Working smarter with health information and interacting with services will mean greater choice in health care, and better community outcomes.

To achieve this, ensuring whānau and communities are at the heart of Hira is crucial to its features and functionality. Delivering Hira is a huge community effort requiring strong partnerships and collaboration.

### **Making it work**

Similar to online banking, Hira pulls data from different systems into one place to create a single view using application programming interfaces (APIs). APIs allow the information to look like one record but it comes from lots of sources. They also allow existing systems such as patient and provider portals and electronic health records to be populated with information from multiple other sources.

In time, New Zealanders will be able to access and control their health information through their smartphone, tablet or computer. There will also be other accessible options for people who don't have access to technology or prefer not to use it.



### **Making it meaningful**

Delivering a capability that will transform New Zealand's health and disability sector is a complex job and understanding the challenges and needs that a solution like Hira could address is the first step. Co-design conversations are inspiring the reimagining of what technology could do for health care, not what it should or already does, and ensuring Hira will be meaningful for those who use technology and those who don't.

### **Where ambition meets innovation**

Fuelled with insights and ideas, and driven to create purposeful technology and integrated solutions, vendors are helping to bridge the gap between better use of data and building a smarter health care system.

Activating a new health care system in New Zealand will take time. Hira will initially provide the ability to access and interact with basic information like:

- Personal details.
- COVID-19 vaccinations and test results.
- Prescribed and dispensed medicines.
- Health and wellbeing entitlements.

### **Benefits for every New Zealander**

- Having their latest health information in one view makes it more accessible and shareable and means fairer access to health services.
- Health professionals will be better supported to make care decisions with access to a single virtual record, where and when they need it.
- Digital health professionals will have even more innovation opportunities.

Up to \$170 million was approved for Hira to 2025 from the \$400 million Budget 2021 package for health and disability sector digital infrastructure and capability. Delivered in three stages, each will deliver new services and functionality.

## Spotlight on skills and education

For digital Aotearoa to flourish now and into the future, people need skills, knowledge and capabilities. What each person needs will vary, depending on their goals and stage of life. To deliver skills development, training and education, we need a broad range of suitable and people-focused programmes and work-based opportunities. Skills development, training and education are essential to all three of the Strategy's themes.

The Digital Skills and Talent Plan is a key development that sets the path for scaling up and transforming the skills, training and education pathways we need for a flourishing digital tech industry. The Plan was developed by industry with wide consultation and research. A Steering Group oversaw the Plan's development, with members from the industry, government, universities and civil society. The Plan includes principles and specific actions, including a strong focus on reskilling and taking an all-of-government approach to skills. Initiatives in the Plan will be progressed as part of the skills workstream of the Digital Technologies Industry Transformation Plan. MBIE and government agencies are working alongside industry to develop a targeted approach to implement the Plan over the short and medium term. Implementation will require some significant shifts in approach, with a related commitment to action, and will also be based on current transformational system-wide changes e.g. the reform of vocational education.

More widely, we will need to focus on and invest in skills development, training and education as we work towards our goals. A robust, fair approach to lifelong learning includes:

- Digital learning as part of the national curriculum for young people that helps them succeed in science, technology, engineering, mathematics, creative subjects and beyond. Digital technology should be integrated into learning across the curriculum and support youth to become digital leaders.
- Training, mentorship and professional development for workers at any stage of their career. Specifically, workers need to learn and develop the "soft skills" to build and run complex and people-centred digital systems, businesses, and infrastructure. These soft skills include relationship building, creative thinking, clear communication, and conflict resolution.
- Developing children and young people's critical thinking and digital literacy through early learning and schooling, alongside public education initiatives to grow digital media literacy in the community. This will ensure people can identify misleading content, while recognising the systemic causes that need broader solutions.
- Vocational training and work-based placement with businesses and industries to develop early-career tech workers. This will help grow the pool of skilled tech workers in Aotearoa New Zealand. It will also ensure that underrepresented groups like Māori, women, and disabled people get support and mentoring in tech careers.
- Career and professional development for the existing tech sector workforce, to retain and grow their skills, and to maximise their ability to mentor and coach early-career tech workers and move them on through the skills pipeline.
- Access to lifelong learning to help people in all stages of life adapt to changing technology. This can range from helping people use home appliances that connect to the internet, to upskilling workers so they can thrive as jobs incorporate new technology.

*"What pathways do our rangatahi have into learning digital technologies? What are the barriers for them getting into learning? We need to provide a new way of learning for Māori in the technology space. My aspiration is for rangatahi to come into [the tech] space through a Māori pathway." — Participant, Māori virtual hui*

## Putting the Strategy into action

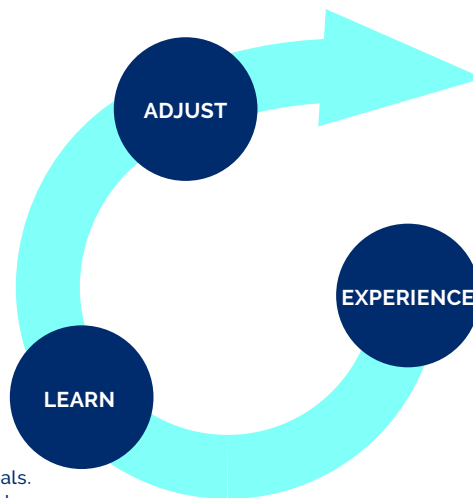
The Digital Strategy for Aotearoa is supported by the Action Plan that sets out the initiatives which support the vision and goals. This first Action Plan will be refreshed every 12–18 months to ensure it is still fit-for-purpose given emerging trends and priorities. We expect that new funding and capacity will be required over coming years to support the aspirations and goals of this Strategy.

### Our approach for implementation: experience, learn, adjust

We will take an iterative approach to implementing the Digital Strategy for Aotearoa by using a model of “experience, learn, adjust”. This is a dynamic process which encourages exploration and innovation and will ensure we stay on track to reach the vision and goals of the Strategy in the context of rapid technological and societal change. Not all initiatives, measures, or ways of working that are needed to realise the vision and goals of this Strategy will be in place straight away, and this model gives us an opportunity to revisit and revise our approach into the future. We expect that every 12–18 months, we will go through the cycle below.

Decisions are made about whether projects need to be added, changed or decommissioned in order to reach the vision or goals.

Projects are reported on, and a measurement framework is in place, to track progress against vision and goals. The wider community has input on progress, and whether we are broadly on track.



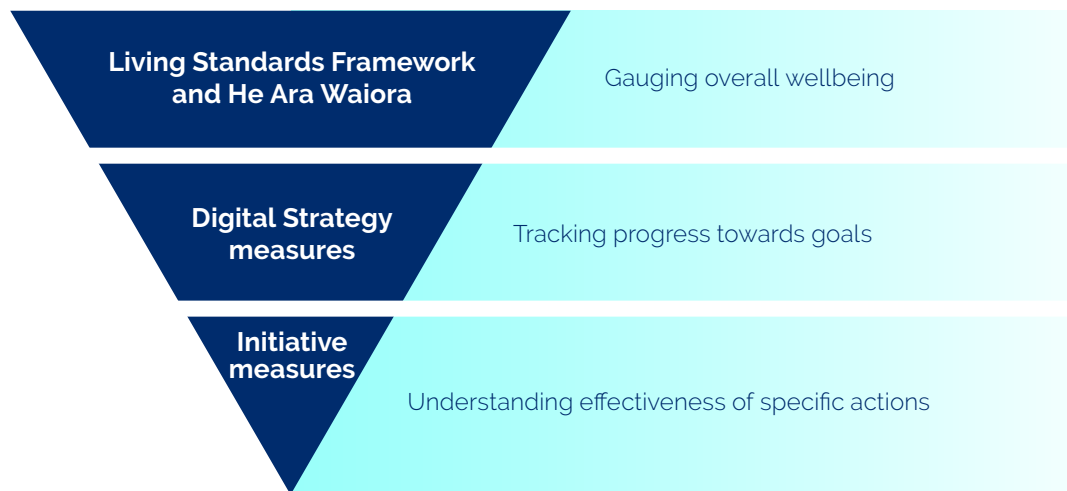
Work led, co-led or commissioned by government is undertaken that contributes to the vision, themes and goals in collaboration with others.

## Measuring success

To understand how Aotearoa New Zealand is progressing towards the vision and goals of this Strategy, we need a clear picture of what success looks like and the steps towards getting there.

The image below shows three levels of indicators and frameworks that will help us understand progress and align future work towards the goals and vision of the Strategy. This framework will help grow public understanding of progress and inform ministerial and agency decision-making about planning, priorities and Budget bids.

### How we will know we are on the right track



## Working together

While the Strategy primarily focuses on work led, co-led or commissioned by the government, we will not reach the future vision for a digital Aotearoa without the work of many individuals, people, communities, iwi, hāpu, businesses, non-governmental organisations and government agencies.

Much of this work will need to be collaborative. You will see this reflected throughout the Strategy — for example in the co-design of a Māori data governance model with the Data Iwi Leaders Group; MBIE partnering with NZ Tech and other tech sector representatives on the Digital Technologies Industry Transformation Plan; the international Christchurch Call to address violent extremism online; or digital skills training being led by community providers. The government will also need to continue to solicit robust independent advice and will continue to learn from the Digital Council of Aotearoa New Zealand, the Digital Boost Alliance and other people with expertise and lived experience throughout this journey.

## Oversight and direction-setting

The initiatives that contribute to the Digital Strategy for Aotearoa will be led, co-led or funded by different government agencies across a range of portfolios, with lines of responsibility to Chief Executives and Ministers. It will be important that these efforts are joined up to ensure progress towards the vision and goals in this Strategy. There will also be the need for coordination across the different initiatives and agencies that support the Strategy.

There will be three levels of engagement and oversight to support the Digital Strategy:

- **Ministerial:** provided by the Digital Ministers Group
- **Departmental:** provided by a cross-agency leadership group
- **Multi-stakeholder forum:** including community, business, civil society, and with Māori as Tiriti/Treaty partners.

Further work is underway to develop how these three aspects will work in practice.





# Appendices

## Appendix One: The scope of this Strategy

This is a national Strategy which covers work led or commissioned by the government, including work done in partnership with others. The focus is on getting the right pieces in place, so organisations, businesses and communities can flourish, and everyone is better supported to contribute to, and thrive in, the digital era. This will include using the range of levers and tools available to the Government and public sector such as infrastructure provision, procurement, policy development, regulation, measurement and service delivery.

The Strategy also covers how digital technologies and data can contribute to Aotearoa New Zealand's digital future but does not focus on the development or implementation of specific technologies, for example the Internet of Things or blockchain. Harms that are enabled by widespread digital adoption, such as the dissemination of mis- and disinformation, are in scope.

The Strategy does not generally cover how individual government agencies use digital technologies and data to help them deliver their operational objectives, for example in health or transport, or the overall process of digital transformation within public sector agencies. There are a range of other government strategies that support and have dependences with the Digital Strategy for Aotearoa. These are outlined in Appendix Four.

### **What do we mean by digital?**

When we talk about "digital" in this Strategy, we are talking about computer hardware and software, the infrastructure that supports it, and the data that is so integral to these systems. The Strategy also talks about rules and policies governing digital technologies and their applications, and the wider socio-technical systems that digital sits within. This means we are not just focusing on the digital technologies themselves but also how they are designed and implemented and who gets a say, the data that feeds in and is created, the many ways they are used, and the resulting social, financial, environmental and cultural impacts.

## Appendix Two: Members of the Digital Ministers Group

The purpose of the Digital Ministers' Group will be to support the development of a Digital Strategy for Aotearoa and its implementation. Members and the portfolios they represent in this group are:

- Hon Dr David Clark, Minister for the Digital Economy and Communications and Minister of Statistics (Chair)
- Hon Stuart Nash, Minister for Economic and Regional Development and Minister for Small Business
- Hon Grant Robertson, Minister of Finance and Minister for Infrastructure
- Hon Meka Whaitiri, Associate Minister of Statistics.

A wider set of Ministers have also been welcomed to participate in this Group, including Foreign Affairs; Research, Science and Innovation; Education; Public Service; Justice; Māori Crown Relations; Associate Education; Trade and Export Growth; the Minister responsible for the GCSB and NZSIS; the Minister for Seniors; and the Minister of Internal Affairs. These Ministers will be welcome to contribute for particular topics of direct relevance to their portfolios.

This Group reflects the fact that activity relating to the Strategy sits across a number of different portfolios:

Portfolio Ministers	Supporting agencies
Minister for the Digital Economy and Communications	MBIE, DIA, DPMC, Stats
Minister for Small Business	MBIE
Minister for Economic and Regional Development	MBIE
Minister of Internal Affairs	DIA
Minister of Statistics	StatsNZ
Minister for Research, Science and Innovation	MBIE, Callaghan Innovation
Minister Responsible for GCSB and SIS	GCSB, SIS
Ministers responsible for central agencies including the Prime Minister, Minister of State Services and Minister of Finance	DPMC, PSC and Treasury
Other delivery and enforcement ministerial portfolios including: <ul style="list-style-type: none"> <li>- Minister for Trade and Export Growth</li> <li>- Minister of Justice</li> <li>- Minister of Police</li> <li>- Minister of Education</li> <li>- Minister of Health</li> <li>- Minister of Inland Revenue</li> <li>- Minister for Social Development and Employment</li> <li>- Minister of Transport</li> <li>- Minister for Seniors</li> <li>- Minister for Culture and Heritage</li> </ul>	NZTE, Justice, Police, Education, Health, Social Development, Inland Revenue, Waka Kotahi, NZTE, Office for Seniors, Ministry of Culture and Heritage

## Appendix Three: Reflecting the views of New Zealanders in the Digital Strategy

It is important that the Strategy takes into account the aspirations of people, businesses, organisations and communities across Aotearoa New Zealand. In October 2021, we published the discussion document "Te keko ki tētahi Rautaki mō Aotearoa Towards a Digital Strategy for Aotearoa" for public engagement.

The engagement process included:

- 4 general virtual hui
- 2 virtual hui with close to 100 iwi leaders and Māori innovators engaged with kaupapa Māori and digital technology
- 2 virtual hui with members of the disabled community, focused on digital accessibility
- 1 virtual hui focused on youth, and
- 1 virtual hui with members of Pacific communities.

Over 320 members of the public attended the 10 virtual events. We also received written submissions from many individuals and organisations, and ideas submitted via our online collaboration tool.

The ideas and recommendations shared in these submissions and hui have guided the development of the Strategy. A full summary of submissions has been published on the digital.govt.nz website.

People made many specific and detailed suggestions about potential initiatives that could support the vision and goals of this Strategy. These suggestions will help to inform work going forward. The Digital Strategy has been prepared during a period where the complex issues raised by our digital opportunities and challenges are being actively considered through multiple government and non-government fora and initiatives. For example, the Waitangi Tribunal issued a Wai 2522 report in late 2021 into the intersection between mātauranga Māori, the digital world, and international trade rules regarding e-commerce. The Digital Strategy was substantively developed by that time however many of the concepts assessed in that report have also been considered in parallel through the development and engagement process for the Strategy. The guidance provided by the Tribunal will also inform future Strategy and implementation measures.

Thank you to everyone who provided input throughout the engagement process.

## Appendix Four: The support of other strategies

The Digital Strategy for Aotearoa is an overarching strategy, supported by specific strategies and work programmes for particular aspects of work. These include:

- [The Government Data Strategy and Roadmap](#), Stats NZ, 2021
- [The Digital Technologies Industry Transformation Plan](#), MBIE and NZ Tech, in development
- [New Zealand's Cyber Security Strategy 2019](#), Department of the Prime Minister and Cabinet, 2019
- [Strategy for a Digital Public Service Rautaki mō tētahi Rāngai Kāwanatanga Matihiko](#), DIA, 2020
- Education Digital and Data Strategy, oversight provided by the Education Sector Stewardship Forum, in development
- [The Digital Inclusion Blueprint Te Mahere mō te Whakaurunga Matihiko](#), DIA, 2019
- [Better Later Life Action Plan | Te Tari Kaumātua](#), Office for Seniors 2021.

Coordination mechanisms across government will ensure these and future cross-agency digital and data initiatives keep at their core the Strategy's vision of a flourishing and prosperous Aotearoa in the digital era.



## Appendix Five: Understanding our digital landscape

As outlined earlier in the Strategy, when we talk about “digital” in this Strategy, we are talking about a varied ecosystem which includes:

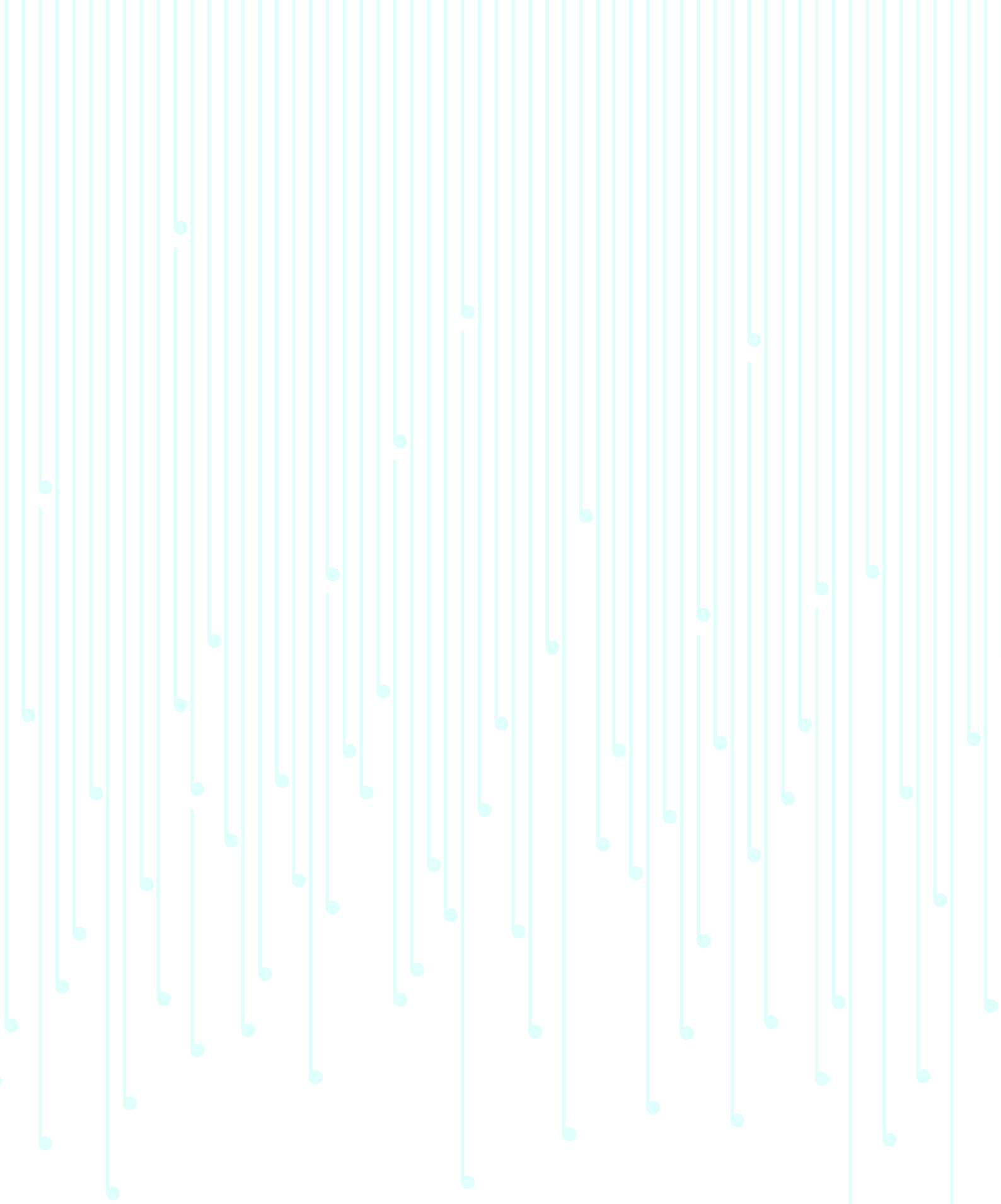
- computer hardware and software
- infrastructure and data
- applications and uses of hardware, software and data
- rules and policies governing digital technologies and their applications, and
- the wider socio-economic systems that digital technologies sit within.

We expect these aspects of the digital landscape will stay the same over time, but how they look in practice will change. The table below shows the different aspects and some current examples for each. This is not a full list but aims to give an indication of the depth and breadth of what “digital” looks like at the time of writing.

### *A snapshot of our current digital landscape*

Aspect	Description	Current examples
<b>Hardware</b>	The physical things	Desktop computers, laptops, smartphones, robots, virtual reality headsets, sensors, routers, drones, smart speakers, internet-enabled appliances.
<b>Software</b>	The computer code	Rules-based and machine learning/AI algorithms and models, application programming interfaces (APIs), websites, games, apps.
<b>Infrastructure and inputs</b>	The wiring behind the wall	The internet itself, the world wide web, network layer security and internet protocol security, web standards and protocols, data sets, cables, satellites, data centres.
<b>Applications and uses</b>	What you can build using hardware and software	Social media platforms, smart cities, digital twins, the internet of things (IoT), participatory democracy tools/platforms, sharing economy services, crowdfunding services, service delivery, productivity management, sector reform (tax, health, education, transport), cryptocurrency, digital identity, FinTech/ AgriTech etc.

Aspect	Description	Current examples
<b>Rules and policies</b>	How we are allowed and encouraged to use digital technologies and data. This includes legislation, international agreements, standards and best practice guidelines, all of which require compliance with Te Tiriti o Waitangi / the Treaty of Waitangi and its principles.	<p><b>Use of data:</b></p> <ul style="list-style-type: none"> <li>Privacy Act 2020</li> <li>The Algorithm Charter for Aotearoa New Zealand</li> <li>Te Mana Raraunga Māori Data Sovereignty Principles</li> <li>Ngā Tikanga Paihere (Stats NZ)</li> </ul> <p><b>How to build/design technologies:</b></p> <ul style="list-style-type: none"> <li>Web accessibility standard</li> <li>Government Digital Design Standard</li> <li>ISO Standards</li> <li>Traditional Knowledge Label Framework</li> </ul> <p><b>International agreements and fora:</b></p> <ul style="list-style-type: none"> <li>The Christchurch Call</li> <li>Open Government Partnership</li> <li>Digital Nations Charter</li> <li>International trade agreements</li> <li>OECD Principles and Recommendations</li> </ul> <p><b>Protecting from harm:</b></p> <ul style="list-style-type: none"> <li>Security standards</li> <li>Harmful Digital Communications Act 2015</li> </ul>
<b>The wider system</b>	How and where digital technologies are embedded	Who gets to design digital services and products, what is the experience like for the user, who is excluded from participating, how data is collected, used and stored, how does organisational culture affect the design and implementation of digital technologies, who makes decisions based on algorithmic outputs.



**Te Kāwanatanga o Aotearoa**  
New Zealand Government