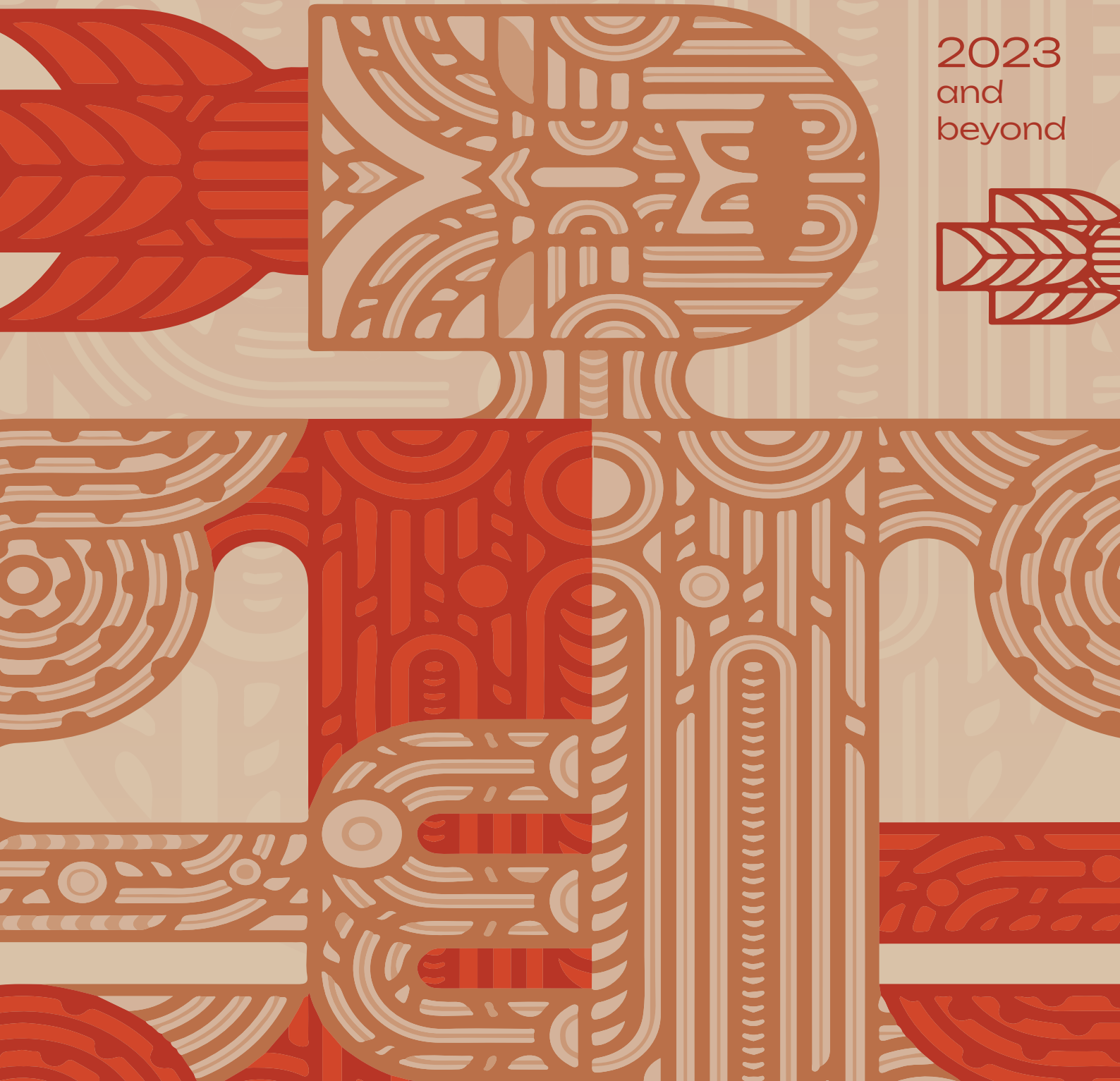


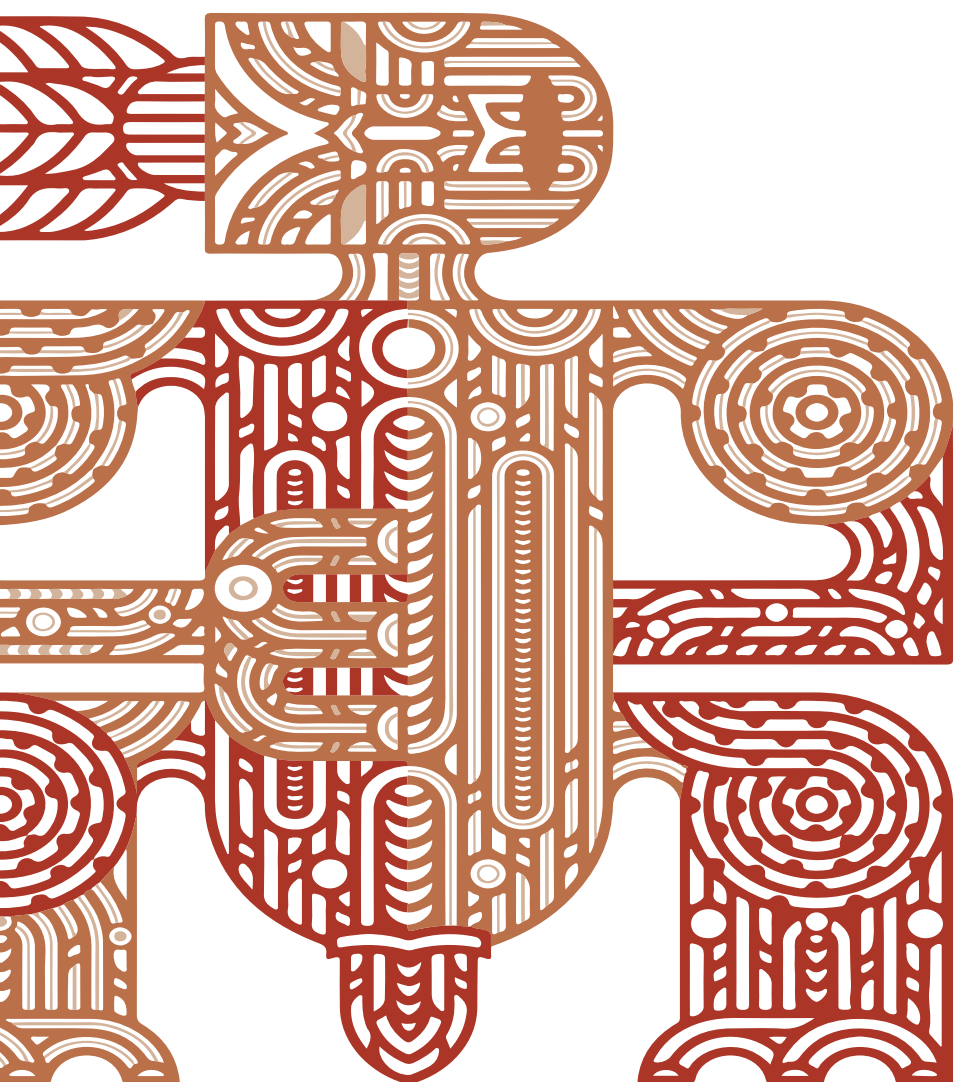
Mapping
the **Māori**
Tech Sector

2023
and
beyond



Kia whakatōmuri
te haere whakamua

I walk backwards into the future
with my eyes fixed on my past



Foreword

Tēnā koutou katoa i roto i ngā tini āhuatanga o te wā.

Ko te amorangi ki mua, ko te hāpai ō ki muri.

Anei rā te kupu whakataki e hāngai pū ana ki ngā rākau a te Pākehā i whakataukitia e Tā Apirana Ngata.

Hoki mai ki te kupu oha a te pou mataaho o Te Whare Wānanga o Awanuiārangi ki Tā Hirini Moko Mead e kī ana, “Rukuhia te mātauranga ki tōna hōhonutanga me tōna whānuitanga.”

Nō reira, nanaohia ngā rākau hangarau o te ao hou hei ara whakapiki, ara whakakake i te mātauranga Māori, mātauranga hou e tipu kaha ai tātou mai tētahi whakareanga ki tētahi whakareanga, haere ake!

With the outbreak of Covid-19 in recent years, Māoridom were exposed to a new way of education and online learning.

From circumnavigating the Pacific Ocean, Māori are well accustomed to exploring, adapting and flourishing in a new environment. The role of Māori Tech is now part of the mixed-mode delivery of Mātauranga Māori, tikanga Māori and te reo Māori within Te Whare Wānanga o Awanuiārangi learning spaces. Māori Tech is now a key cog in terms of communication and networking between hāpori (community), tauira (learner) and kaiako (educator) from across the motu and abroad. Māori Tech is now a normality in day-to-day activities and operations in the wānanga space, online learning, lectures, analysis, karakia, waiata and kōrero are widely accepted and adhered to.

Since its inception, Te Whare Wānanga o Awanuiārangi have been leaders in the delivery and application of mātauranga Māori, āhuatanga Māori, kaupapa Māori, te reo Māori and tikanga Māori for Māori and non-Māori at local, regional, national and international level. Māori Tech, online learning now allows Māori to engage at a global scale with iwi and our stakeholders through our culture, our language and our worldview. This is encapsulated and reflected in the key recommendations from this report Mapping the Māori Tech Sector 2023 and Beyond (Prepared by Dr John Clayton, Hinerangi Eruera, Dr Karaitiana Taiuru and Kaye-Maree Dunn).

Furthermore, the potential for emergent tech for Māoridom is an opportunity for our team to design and implement a Treaty and Māori Development Strategy within the wānanga environment for meaningful outcomes for Māori and indigenous communities from Aotearoa and the world.

Nāku iti,



Associate Professor

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Report developed with support from the Ministry of Business, Innovation and Employment,
Te Whare Wānanga o Awanuiārangī, NZTech and Making Everything Achievable Ltd.



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INTRODUCTION

He tākoha - mō koutou - mā mātou - mō ngā uri whakahaheke.

A gift for you, by us, for our future generations.

This report is dedicated to our whānau, hapū, marae and Iwi communities.

It aims to build on the foundations set by many lone indigenous voices, activists, researchers, teachers, Māori tech nerds and engineers who have worked tirelessly to normalise tangata whenua working, building and thriving using technology as a tool for our advancement. It is important that as a result of this report our people get to see, hear and feel ourselves not only as token add-ons but intentionally sought-after partners, co-designers and contributors to the NZ Technology sector.

Our rangahau (research) and investigation was undertaken to increase our understanding of the current capabilities within the Māori tech sector and provide an indication of how engagement, capability and capacity could be strengthened to support our impact within Aotearoa and around the world.

As the research matured, the current frustrations, needs, roadblocks, and aspirations of Māori entrepreneurs, innovators, and leaders within the tech sector became very clear. There is still significant work to do.

Our hope is that the voices and stories shared here will contribute to our Government's understanding of the well-being and current vibrancy of the sector. We also aim to provide guidance on how Māori can be supported to build upon their potential to support each other and continue to contribute to our country's broader economic growth alongside our environmental and social responsibilities.

This report will seek to explore what Māori Technology looks like in 2023 and work to understand how Māori practitioners, workers and business owners are applying Mātauranga Māori in their practice and what impact that has on what they produce or experience whilst learning and working in Aotearoa and Te Waipounamu.

The world continues to evolve with new and emergent technologies. The pace of development is operating at light speed, technology and data are increasingly becoming weaponized whilst the calls from indigenous nations for Governments and Corporate entities to operate as responsible stewards continue to fall on deaf ears.

As the demand for more skilled workers increases, there are still significant digital disparities that exist between Māori and non-Māori, including equitable access to reliable and affordable internet and telecommunication services, access to digital devices and pathways into high quality and relevant Science, Technology, Engineering, Art and Mathematics education for whānau, children and young people within Kōhanga Reo, Early Childhood centres through to Māori immersion, Whare Kura, Kura Kaupapa, Kura ā Iwi and mainstream schools. These disparities are no longer acceptable!

With this work, we are adding another layer to research already conducted in this space by Māori academics and researchers report including the Toihangarau report¹ developed by Robyn Kamira and the Paua Interface Team which provides valuable Māori tech sector insights and the Te Au Hangarau report² helps us to understand what factors influence Māori tech graduates' success

1 <https://www.toihangarau.nz/>

2 <https://industry.aucklandnz.com/techakl/research>

and participation in Aotearoa. Many thanks to the visionaries who brought these pieces of mahi to life as they helped set a wider context of the broader issues affecting technology growth potential amongst Iwi/Māori communities. We also acknowledge that considering our current climate, Technology is still considered a luxury whilst more pressing challenges whānau, hapū and iwi are responding to, sit across Housing, Food and Water Security, Treaty Claims/Negotiations Cyclone responses, Local and Central Government activity and a myriad of health, economic and other social needs. Being in a position to forecast and focus on building capability in technology and data with full hands we know is a big ask and a privilege. Our loving wero (challenge) to our leadership is we still need to keep an eye on the horizon and remain ever mindful of the potential and risks Technology can offer our communities.

Our hope is this research will highlight some of the major issues we are facing and provide guidance for our Iwi leaders, the Government, and the broader Tech Sector on what can be done to ensure no one is left behind.

Ki te Kawanatanga, Tēnā, āta whakarongo ki ngā tohu, mai i era e tino mōhio ana³ -
To the Government, Listen carefully to our voices.

Nā mātou ngā Kaihapai

Making Everything Achievable

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Graeme Muller, Belinda Allen, Duane Grace

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Guest Editor

Dr Karaitiana Taiuru

As Kaihāpai we acknowledge our Taumata Rangahau and Kaikawe Kōrero

Taumata Rangahau

Tama Kirikiri, Graeme Everton, Barry Soutar, Dan Walker, Lee Timutimu, Amber Taylor, Riki Manarangi, Potaua Biasiny-Tule, Antony Royal, Megan Tapsell, Raukura Hoerara-Smith, Hinerangi Eruera Murphy, Hemi Ruka, Simon Walker, Dr Karaitiana Taiuru, Nikora Ngaropo, Dr Acushla Deeann Sciascia, Shanon O'Connor

Kaikawe Kōrero

Rangahau Interviewees: Dr Warren Williams, Amber Taylor, Aaron McDonald, Dr Karaitiana Taiuru, Barry Soutar, Lee Timutimu, Dan Walker, Hori Mataki, Belinda Allen, Te Tau Hou Nohotima, Nikora Ngaropo, Antony Royal, Naomi Manu, Maui Hudson, Megan Tapsell, Petera Hudson, Potaua Biasiny-Tule, Ranui Samuels, Mel Gollan, Raynor Cocker, Tama Kirikiri, David Gillespie, Kevin Shedlock, Sara Stratton, Ben Tairea, Te Taka Keegan, Vincent Egan, Whare Kupenga-Keefe, Hiria Te Rangi, Tim Worth

To those who also wish to remain anonymous but contributed significant whakaaro to this report - we thank you.

Design Team

Victoria Panasenka & Te Iwihoko Te Rangihiraweā (front cover)

³ Nā Ratu Tibble i whakapakehatia

SUMMARY OF KEY FINDINGS

We have collated these findings based on the survey data and the rich feedback provided by our 30 interview participants and Taumata Rangahau members.

Iwi/Māori

1. Build tribal governance awareness and capability to understand technology as it stands today.
2. Note that Technology opportunities should be afforded the same investment consideration alongside primary industries of Fishing, Farming and Forestry.
3. Develop investment evaluation frameworks and guides that can open up technology capital access to whānau and promote safe ways for Iwi to invest in emerging tech sector companies that are led by Māori and employ Māori.
4. Explore and invest in the current and future potential of ‘emerged and emergent’ technologies - Deep Tech, Gaming, Virtual Reality, AI - and understand how these can positively impact Iwi, hapū, and whānau aspirations.
5. Explore investing in Māori led Venture Capital Firms (such as Maui Toa) that are designed to de-risk and provide opportunities for tech investment.
6. Develop Iwi and Māori focused Tech-Sector strategies - including advocating for representation on Tech company boards, NZ Tech⁴, and Te Matarau⁵ - to ensure Iwi and Māori are able to participate, contribute to and protect Māori and Iwi interests in technology developments nationally and internationally.
7. Review and audit Government’s investments into tech education, tech skills acquisition and tech developments to assess how well these are benefiting local Iwi, hapū and whānau aspirations, strategies and goals.
8. Ensure that all tertiary institutions who are leading significant tech research⁶ are providing updates on their work that can identify opportunities to further Iwi aspirations in technology and tech research.
9. Continue to build competence and awareness of tech-centered intellectual property rights and Māori Data Sovereignty⁷ and what this means for whānau, hapū and Iwi.
10. Continue to lobby for improved connectivity services to ensure access to high-quality and stable internet. Inform communities how to access and understand the whakapapa of the Wai776 Māori Spectrum Claim and the work of the Interim Māori Spectrum Trust⁸.
11. Profile uri and uri led companies who are successfully working in the tech sector, via Iwi communications, hui and events.
12. Support rangatahi/taiohi/taitamariki Māori to enter into, and grow within, the tech sector through the provision of scholarships. Engage in locally-led “tech hubs” or match young people with other Māori mentors who are working in the tech sector.

4 <https://nztech.org.nz/>

5 <http://www.tematarau.co.nz/>

6 <https://www.sftichallenge.govt.nz/our-research/projects/spearhead/atea/>

7 <https://www.taiuru.maori.nz/compendium-of-maori-data-sovereignty/>

8 <https://www.maorispectrum.nz/>

13. Invest in Māori-led programmes that support marae and hapū with technical and educational support (for example the Kanorau programme⁹) to grow digital skills.
14. Support Kuia and Kaumātua to navigate digitally enabled services – banking, health, social security, voting – by providing access to digital technology support, appropriate training, and accessible equipment.
15. Actively contribute to government developments through the Industry Transformation Plan (ITP)¹⁰ and other proposed government initiatives in the Tech Sector.

Government

1. Invest and support Māori led technological developments as guaranteed by Te Tiriti o Waitangi in order for Māori to continue to live and thrive in digital ecosystems as Māori.
2. Create an alternative Māori IT Plan that is independent, grassroots-focused and led by Māori IT leaders (such as a National Māori Digital Skills body) for whānau aspirations.
3. Increase targeted government investment in Māori owned tech companies.
4. The Ka Hao investment programme (previously managed by Te Puni Kōkiri) addressed some immediate demands and growth opportunities in tech; we ask that a fund review takes place so the new Kaitiaki (Interim Māori Spectrum Trust) can incorporate these findings into their investment strategy from 2023 and beyond. **Note this fund should not be the only mechanism for investment to strengthen Māori tech innovation.**
5. Align with the Progressive Procurement policy to ensure at least 8 percent of tech contract opportunities are offered to and secured by Māori led tech companies.
6. Work-place apprenticeships, internships, or mentorships. are valued by, and appealing to, Māori experiential learners.
7. Defining valued specific industry skills/needs and registering these through nano/micro-credentials on the NZQA framework would reduce financial costs and enable immediate entry into the tech industry by Māori.
8. Awarding nano/micro-credentials through Recognition of Prior Learning (RPL) would validate industry skills acquired during employment and would provide a number of advanced career pathways for existing Māori tech workers.
9. Remote, rural, underserved, and distributed communities need free and open access to long-term engaging tech programmes – such as Dev Academy – providing the foundation skills and motivation to enter the Tech Sector.
10. Ensure that all marae, hapū and whānau households have equitable and affordable access to the internet.
11. Increase funding and investment into locally led Technology training programmes to increase tech skills within marae, hapu, kura, whare kura, kohanga reo environments.

⁹ <https://kanorau.nz/>

¹⁰ <https://digitaltechtip.nz/>

Industry Transformation Plan (ITP)

1. Māori Data Sovereignty is a Te Tiriti right that must be recognised.
2. On-the-job training was the main opportunity identified to increase Māori engagement in the tech sector.
3. There is a need to apply a kaupapa Māori lens to the ITP to make tech stories more relevant to Māori.
4. Government partnerships are essential to encourage Māori into the tech space.

Tech Sector

1. Move beyond token gestures of partnership and explore implementing Te Tiriti dynamic strategies across your organisation's governance and operations.
2. Engage cultural capability specialists to support your business to grow Māori partnerships and responsiveness.
3. Proactively recruit more Māori onto your governance boards and into senior management roles. Te Tiriti policies, Māori Values and approaches add significant value to organisations.
4. Commercial partnerships and Progressive Procurement can be better utilised to serve and uplift whānau and the general Māori economy and measure the impact of Joint Ventures, Memorandums of Agreement to see the social and financial impact within Māori communities.
5. Invest in Māori talent to join your business and provide mentoring support and pathways to grow them as contributors to their whānau, hapū and Iwi.
6. Aim for Māori to not have to leave their culture at the door and provide a nurturing work environment that enables Māori staff to be able to balance their whānau, community and cultural responsibilities.

Our Recommendations

1. A Government Māori Chief Data and Digital Steward position is created and appointed to work as an equal alongside the Government Chief Data Steward.
2. MBIE create a Te Tiriti-centric Māori Tech Digital unit that is tasked with implementing the key findings of this report and a Kaupapa Māori Research team within that unit for all future Māori tech research.
3. All Crown-funded tech boards must have a Te Tiriti clause that recognises co-governance and has seats for Māori tech representatives that are equal to the Māori population percentage.
4. Develop an All-of-Government stocktake of all Māori tech initiatives and create a Māori Tech Strategy that recognises the disparities facing Māori in tech and fulfil the Crown's obligations to Māori.
5. Any future lead tech research must be co-designed with Māori and uses Kaupapa Māori research methodologies.

6. Provide investment in apprenticeships that support Māori in the tech sector.
7. All future government tech contracts and partnerships to include an enforceable and monitored Te Tiriti clause giving Māori rights to employment, training, governance and Data Sovereignty.
8. Create a new constable Māori Tech fund to encourage research and implementation of emerging technologies to benefit climate change and economic growth.
9. Review all Government funded tech education programmes and ensure that Mātauranga Māori is embedded throughout the programme.

Other recommendations

In the “Toi Hangarau: A Report on Māori-owned Tech companies”, a range of recommendations were made which we endorse and support including:

1. Support Māori-owned tech companies to productise their offerings.
2. Support Māori-owned companies to strengthen their IP development.
3. Potential Iwi investors can help Māori owned technology companies align with their “missions” and in return use the company to build industry skills and capability amongst their upcoming workforce.
4. Provide Government and investor community support for Iwi investors interested in developing their technology investment portfolios better understanding the risks and opportunities and investing in Māori owned technology companies.

Summary map of data captured

Below is a summary of the data collated for an insight into the challenges Māori are facing across the Tech sector.

Surveys were designed to connect to a broad range of participants including:


- rangatahi aged 18-24,
- those who were learning tech skills,
- Māori owners of tech companies and
- broader tech ecosystem players who encourage Māori into Technology opportunities.

The survey was promoted through the Taumata Rangahau and broader community networks via social media. Incentives such as spot prizes were offered to survey participants.

This is an overview of the information captured in our surveys deployed. Please refer to Appendix D pp 67-101 for more in depth response summaries from the community.

 SURVEY DURATION
50 days

 PARTICIPANTS
84 respondents

 **42** wāhine * **2** non-binary
 **38** tāne ? **2** n/a

 MĀORI TECHNICAL EXPERTS
19 companies

3 self-employed
1 had 20-49 employees

13 had 1-19 employees
2 had over 100 employees





28% proactively worked in the tech sector



24% were involved in the tech education/training sector



19% worked as an **influencer** in Māori tech encouraging and inspiring whānau into tech



15% use **technology** in their work



3% are learning technology skills



3% are looking for tech mahi



75% have an undergraduate degree or higher however



57% did not have a qualification related to **Digital Technologies** (Computing, Mobile Application Development, Web Services, Databases, Coding)



HIGHEST MOTIVATION FACTOR
Focused on ways to improve the well-being of whānau and community.



LEAST MOTIVATION FACTOR
Financial and personal factors were the least motivational factors.

Industry Transformation Plan Responses

61%

were generally **supportive** of the Industry Transformation Plan



73%

acknowledge the **critical role the government** will play in encouraging and engaging Māori in the tech sector which should be driven by a true partnership approach and not dominated by “ticking the boxes”



82%

regarded the ongoing engagement of Māori in the **tech sector as critical**.

They agree that Government acknowledgement of tikanga Māori is a fundamental component of this engagement.



72%

are very conscious of the importance of exports to grow the tech sector in New Zealand



86%

acknowledge that effective engagement by Māori in the tech sector would be **driven by a highly skilled workforce**



62%

are very **conscious of the importance of data**, the value of controlling access to data and the impact of decisions made from data analysis.

Respondents agree on a Māori approach to the concept of data would add value to the whole sector.



66%

acknowledge **authentic, beneficial stories raise the profile of the tech sector**, and encourage engagement



Common responses

All the interviewees in their stories identified the following:

- Being Māori and being in Māori in tech is a superpower

"..understanding Māori needs and designing from a Māori perspective, often leads to models of care and digital solutions that are beautiful and beneficial for Māori and non-Māori."

- Applying tikanga Māori and culture into a technology business enhances productive outcomes for whānau

"Provide a vehicle for Māori to express our culture, innovations, creativity and create jobs for whānau."

- Equitable access to capital and ensuring Māori are part of the decision-making is critical to the success of Māori led tech companies

"We need more Māori on those boards that are making the decisions on where funding is going. I'm not talking about just academics, there needs to be industry representation there as well."

- The need to celebrate the successes of those who work inside or are disrupting the tech industry

"More heroes and exposing those heroes. I've worked with a number of Māori in tech that go unnoticed and don't speak up because we're too humble. If our rangatahi knew about these people, they would see that there are successful pathways that can be made, and so will encourage more rangatahi to get involved."

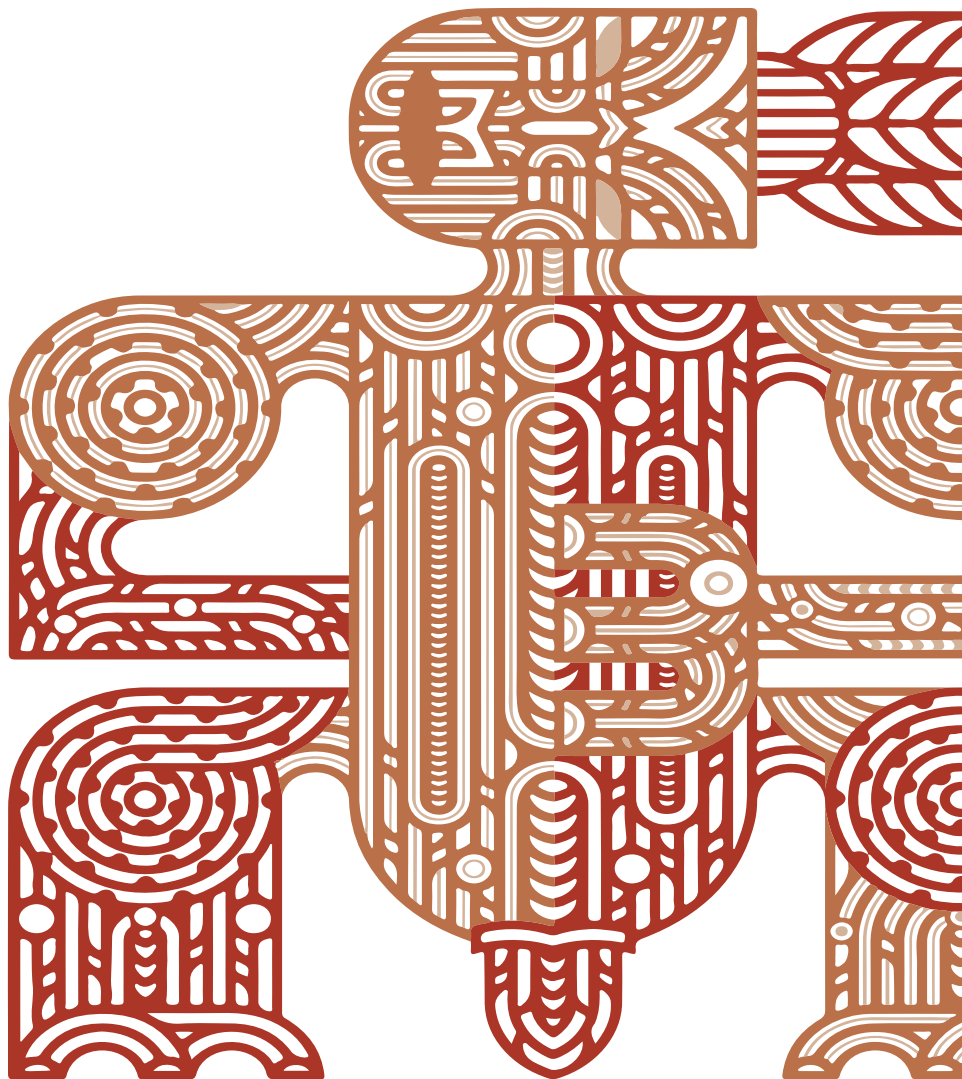
The importance of intentional development, providing opportunities for Māori to thrive within tech environments

"Growing the skill set of our people past the usual and typical job roles. Getting them to create whānau wealth (tech jobs pay very well). Creating environments where our people can flourish and grow and be inventive."

Kia tūpato

There were some who wanted to ensure we tread mindfully and carefully in the pursuit of growth and profits at the expense of all else:

"We need to stop obsessing about accelerated growth if that growth is going in the wrong direction. We need strong foundations, specifically locally owned critical cloud infrastructure, not overly relying as we do today on overseas-owned big tech."



REPORTING SURVEY DATA

The survey results were collected over 50 days with 84 respondents who had completed the survey with no reported problems. There appeared to be no gender bias in the sample with 42 of the respondents being female, 38 male, 2 non-binary and 2 preferring not to identify (see Fig. 1 below).



Fig. 1 - Gender statistics

Four separate, directed, questionnaires were used to collect data. While all questionnaires contained some common items such as Iwi affiliation and gender, each questionnaire was designed to explore the perceptions of identified cohorts. Therefore, the survey data and the total number of respondents could vary, in reporting. However, this is noted in the graphs presented.

Some respondents acknowledged affiliation to more than one Iwi with multiple geographical locations. Therefore, the responses for geographical locations and Iwi affiliation are greater than the number of respondents.

The survey was extended to close on January 30, 2023, to provide more input from across communities.

The respondents represented a broad spectrum of the Māori tech sector from those learning technology skills to those working to encourage and inspire Māori to engage in the tech sector. See Fig. 2 below.

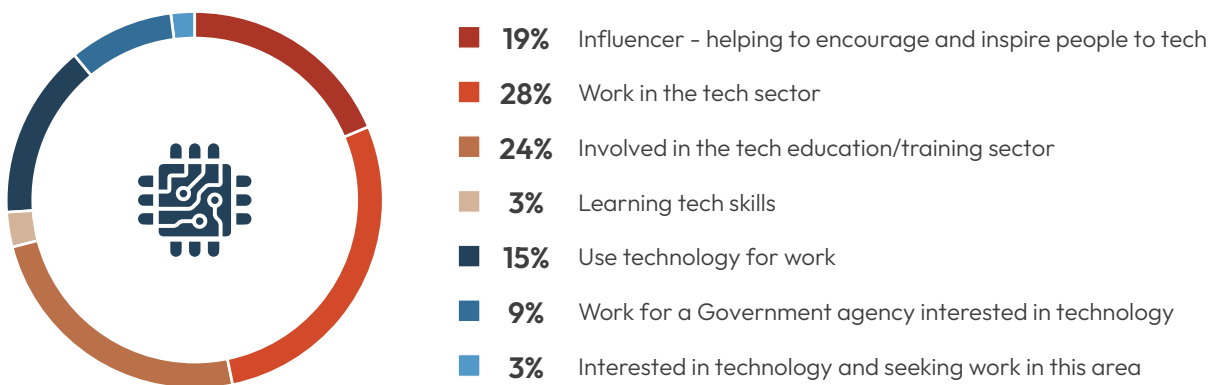


Fig. 2 - Roles and responsibilities

The respondents were very well educated with 75% of respondents completing a tertiary degree or higher. See Fig. 3 below.

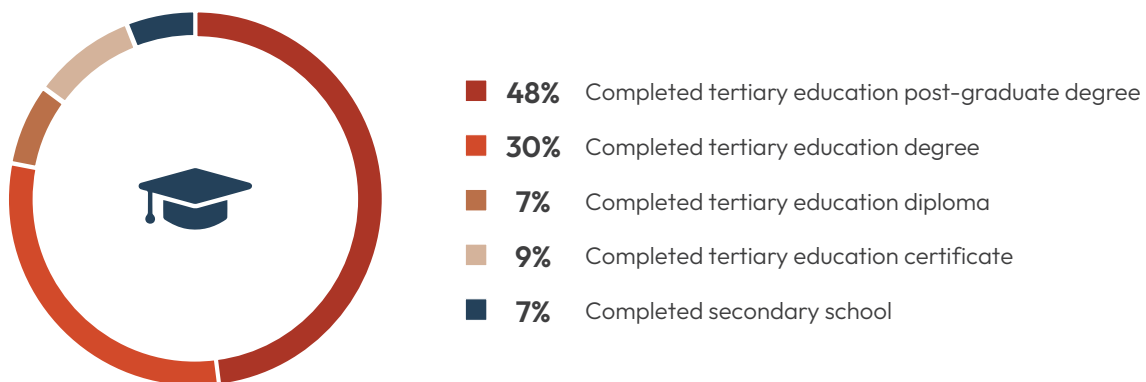


Fig. 3 - Educational qualifications

Although respondents were highly qualified, it was notable that a significant number (57%) did not have a qualification related to Digital Technologies - Computing, Mobile Application Development, Web Services, Databases, Coding. See Fig. 4 below.

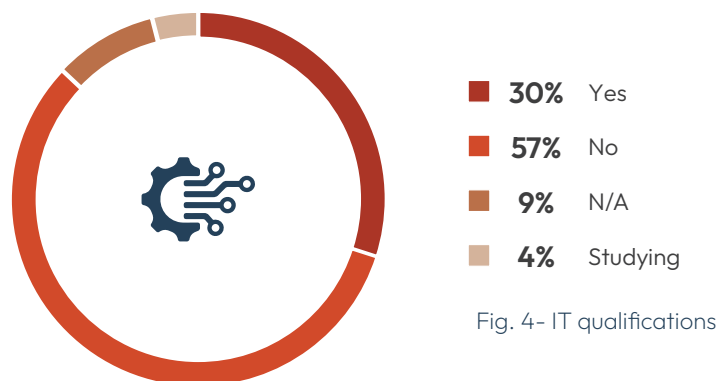


Fig. 4- IT qualifications

Drivers for engagement in the technology sector

In exploring the reasons for participants' engagement in the tech sector, it was notable that the highest motivation factors were focused on ways to improve the well-being of whānau and community. Financial and personal factors were the least motivational factors (see Fig. 5).



HIGH MOTIVATION

Being able to be themselves as Māori and make a difference in their communities



MEDIUM MOTIVATION

Allowing participants to be independent, find employment and tell their stories are important factors in attracting Māori to tech.



LOW MOTIVATION

Making money and building a reputation is not as motivational to Māori as serving their communities.

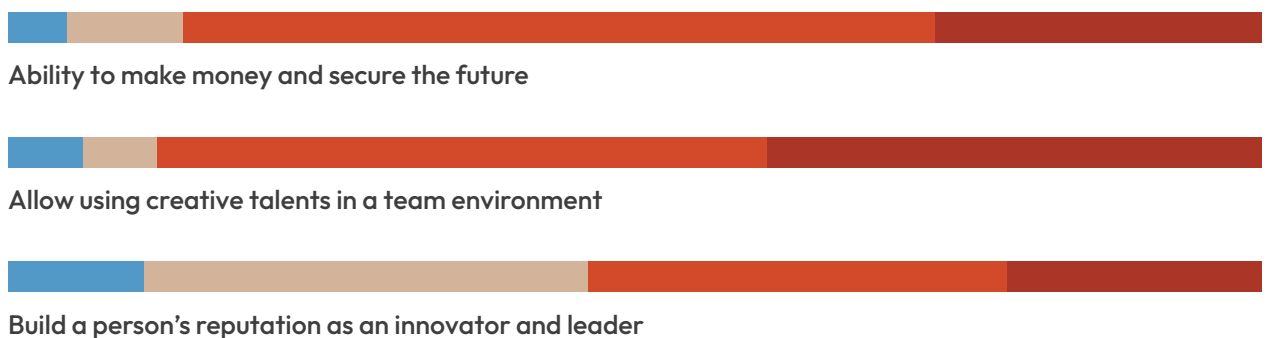


Fig. 5 - Drivers for engagement in tech sector

Education

Respondents agree the current Māori Technology Ecosystem relies on a limited number of Māori staff working in companies and across the sector to do the connecting, the inspiring, and advising. Because they are relatively few in number, are motivated to improve the well-being of their whānau and communities and given the increasing demands and poor resourcing, they are increasingly stretched.

One solution to this issue is to increase the skill set and expertise of those entering and/or currently working in the sector and a significant majority of respondents are willing to address this challenge.

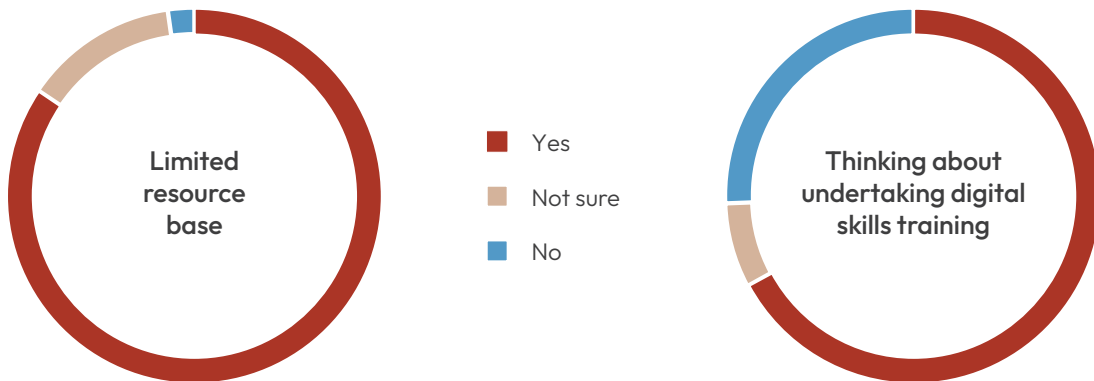


Fig. 6 - Māori staff as a limited resource

Fig. 7 - Planning future training

However, current educational provision is failing to serve this need. In fact, respondents indicated pursuing further learning in traditional settings using traditional approaches was the least preferred option.

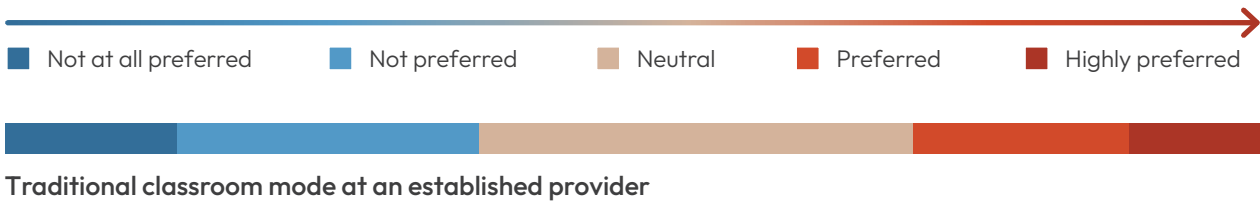


Fig. 8 - Traditional classroom preferences

Respondents were more comfortable with kaupapa Māori approaches including overnight and/or day facilitated wānanga.



Fig. 9 - Day-facilitated wānanga and online learning preferences



Fig. 10 - Overnight wānanga and group activities preferences

But as noted in the report “learn as you work” alternatives appear to be the best fit for the acquisition of advanced technology skills.



A mixed mode of real-time technologies (video-conferencing), classroom and online activities

Fig. 11 - Mixed mode learning preferences, including classroom

We can assess that having a mixed approach to content delivery is important to the learners who participated.



A mixed mode of real-time technologies (video-conferencing) and online activities

Fig. 12 - Mixed mode learning preferences, not including classroom

And participants enjoyed situations where classrooms were not a prerequisite for course completion.

Overall the survey provides some helpful insights into motivations and the style of learning and teaching they would prefer.

What is Māori technology?

Keegan and O'Carrol (Sciasica) confirm that:

"Technology can be defined as tools, devices and machines that have been developed by the application of scientific knowledge. Māori technology, then, is Māori tools, devices and machines that have been developed by the application of Māori scientific knowledge".

For our survey respondents, Māori Tech meant:

"Enabling better employment for Māori and also allowing Māori to be creative and innovative".

Another felt:

"From my understanding, it is Māori creating opportunity in the tech space".



Fig. 13 - Tikanga Māori and technology

11 Keegan, T. T. A. G., & Sciasica, A. D. (2018). Hangarau me te Māori: Māori and technology. In M. Reilly, S. Duncan, G. Leoni, L. Paterson, L. Carter, M. Rātima, & P. Rewi (Eds.), *Te Kōparapara: An Introduction to the Māori World* (pp. 359–371). Auckland, New Zealand: Auckland University Press.

The tech ecosystem is an interwoven and integrated environment that Māori communities need to be involved in from creation to consummation.

110 *"Like most Māori, we think of the past, the present and the future all collectively... Our interpretation of our stories and how the world came to be. The stories of the separation of Rangī and Papa, all their children and all the things that came from that was pretty much our paradigm of whakapapa..."*

During the face-to-face interviews, Māori technologies were indeed regarded as a woven relationship and the participants indicated that is what defined Māori technologies are and that they were guided by tikanga.

117 *"... his uncle mentioned something to him that kind of resonates with me and he said that what we are trying to do is we are leaning towards our old ways of knowing with new ways of doing and that's what I feel like Māori Tech is for me."*

Based upon and driven and guided by values:

111 *"Have I observed that it is embedded in different values?... Have I observed that it feels different to be part of, it feels different to support, it feels different and is different to be around the parameters of? Absolutely, absolutely... Do I love that it is radically different? Absolutely!"*

And founded on culture:

114 *"I see our point of difference, and what makes us different to every other technologist in NZ let alone the world, is our culture being the difference. That's the thing that will solve a lot of global problems, the indigenous worldview and how we apply it to an enabler like technology, is the thing that's going to help us solve a lot of problems."*

And history:

118 *"In the wider sense, I think Māori technology relates to any technology that's been used from... i te tīmatanga mai ko te kore, so from the beginning right to now. So that's anything from celestial navigation and seafaring, traversing the oceans right up to what we're doing right now which is a lot in the digital and industrial spaces."*

This means a one size fits all definition of Māori technology is difficult to articulate. Indeed, in specific situations, at specific times, the meaning of Māori technology will reflect the intent or purpose of the solution proposed.

The adoption of Technology, Te Tiriti and its relevance to the NZ tech sector

In the 18th and 19th centuries, Māori faced a world dominated by revolutionary Western agricultural and industrial technologies that forever changed the way they hunted, fished, produced, crafted, and built. Māori adopted Western technological artefacts which they found useful to themselves as individuals and to their hapū communities in general.

Food production increased with the adoption of high yield easily cultivated Agri-tech products such as potatoes. Protein requirements were met with easily reared biotech advancements in pigs.



Fig. 14 - Māori views of the world

Metal tools greatly influenced carving, fishing and other activities that had previously used stone tools. Print presses were able to store, disseminate and transport information rapidly. The integration of Western technologies brought new opportunities to early adopters in areas of high European settlement.

However, it left others, who had limited access, at a disadvantage. The changes, enabled by European technologies, impacted all aspects of Māori life from diet, food production, animal husbandry, adjustments from oral to written communication and, to changes in status. Māori, conscious of the shifting landscape and the rapidly increasing European presence, entered into negotiations with Britain, the dominant European presence at that time, to try and create a roadmap forward. The result is Te Tiriti o Waitangi.

Today, Te Tiriti is widely accepted to be a constitutional founding document that establishes and guides the relationship between the Crown in Aotearoa/Te Waipounamu New Zealand (embodied by our government) and Māori. Te Tiriti promised to protect Māori culture and to enable Māori to continue to live in New Zealand as Māori.

The current digital transformation – that Māori are eager to embrace and utilise – brings into focus on the relevance of Te Tiriti o Waitangi and the need to enable Māori to continue to live in digital ecosystems as Māori. In previous evaluations of government policy, The Waitangi Tribunal found that New Zealand’s legislative, policy and administrative framework is not, in fact, fit to achieve desired outcomes.

The Tribunal proposed a new set of five principles, that are relevant to all sectors, to frame future engagement with Māori. The five treaty principles “Tino rangatiratanga, Equity, Active protection, Partnership, Options” could be interpreted and applied, which emerged in the interviews often.

Tino rangatiratanga

The right to integrate technological initiatives in ways that are appropriate and to exercise autonomy and self-determination over the impact and reach of the technologies embraced (Article II of Te Tiriti).

111 *“...how do we support our moana peoples, that being defined as Māori and Pacific, to thrive within the industry; and also, to move beyond contributing to it, but controlling its direction.”*

109 *“That’s because we are creators. We are so fast at picking up technology and making it suit us, so I don’t know why we’re trying to turn everybody into essentially a farmhand for tech.”*

120 *“It turns out that we’ve got a higher aptitude for teamwork, collaboration, communication; you can’t shut a Māori up. If you’ve got the right team, the right kaupapa, and everyone collaborating and connecting and communicating, for us that’s beautiful but I think for the system, it’s quite dangerous...”*

Equity

Māori will not only have equal access to technologies it should include a vision of equitable outcomes in technological advancement for Māori (Article 3 of Te Tiriti).

109 *“Because it’s not built for us or by us. ..., if I can use the analogy of sheep. A lot of the time technology is used to gather the sheep together, shear their wool off and then leave the poor sheep to either starve or get cold... There is no utu there. It’s way off balance.”*

There are also challenges around systemic tokenism and broader systemic issues facing both Māori and Pasifika in tech:

101 *“The funding landscapes especially for research funding and watching, you know, MBIE Health Research Council, all those big funders that start weaving in Māori values but when you go through the process, it’s like ‘Where is it? Where are all these values that you’re claiming.’”*

Active protection

Māori contribution to economic growth through distinctive Indigenous innovation is to be recognised and valued. This requires the Crown to act, to the fullest extent practicable, to achieve equitable outcomes for Māori technological enterprises. This includes ensuring that it, and its agents, are well informed on the extent, and nature, of existing Māori technological enterprises (Articles II and III of Te Tiriti).

P28 *"But for us being a Māori company, it's all about kaupapa and tikanga. The two parts of our business that we feel make us a Māori business - especially in technology - is that we have a very special ethos that we drive."*

Partnership

The principle of partnership, which requires the Crown and Māori to work in partnership in the governance, design, delivery, and monitoring of technological services. Māori must be co-designers, with the Crown, of the digital technology road map for Māori (Articles I and II of Te Tiriti).

m *"A lot of people in governance positions do not have connections into their communities on a regular level where they know what's going on"*

Options

The principle of options, which requires the Crown to provide for and properly resource kaupapa Māori digital technological development. Furthermore, the Crown is obliged to ensure that all digital technology services are provided in a culturally appropriate way that recognises and supports Māori (Articles II and III of Te Tiriti).

"I think the biggest thing for me is trust around New Zealand tech as a whole. I think the concentration... and colonisation to a certain extent, but what I was trying to say was consolidation of power that they have."

People • Place • Product

Ina kei te mohio koe ko wai koe,
I anga mai koe i hea, kei te anga atu ki hea.



A Māori view of the tech eco-system and technology

In a Western worldview, technology is the result of applying scientific principles to a problem and producing artefact(s). These artefacts are used to improve the human condition in health, industry, recreation, transport, and well-being. Technologies then are regarded as inert, lifeless entities that humans create and control. However, for Māori, technology is framed by a woven relationship between the artefact, the worldviews and beliefs of the people using that artefact, and the ecosystem it is used in - the Rohe and all things that exist within the Rohe, (land, water, and all living things), it is deployed in.



Fig. 15 - Māori view of the tech ecosystem and technology

Māori have had a long history in the use and mastery of new technologies. Adapting to the elements to traverse the Pacific Oceans as navigators and wayfarers relocating to Aotearoa and Te Waipounamu. As a people, Māori have continually recognised the need to successfully acquire the advanced technological knowledge, skills and attitudes that contribute to innovation, economic growth, and social well-being of whānau, hapū and iwi. These are documented in stories of Maui and Te Ahi a Mahuika - the challenge to consumerism and in Maui i a te Ra - to gain value by controlling the technology.

There is a need to develop a comprehensive matrix of measurement that acknowledges the accrued by change in perceptions, assumptions, and beliefs in a Māori worldview.

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“We need more Māori on those boards that are making decisions with where funding is going and I’m not talking about just academics there needs to be industry representation there as well so one of the struggles that we have all the time is getting Government organisations to understand like really understand the way that we operate as a business where we judge ourselves and our value on the impact that we’re having on communities we don’t base it on our revenues and our profits that come in every year. It’s great to have and obviously, we want to make money and keep going but for us, that’s second to what we are doing for our communities and for our people and that’s not just here, that’s overseas as well.”

Technology, recreation and work are inseparable, interwoven, and interdependent. Harnessing technology can increase productivity, health, community well-being, and individual wealth. Māori have a rich and well-documented history of acquiring, adapting, and adopting technologies to meet their specific needs. They do this without losing sight of what they hold dear, who they are, where they come from and how they will face the future.

Acquisition, adoption, and adaptation have never occurred by chance, it has been purposefully and intentionally led, community-supported, thoughtful, considered, planned, and operation-alised. As we move into the age of transformation, driven by digital technologies; the peoples, economy, practices, and communities of Aotearoa are being altered in fundamental ways. During this transformation Māori are looking to the past, to inform the present, and to safeguard the future. *Kia whakatōmuri te haere whakamua.*

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“I have the view that Māori have a much more holistic and much more integrated approach to how they look at life. It’s not even something that is intentional, it’s just their way of being and it’s coded into their DNA in terms of how they operate as a culture.”

Applying tikanga to technology

Tikanga Māori translates as Māori custom, representing and indicating customs and traditions, heritage and hereditary tribal narratives. Our protocols of responsive Māori and indigenous methods, tikanga are distinctly insightful for reflection and celebration to look to the future with increasing pride of our customary tikanga sources. Reclaiming our identity, unique tikanga knowledge opportunities that have been handed down through many generations and have been accepted as a consistent, steadfast, and appropriate way to infuse our sovereignty as a positive change, a transformative progressive agent. A way of achieving and fulfilling certain objectives and goals. Such proven methods together with their accompanying protocols are integrated into the general cultural institutions of society and incorporated into the cultural system of standards, values, attitudes, and beliefs¹².

Participants identified six key tikanga that are associated with technology: Whānaungatanga, Rangatiratanga, Mauri, Manaakitanga, Kaitiakitanga and Kotahitanga.

12 Marsden, Māori., Henare, T. A., New Zealand. Ministry for the Environment, 1992

Rangatiratanga

Is used in Article II of Te Tiriti o Waitangi to convey the idea of the unqualified exercise of Māori chieftainship over their taonga. The term is often associated with sovereignty, leadership, autonomy to make decisions, and self-determination.

It was clear when working with clients such as hapū or iwi the developers felt it important that the clients had sufficient information to make informed choices and take control.

104

"I want to see Māori world specialists doing artificial intelligence and not just commenting on the use of artificial intelligence. I want them being able to build artificially intelligent systems, who can do videoing of that, so I want people who are data analysts, so I want them to be able to do all of those range of skills."

P4-5

"It's definitely a point of difference. We haven't done an investment raise or appointed external investors...so it's been a lot easier to build relationships and navigate in that space because we don't have anyone else coming in who could be looking to take IP from us, or could really misuse some of the information that we're given to use..."

Whanaungatanga

Whanaungatanga is about forming and maintaining relationships and strengthening ties between other Māori individuals, hapū, iwi, marae and organisations. Relationships and connections are central to Māori and Māori well-being.

Businesses that employed people or served clients started by making connections, creating a sense of oneness to successfully complete a common goal that was useful for everyone.

"Our people have to back ourselves so let's back each other, and back them when they stuff up, we're gonna make mistakes, you're gonna get it wrong sometimes."

"Māori values emphasise being a part of an ecosystem and interacting harmoniously within a network approach."

Kotahitanga

Literally means unity and is a term used in He Whakaputanga o te Rangatiratanga o Nu Tirenī: the Declaration of Independence of the United Tribes of New Zealand. A way to ensure Māori remain as one and not fragmented and easily divided.

Māori business networks were open to working together on joint projects, sharing ideas, concepts, processes, and skills to ensure all had opportunities for success.

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"We are building content. We are building narratives. We are building little mini... video documentary series, we're building portraits. We're building all of these things. I have full intentions to build a whole bunch of stock imagery. Because if you even look at Google, Māori and tech, or something like Canva, we don't exist."

Mauri

Mauri is the life essence inherent in all living things, that has been passed down from ancestors through whakapapa. In te ao Māori, data is tapu and contains the mauri of the person it is about, systems then contain mauri.

Some participants recognised the artefacts had their own life force. Developers had a “duty of care” to ensure the people using the artefacts did so in ways that were beneficial to them and did not create harm.

110 *“There’s a process of creating a design from natural materials. I guess as I started to get more familiar with the powers of a computer I could see the similar means of creating things with a mouse and a keyboard. How do we put ourselves into their shoes and use these tools of today to continue the means of telling those stories”.*

Manaakitanga

How Māori individuals, hapū, iwi, marae and organisations care about each other’s well-being, nurture relationships, take responsibility to provide hospitality and protection and engage with one another in respectful and mutually beneficial manners.

It is about giving generously to the community, looking for the long-term benefits ensuring the well-being of their clients, a duty of care.

131 *“I think most people view entrepreneurship as being motivated by financial means. My experience of entrepreneurship is not that finances are a means to an end. Entrepreneurship, from my perspective and my own experience, is driven by something much deeper than just a financial requirement.”*

Many of the participants were clear the motive for engaging with technology was not for personal gain or profit. They were driven by the need to act for long-term or future benefit of their communities and others.

112 *“From a te ao Māori perspective we have different aspirations for our marae or hapū, iwi, whānau. I think from a Māori perspective it’s not always just about making the money through digital technologies but perhaps trying to save our environment or maximise the potential for future generations”.*

Kaitiakitanga

Kaitiakitanga is widely used as a term of guardianship, to ensure a sustainable future for all and to ensure that as a kaitiaki, you leave the resource in a better condition than when you inherited it. There are many common concepts and values of Te Ao Māori, such as mana, whakapapa of people to the environment, knowledge (mātauranga), spiritual beliefs and customary practice. These world views and practices maintain and support the well-being of the individual, hapū, iwi, marae and organisation.

Developers were often entrusted with sensitive information or introducing technologies that could expose users to harm; they had a duty of guardianship and protection to their clients.

102 *“We think about digital technologies as an application that we use at the end of our computers, but there’s so much behind it, so when we apply kaitiakitanga, what are we doing with our physical assets at the end of it?... I’ve just got our organisation set up the recycling, that regeneration, that sustainability piece, again that needs to be part of your design principles, if you’re not doing that with kaitiakitanga in mind then you’re not doing it.”*

Measuring impact

When technology is regarded as inert and lifeless, created and controlled by humans, measuring the impact of the technology on health, industry, recreation, transport, and well-being can be numeric – the number of people receiving treatment and the participation rates in activities.

However, when technology is framed by a woven relationship between the artefact, the people, and the ecosystem, numeric measurements are difficult to apply. How do you measure intergenerational changes in lived culture – perception, fundamental assumptions, and beliefs?

“...understanding Māori needs and designing from a Māori perspective, often leads to models of care and digital solutions that are beautiful and beneficial for Māori and non-Māori.”

“Kaupapa Māori businesses...explicitly centring their existence around serving their communities and pursuing societal goals.”

There is a need to develop a comprehensive matrix of measurement that acknowledges the benefits accrued by a change in perceptions, assumptions, and beliefs in a Māori worldview.

101

“We need more Māori on those boards that are making decisions with where funding is going and I’m not talking about just academics there needs to be industry representation there as well, one of the struggles that we have all the time is getting Government organisations to understand like really understand the way that we operate as a business where we judge ourselves and our value on the impact that we’re having on communities we don’t base it on our revenues and our profits that come in every year.”

Māori views of the Industry Transformation Plan (ITP)

The Government's vision for the information and technology sector is being delivered through the development and implementation of an Industry Transformation Plan (ITP). The intention of the ITP process is to bring together all relevant parties around an industry to agree on a long-term vision for the industry and identify the actions that can be taken by industry, government, and others to realise this vision. This ITP approach is influenced by an international trend, a focused innovation policy approach, that a number of small, advanced economies (SAEs) – Denmark, The Netherlands, Finland, Sweden, and others- have taken. The ITP acknowledges that as a Tiriti partner, the sector needs to actively engage Māori. It recognises a te ao Māori approach can be a valuable differentiator for Aotearoa in the international arena. It also notes the Tiriti principle for Māori to “walk in two worlds”. During the face-to-face interviews, a key focus was on how a te ao Māori approach, “walking in the second work” could be integrated, acknowledged, or aligned to the ITP.

Empowerment

A recurring theme was on the future of Māori technology was creating equitable outcomes for Māori. Respondents hoped their stories would inspire the next generation of Māori youth to choose technology and/or entrepreneurship as a career path. This would ensure future employment activities would shift from low-value, physical positions to high-value knowledge-based positions.

P7 *“... we've actually been really deliberate in our recruiting process, to go out of our way to find Māori people to participate or kind of go through those programmes; because they don't normally stick their hands up.”*

P18 *“By sharing power with Māori communities and allowing them to run their own programs, we can create an environment that supports Māori students' success in STEM fields.”*

They agreed with the ITP that initiatives need to be developed to ensure Māori tech champions are known and active in regions. This would create inspiring “Māori Tech Stories”. We believe Iwi/Māori communities should also be championing their own uri:

P10 *“I don't hear people talking about them. If it comes to our sports everyone knows them all. Everyone will claim them as their whānau but our digital business leaders, no.”*

P8 *“... who are the heroes they look up to and say, 'Well that guy started that business and he was a Māori and he's being successful now; I can be successful too.'”*

Respondents agreed the ITP proposal allowed them, and others in the sector, to “walk” in the internationally connected world. However further clarity, given Māori previous experience with government initiatives, was needed on how they would be empowered to walk in the “Māori world”. This included clarity around the creation and roles and responsibilities of the proposed Māori Digital skills body.

P14 *“I actually think the majority of that mahi, if not all of it, should be led by Māori, because that's just the way it should be. Important... members of the Māori tech community to be at the table to ensure and hold them (MBIE) accountable and keep them honest, because if we don't then what could happen - and it's happened before - is they'll design something that they think will be good for us but it will turn out that it won't be good for us.”*

Valuable differentiator

It was largely agreed that Māori approaches to business in the technology sector provided a unique approach that built networks and support systems beneficial to business.

P16 *"Incorporating Māori values and tikanga into a business can provide a competitive advantage, as well as contribute positively to the world."*

P7 *"... a little bit special in the way that they work together. And if you think about our business model of this kind of ecosystem effect; you can only pull that off if everyone believes in the shared goals and the shared vision, and collective good... in terms of the idea that if we work together, we're going to be stronger."*

The unique Māori approach could be seen as valuable to Pasifika and other Indigenous Peoples.

P16 *"... embracing indigenous wisdom and worldviews can help address various global issues, such as social cohesion, nationalism, and the shift towards negative tribalism."*

P14 *"... if Māori in tech is working for the betterment of their communities, then that same business model can be applied to other indigenous people. "other indigenous people around the globe,... and it's really just supporting our people that we know pretty much have been through the same colonisation process as we have, understanding the challenges that they have currently and their past."*

Existing pathways

It was highlighted that there was an underrepresentation of Māori in the wider technology sector. The reasons for this were varied. There was an acknowledgement that some technology firms were welcoming and supportive and enabled employees to establish themselves, and grow, in the sector.

P30 *"What are those? What are tech pathways? How do you find out what tech pathways are? ...There are so many different pathways but there is also a lot of lack of clarity around.."*

P18 *"... we just participate in this thing we call Māori technology with a focus on digital creativity. That's sort of our thing. As well as supporting others that might be interested in this space as a potential career path."*

However, this was not consistent and at times new Māori employees felt uncomfortable or unsupported in the work environment experienced on first entry.

P17 *"Interviewers and hiring managers may lack cultural competency, leading to misunderstandings or misconceptions about Māori candidates' behaviours, such as avoiding eye contact and not talking themselves up."*

P25 *"How we keep Māori in this environment, it's keeping that environment safe for them."*

There was a feeling some enterprises, while acknowledging the need to be aware of and acknowledge Māori tikanga, followed a "tick box" approach rather than making a real commitment to ensure that Māori tikanga was operationalised.

P34 *"Māori technology talent it's really, really difficult to get so in order to retain it in these workplaces we need to make culturally safe places for Māori to come into."*

P19 *"... if we don't feel connected to a place we probably don't want to be there. If we don't have an understanding from our employers about what it is to be Māori, like saying our name correctly. It could be something as simple as just that."*

Educational opportunities

The currently funded educational providers failed to meet the educational aspirations of Māori. Many Māori wanted to engage in studies that would allow them to “earn as they learn” and continue to contribute to their family’s well-being. They agreed the ITP work-based, workplace approach such as “apprenticeships” would increase engagement.

P49 *“That’s been another sort of kaupapa that’s been reinforced by our education system about the individual learner, about how you’ve gotta really grow the individual learner, give them all the tools to be successful by themselves. Which again goes completely in the face of the way that we do things in te ao Māori, which is about being successful together.”*

P6 *“Show our rangatahi how they can get involved now. The valuable, readily attainable skills they can actually go out and use now.”*

Formal studies meant learners were forced to incur financial penalties, first from paying fees to institutions, and second from being unemployed while undertaking the qualification. They resented having to pay for “irrelevant” courses, e.g., history of computing, and agreed with the ITP that short courses / certifications / micro-credentials provided better value:

P21 *“I’m a great advocate for digital apprenticeships and think we should make it easy for whānau to say yes.”*

P46 *“You could do a year’s worth of study or less and you’re industry ready. Whereas if you go to university you could study something for three or four years and then by the time you come out all your knowledge is obsolete and then you’ve got to retrain anyway.”*

Previous educational experiences shaped perceptions of existing educational providers. There was support for the ITP proposal, and for the development of Tech education for Māori, by Māori and in a Māori environment

P30 *“Māori tend to be pushed into the softer kind of subject matters and if you want to do technology-based jobs, maths and physics are absolutely critical. I think that that is a fundamental building block we are missing right across the schooling system for Māori.”*

P21 *“... many rangatahi will be the first in their whānau to enter the tech sector. By offering paid training and job security, we help alleviate any collective feelings of uncertainty around what a career in tech might lead to.”*

Work-placed learning

Business leaders confirm the ITP conclusion that relevant industry experience is a primary driver for employment. They also recognised there is a hesitance to develop talent – internships, work placement – because their business was “lean” and all costs needed to be justified. However, they acknowledged that as a Māori business, built on Manaakitanga, they would provide these opportunities to their people if they were cost-neutral, that is adequately funded.

P26 *“I do think the trade to trades is the great way to go. It is the way that you can upskill people on the way but it’s draining, it’s intensive, the amount of human resource that you need to prop that up is considerable ...”*

P31 *“If we had some very clear pathways direct into work whilst at the same time gaining qualifications, not just low-level qualifications as they earn but actually qualifications that will lead them into high-value careers.”*

There was support for a Māori nationally coordinated internship platform, to reduce the cost of internships and scale up the provision of work experience nationwide.

P30 *"Our rangatahi who are doing IT degrees are faced with barriers by being Māori in STEM-related qualifications, and as the only brown-faced in the classroom this can leave them feeling very isolated being away from family, plus affordability - having to move away from home, and being unable to afford to go to hostels."*

P19 *"... for young people to really feel they belong in these places is most important."*

Timing

That current funding models outlined in the ITP - 1-year, 2-year, 3-year- did not acknowledge a Māori inter-generational approach. This approach requires extended timeframes for funding, especially if you want to track the progress of a generation.

P37 *"We talk longevity, because I'm talking about making the world better for my mokos. If that concept is not grasped within a framework in which our partners or government are trying to support us, we're down the stream without a paddle."*

P56 *"... involved in a Māori marae connectivity hui in a pilot program. It was so successful and the government chopped that funding. I'm like, 'well, how dumb is that,' because it was successful. There are those sorts of reasons why Māori aren't seen more prominently."*

It was hoped ITP projects funded would not be pressured, as they were in the past, to be "completed", meeting contractual obligations, without acknowledging the benefits extended project timeframes and funding could accrue.

P37 *"We are fighting against the challenges set upon us by the Pākehā frames that we need to work in, considering that our frames are tikanga tūturu, that have come with our ancestors from back then."*

P15 *"... they'll just do something to get it pushed through, check the box, get the people in, all the metrics...this happens a lot, and that potentially could be due to the short-term vision of the funding streams but also the objectives they may need to fulfil within a financial year."*

Business support

The government agencies were unaware of the existing skill set in within the Māori technology sector in the awarding of contracts. This not only occurred across departments but within departments. The establishment of a Māori Digital skills body may address this issue.

P42 *"There needs to be more practical discussions with the people actually out there doing the mahi, who aren't the ones that you would normally talk to. There's a lot of gold to be mined in those discussions I believe."*

P26 *"When we talk about the Māori tech ecosystem you've got education issues, you've got businesses, you've got tertiary. There are lots of moving parts."*

Lack of funding

A significant number of successful Māori technical initiatives were discovered. However, these were often funded through short-term contracts. Māori generally agreed with the ITP that supporting and scaling up these existing initiatives was preferable to starting from scratch.

P15 *"All they need to do is send an email, like literally and say, 'hey we've got this funding that's come available from DIA, this is the objective, they're trying to connect with Māori and Pacific communities, what can you do?' And we'll be like 'mate, we can do whatever you want us to do, 'cause look, we're already doing that.'"*

P33 *"You can't just say in a plan, 'we want you to do this,' there's got to be something that follows it; either in resources or either in infrastructures or networks or something, there's got to be an action that results in that kind of change or supports that change in behaviour or supports that kind of growth."*

Supporting innovation

That existing innovation strategies, such as innovation hubs, were aligned with existing tertiary providers. Their structures, funding models, and processes often did not fit Māori expectations.

P62 *"Meeting those people where they are, where they are from, so at the marae or their wāhi tapu. It's just who we are, and how we approach our business is based on all our tupuna values and the ways we were brought up. And I know that's different because it's not like a sort of hard and fast, get the money kind of thing when it comes to those relationships."*

P39 *"Compare the importance of these spaces to a wharenui, which Māori would be 'lost' without. Why aren't there digital spaces so that Māori can come together and shape our own future and plot our own path instead of having to go to a university or library?."*

Marae focused

The hub of the Māori community is the Marae, and many participants were keen to see a focus on developing this existing resource as an innovation hub.

P12 *"Where the mana lies in Māoridom, is in the marae and the hapū."*

P49 *"At Te Herenga Waka, it was Te Herenga Waka that got me through. "It wasn't Victoria University, it was Te Herenga Waka, the marae, all the Māori students and all the Māori staff."*

Rangatiratanga

Māori wanted to be "shapers" of technology rather than "consumers". Examples of current success stories for youth were notable:

P47 *"For me when we run our programs for kids we like to run tech expos where we have different stations. We could have videography, 3D printing, eCommerce, hardware, programming, gaming and the kids just rotate through so it keeps exposing them to different things in tech and what is available to them and how they can make a living through tech."*

P53 *"The shapers of the technologies are obviously the philosophers, the deliverers of policy are Governments, the Managers implement the systems. Whilst multiple complexities exist, an aspiration should be to pursue tino-rangatiratanga where we (as Māori) have the skilled academics to look into the future, the skilled Māori who understand Māori processes, we have Māori developed hardware, we have Māori developed software as a technical system guided by our social rules and values..."*

Government procurement

It was agreed with the ITP that a guide be produced for operationalising broader outcomes, with a focus on New Zealand ICT businesses, in their case particularly Māori, accessing government procurement opportunities.

P44 *"... no New Zealander should be riding in an Uber. They should all be riding in a Zoomy which is a New Zealand-owned company. We made a conscious decision to go with a New Zealand-based company, so where is the equity, where is the honour in the way that we're doing procurement as New Zealanders ... we need to be conscious about our procurement decisions."*

P35 *"... strongly believe the Government has a role around needing to participate, protect and grow Māori involvement, particularly in regards to Te Tiriti principles. Technology is going to be the fastest growing sector... so iwi needs to invest in technology in one way, shape or form. We want to be a party to that success and if we don't get on and if we don't start to understand and get onto that now we are going to miss the boat."*

Thinking differently

It was mentioned that often only large-scale, existing ICT businesses met the requirements of some contracts. It was noted that the current Māori network provided opportunities for a collaborative – a combination of enterprises – that could complete larger contracts if provided with the opportunity.

P45 *"The basis of Māori culture is agile, with a level hierarchy, which is also the basis of how successful technology companies operate. People have to learn how to be a scrum-masters, have to learn how to be agile, and talk to each other. It comes naturally to the Māori community, so I think that's a massive advantage. It just needs to be nurtured and encouraged".*

P51 *"A lot of government contracts are given to big businesses with large infrastructures and thousands of staff. The majority of the reasons around that is that they do that because it's safe...a big part of Māori in tech is making sure we collaborate and don't forget that others are doing similar things that perhaps we didn't know about. It'd be great to have a Māori tech-up, a national one, where we could all communicate and stuff."*

Industry Transformation Plan (ITP)

The Government’s vision for the information and technology sector is being delivered through the development and implementation of an Industry Transformation Plan (ITP). The ITP acknowledges that as a Tiriti partner, the sector needs to actively engage Māori. It recognises a te ao Māori approach can be a valuable differentiator for Aotearoa in the international arena. It also notes the Tiriti principle for Māori to “walk in two worlds”. The following analysis is structured to reflect respondents’ priorities.

Do you agree with the diagram in the ITP and the three priorities, which are:

- accelerated growth;
- strong foundations; and
- Māori participation?

A majority of respondents (**61%**) were **generally supportive of the ITP**. But the success of the plan will be dependent on the actions that are taken and the outcomes that result from those actions. A true partnership approach is required.

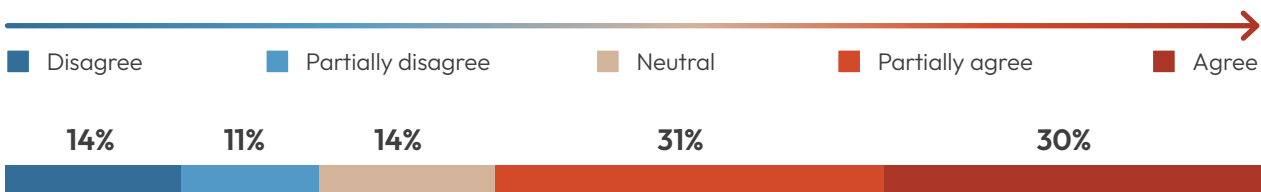


Fig. 16 - Industry Transformation Plan

R22 *“Kia pono ki te kaupapa (be authentic to the purpose), kia tika te mahi (act with integrity in terms of your commitment to Māori), and Aroha ki te tangata (showing care, respect, generosity, kindness, compassion).”*

While the respondents were in general agreement with the ITP there was some concern about the order of presentation of the priorities and the potential priorities that may be signalled from that order.

R44 *“Te Ao Māori should be the base & everything else comes from there.”*

R34 *“I guess so, but the diagram doesn’t look Māori friendly.”*

R16 *“Relieved to see Māori participation in the three! But that is not the same as ensuring the quality of that participation for Māori – should read something like: “Māori-led tech development is prioritised.”*

R28 *“As long as it supports Māori owned and controlled, or we will always be at the mercy of corporations.”*

It could be that some of the priorities need to be redefined.

R5 *“We need to stop obsessing about accelerated growth if that growth is going in the wrong direction. We need strong foundations, specifically locally owned critical cloud infrastructure, not overly relying as we do today on overseas-owned big tech.”*

R55 *“Māori participation is there. But it is a bit high level for me – what does participation mean?”*

R23 *“Ultimately tech is about process. The process in the diagram needs to be te ao Māori based, like the te aranga marae design principles.”*

A large majority of respondents (**82%**) regarded the ongoing engagement of **Māori in the tech sector as critical**. They agree that Government acknowledgement of tikanga Māori is a fundamental component of this engagement.

IR16 *“Understanding a Māori worldview – what motivates and inspires Māori (not just pan tribal but also regional) and their cultural strategic aspirations.”*

R30 *“The recognition of Māori as Māori.”*

R40 *“It’s not all deficit, we need help. Let us create our pathways and simply tautoko us.”*

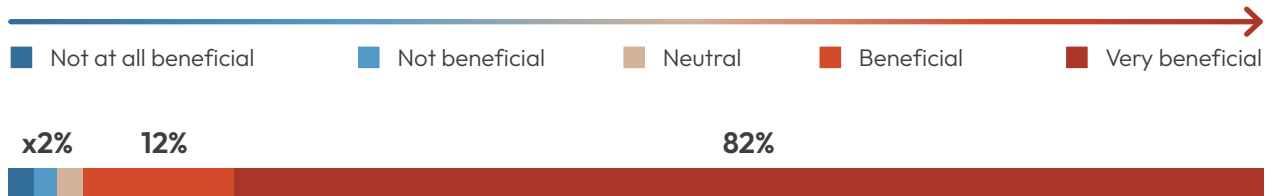


Fig. 17 - Usefulness of Māori in the tech sector

IR6 *“We are missing from the tech sector. We need more of our people working in there, as creators rather than consumers.”*

Respondents suggested multiple ways this engagement could be encouraged, for example:

IR9 *IR9 “Ability to bring a Te Ao Māori context to tech, the tech is easy; it’s the people bit that is the challenge. Enabling ownership.”*

R4 *“Access to Māori owned and managed 5G networks... What better way to get into Tech than building and managing your own community networks...Empower communities”.*

IR13 *“Provide a vehicle for Māori to express our culture, innovations, creativity and create jobs for whānau.”*

IR15 *“Growing the skill set of our people past the usual and typical job roles. Getting them to create whānau wealth (tech jobs pay very well). Creating environments where our people can flourish and grow and be inventive.”*

The majority of respondents (**86%**) acknowledge that **effective engagement by Māori** in the tech-sector **would be driven by a highly skilled workforce**. Therefore, the poor acquisition of the required skills by Māori, often based on prior educational experiences, could be a major barrier to Māori engagement.

IR14 *“Creating environments where our people can flourish and grow and be inventive.”*

IR6 *“Great leaders will make education and training programmes in the Tech sector successful for Māori. Educating our whānau to believe in themselves as well as teaching them new skills.”*



Fig. 18 - Benefits of a highly skilled Māori tech workforce

Respondents suggested ways this under-representation could be addressed for example, by creating a safe and welcoming environment.

- R21 *"Spend way more time than you think on whānaungatanga, building connections is more important in the beginning to establish trust that it is a safe place to learn, ask questions, try things, experiment".*
- R3 *"Become more effective in mapping potential pathways, esp. visually...Better articulate the gap that should be bridged now, not post-school, study, 'in the future' etc."*
- R19 *"Remove barriers to participation i.e., access to Wi-Fi, grants to buy laptops, petrol to help get to courses, pastoral care, learning support."*

A recurring theme was the provision of opportunities to acquire skills through mentorships and earn-as-you-learn internships.

- IR15 *"On the job training where they get paid to learn. Invest in companies that provide an intern program where there is a lived experience. Why? because our people learn by doing...There is nothing like on-the-job learning. Invest in Māori diverse sectors for paying interns."*
- IR18 *"Far more access to training and in regional areas. Recognize and support the existing Tech businesses that are developing Māori which are often unnoticed. Assist with scholarships for Māori who are working in IT but have not had equal opportunity to gain qualifications in the sector."*

The majority of respondents (66%) acknowledge authentic, **beneficial stories raise the profile** of the tech sector, and encourage engagement. Effective stories would inspire and encourage others to become more actively involved.

- IR7 *"Acceptance of being Māori and the value that diversity brings to innovation."*

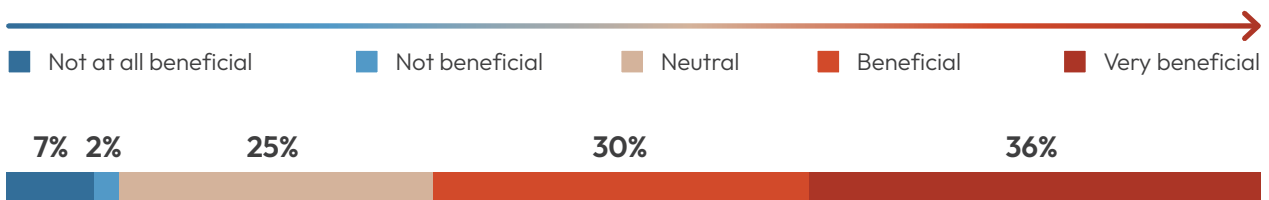


Fig. 19 - Benefit of Māori tech stories

Respondents suggested ways tech stories could become more appealing to Māori for example, by creating a safe and welcoming environment.

- R19 *"Right now the tech sector is still pretty vanilla and male and feels exclusive. I think you have to be able to see what is possible and see people who look like you are achieving in their own way."*

Success stories would inspire and motivate.

- R21 *"Share and celebrate the wins (even the small ones), it's a big deal for our people to push outside their comfort zone and pursue something different. Māori need to see all sorts of examples that look and sound like them so they know it's possible to work in Tech, no matter who you are or where you come from..."*
- IR22 *"The cultural nuance is missing and misunderstood. There needs to be more awareness and education around mātauranga Māori and its importance in a modern world."*

A majority of respondents (**73%**) acknowledge **the critical role the government** will play in encouraging and engaging Māori in the tech sector. This encouragement and engagement should be driven by a true partnership approach and not dominated by “ticking the boxes.”

IR36 *“Why are Māori seen in one separate box... the question is, how now do we add value to every sector and create new sectors that make sense to us. We should be involved in every decision-making aspect from skills attraction to exports etc.”*

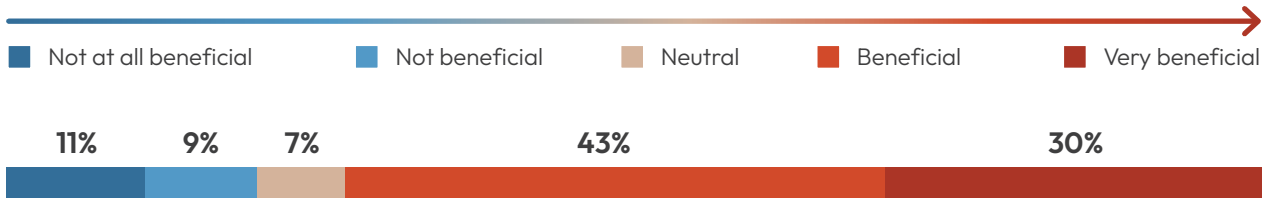


Fig. 20 - Government

This partnership approach should include all the identified workstreams.

IR36 *“As long as Māori are there in decision-making roles, and there has been iwi wide kōrero, that’s talking, listening, and implementing together some of that talked and heard korero. And some respondents.”*

R45 *“Government create an alternative Māori IT Plan that is independent, grassroots-focused and led by Māori IT leaders for whānau purposes, not Government acquiescence and neo-colonial domestication.”*

R9 *“If it’s disconnected from whānau. It seems to be another theoretical plan. The government needs to think big.”*

R25 *“Broadening the scope to be cross-industry rather than just the IT focus. i.e., taiao/environment, people/culture, everything is connected.”*

The majority of respondents (**62%**) are very **conscious of the importance of data**, the value of controlling access to data and the impact of decisions made from data analysis. Respondents agree a Māori approach to the concept of data would add value to the whole sector.

R5 *“We need to regain control and put Māori data sovereignty much higher up the agenda.”*

R20 *“Protecting our taonga.”*

R14 *“A broader recognition across the sector of Māori values and tikanga in relation to things like data sovereignty, whakapapa taonga (i.e., not just for Māori in tech, for everyone in tech). There are some industries that need to invest in data security for privacy.”*

R38 *“Mental health - the huge part when you have a tech-based business online and you are open to the public scrutiny- understanding how to navigate and pivot through those moments to continue sharing your product or service.”*



Fig. 21 - Data protection

The majority of respondents (**72%**) are very conscious of **the importance of exports to grow the tech sector** for New Zealand and the Māori-tech sectors. In fact, there are many successful international Māori companies.

R32 *“Look for Māori in technology abroad via the metaverse and Māori who don’t engage with the New Zealand Government often.”*

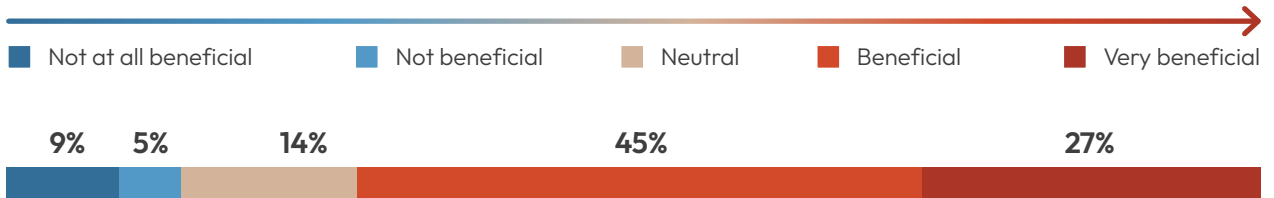


Fig. 22 - Exports

To increase engagement in the global tech sector, collaborative partnerships should be encouraged.

R15 *“Funding and mentorship from other business leaders that also want to tautoko Māori engagement into the tech sector. But these partnerships must be meaningful.”*

R45 *“It’s always about good marketing and cultural tick box exercises and those that do get in get more mahi than they should and are usually trotted out like show ponies. Our poor whānau. Then after a few years, they bounce.”*

R23 *“Pathways for non-profits, as a lot of Māori organisations are doing amazing things, including health, environment etc but have limited tech support. Because Māori will add value to exporters.”*

IR26 *“Pitch it with the real world! Underpin and associate with Te Ao Māori, demonstrate the relationship - how valuable Te Ao Māori is to the technology and how valuable technology is to tangata whenua.”*

Some respondents feel established companies need to spread their recruitment net wider and provide opportunities for all.

R16 *“Traditionally tech companies have recruited entry talent from universities. They need to look at other places to recruit - polytechnics, boot camps, open universities, etc. I think there is talent out there - but companies need to look in different places...”*

The majority of respondents (64%) are very **conscious of the potential impact of AI** in future tech developments. However, developments in AI need to align with Māori values.

R13 *“Using technology with Māori Tikanga guiding the principles of use and application. AI developments use a separate, computer-focused, language. Coders need to transition and articulate the cultural value (in its authentic form) to a bi-lingual language.”*

R37 *“There needs to be a link (in what is being described to that which is to be understood) between the two worlds and most importantly does not undervalue cultural identity.”*

IR5 *“...there is a need to show all the ways the tech sector needs us, not just that we need it! Eg we have something valuable and unique to bring, for example, I bring our values and tikanga into the AI space, in the hopes of creating AI that will reflect our values.”*

IR36 *“AI developments should be using tech to solve problems for whānau, hapū and iwi. (e.g. Lee Timutimu & the Arataki team developing their cultural trails app to capture the pūrakau of Mauao). He taonga tēnei e rapu ana i ngā kōrero o mua, hei tiaki i nga pūrakau ā ake tonu atu. He mihi tēnei mō te whenua, Ā mātou tipuna, ngā tikanga engari he taonga tuku iho mā ngā uri whatipu.”*

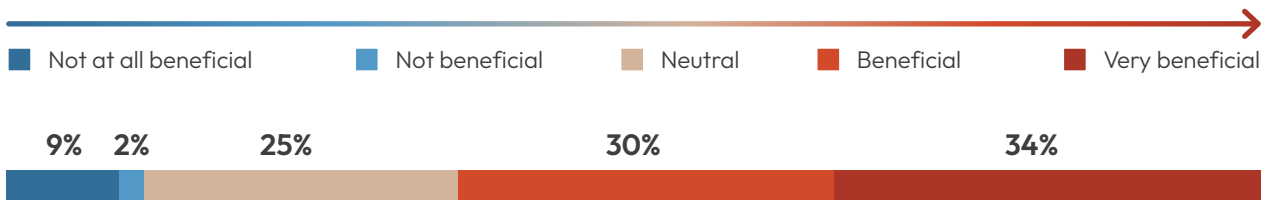


Fig. 23 - Artificial Intelligence

Despite what is a positive view of the ITP it is important to note those who were not entirely supportive of the ITP.

“This is a whole bunch of people that represent the majority who have written again a very Eurocentric document, a document that speaks about us in a certain language, and it speaks about us as pipelines and not people.”

Māori technical experts

The Māori technical experts participating in the interviews were often in charge of their own businesses or managed complex departments / organisations in commercial and business settings.

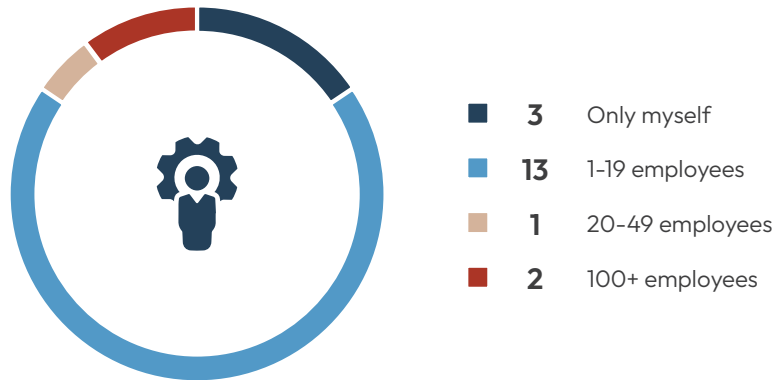


Fig. 24 - Business size

Often, they were engaged in marginalised communities, both urban and rural, and had to navigate complexities by weaving kaupapa Māori with contemporary influences. During the conversations shared conceptions and definitions emerged.

Leadership success for Māori technologists can be viewed as drawing on traditional principles, tikanga, while engaging in the interconnected world.

I20 *"The thing that defines us and differentiates us is that we go back to the source, we go back to our atua; it doesn't matter what we are doing, our atua will play an important role in what we're developing."*

I01 *"So, we're four years old as of March this year and we get a lot of requests from different organisations to present our work to talk about the way we operate the business models we've set up and the frameworks we have in place especially when it comes to our data and the way that we handle the indigenous IP side of what we're doing."*

A key issue in raising the visible profile of participants is 'whakaiti'; they do not take credit for the work completed but enable others.

P36 *"I look at myself and I'm just a little babe in this world of AI and emerging technologies, but I can sit there and hold space, so that when our next generation of people are coming through that space is held for them to take charge and to walk on through there."*

P51 *"It is important for people of similar backgrounds, similar upbringings, coming from similar regions or places to understand that perhaps what they thought wasn't possible is possible, and that there is a high level of invisibility in New Zealand around success stories."*

Access to capital and funding

Having equitable access to capital and funding was raised consistently in our interviews

“Disadvantaged from the start, from money, and relationships, New Zealand’s all about who you know not what you know and if you come from the same sort of background as me, there aren’t too many billionaires, millionaires walking out of the high school that I went to, which is how most other tech founders start raising their money. So, I think you’re behind from the start in regard to raising capital, although the flip side of that, nobody knows how to fight harder, or work around obstacles or do something with nothing, than somebody like me.”

And the reality and stress of having to bootstrap your own company as shared by another Tech entrepreneur:

“So I put everything on the line; all my savings, living off my wife’s credit card – you have to put your nuts on the line to do that kind of stuff, and that’s really, really scary. And for people who haven’t had privilege in their lives, it’s even scarier, because the number of things that can go wrong for you is higher and the opportunities you get are lower.”

The framing and intention for investment and funding also need to be addressed:

“It’s that whole mindset, capitalist-driven mindset because they are looking for money. Return on investment. That’s okay but that’s not how we roll.”

Overall there is a need to think carefully about the way funding is distributed to help established companies and organisations continue to be in a position to strengthen the work they are doing already:

“I don’t think they should be creating things that are already being done in our communities because it just makes no sense and, to be honest, we could do with that pūtea, we could do with those funding streams to continue the awesome work that we’re already doing in that space.”

The conversations still come back to the fundamental issues kaupapa Māori practitioners face which are systemic bias, racism and colonisation.

111 *“Have I also observed the oppressive systems that are at play? Absolutely. Those are harming its likelihood to succeed. Because it is a success. From its inception, it is a success because us being and us being alive is a success. I can kind of circle back to the start, what I am really struggling with is we sit within a couple of systems. We are not the owners and decision-makers of this capitalist system. How we find the balance between participating in and evolving within is my struggle.”*

Participants agreed that the rapid development of digital technologies means change is inevitable. But change should not be embraced without modification; Māori need to ensure the changes proposed are appropriate.

104 *“We never had to think about integrating. You were there, you were inside the organisation, this is how you thought, this is how you acted, this is how you behaved. We never had to think about integrating. Quite often we had to think about how to integrate Pākehā into our environment.”*

The concept of whanaungatanga is central to any success in introducing technologies and is mentioned in many of the conversations. Relationships with current, future, and past generations – intergenerational – drive many Māori technologists in their activities.

131 *"We have people who prefer to deal with people that are nice to them and actually care about the work that they're doing, or the service that they're providing, and aren't leaving them alone. Some stuff is like, "I've done my job, washed my hands. I've done what you asked me to do, now you're on your own." It's like, "Eh", that can be jarring for people. Where is the aroha? "*

Whaiwhakaaroto translates as "be thoughtful, considerate, attentive, mindful of the communities' needs would ensure initiatives would get buy-in/acceptance."

121 *"...it's about giving back to the people. Using a service or product to give back to the people. That's my experience as well working with other Māori and other indigenous from other countries. Most of the business is about giving back and helping whānau and things like that."*

Māori Innovation in three areas were mentioned in depth, Taiao (environmental sustainability), Hauora/Oranga (health and well-being) and Mātauranga (Māori knowledge).

"All these strategies - Māori strategies, Pacific strategies, are written up to try and make this thing that doesn't work in the first place here work ... mine has always been, we've got all the mātauranga here."

"We could consider the deeper links into our own ancestral Māori knowledge systems as a guiding influence with technology and the construction of IT artefacts - especially when dealing with Universities!"

"Māori digital entrepreneurs are trying to look after each other, either trying to improve the world through their mahi and make a difference in the world environmentally and socially, or they are doing whatever they can using whatever their gifts or passions are, to be able to generate some money to be able to support their whānau".

Or individuals commented on policies they would implement.

111 *"Are these being built from the communities themselves? The irony of this is that everyone works in tech and they talk about user-centred design.... This is an example of user-centred design that needs people to hire and has talked about communities from a pipeline point of view."*

Participants noted the long history of the contribution of Māori to the implementation of technologies in multiple value-added ways.

103 *"...you know the inspiration for that has come through me learning about how our ancestors saw things like ownership and how they viewed assets as being something that everyone had a role in protecting and growing and nurturing."*

Or that the Eurocentric technological approach was the 'sum of all knowledge' or the only direction to the future, indigenous approaches should also be valued and acknowledged.

131 *"'Value' is a very interesting topic. There's a very big difference between a value and values. Value is obviously what people perceive as money in a lot of senses, but values that are actually quite often the opposite of money."*

130 *"Māori entrepreneurship for me is the social enterprise element to it. It has a different culture, it's not about, 'Oh, we're trying to make money, we've gotta get rich. I want a new Ferrari'. They're trying to get a new Ferrari, none for my whānau! They're trying to look after each other, they're always either trying to improve the world through their mahi... to be able to generate some money to be able to support their whānau."*

Challenge Consumerism: Respondents feel the current tech ecosystem needs to be reshaped to reflect Māori worldviews and aspirations.

- IR6 *"Technology based on mātauranga Māori, including elements like reo Māori, whakapapa, tikanga."*
- IR10 *"The tech space, where the decisions of what, how, and where the affordances are applied from Māori groundings."*
- IR13 *"Using technology with Māori Tikanga guiding the principles of use and application. This will then lead to Māori re-shaping the building blocks to meet their identified needs."*
- IR30 *"Also, I feel our people need to upskill in tech - the parents of our rangatahi need to start using tech, not have tech use us! We have the highest statistics in NZ for all social channels, and so, this points out that we're using a lot of our time to "watch" content. At the same time, we're more than capable of "creating" amazing content that can be watched."*
- R4 *"One thing I am passionate about is building a locally owned cloud industry. Not just data centres for US-owned clouds (they are just big fridges full of computers) but the whole thing from the ground up, providing rich and varied opportunities to learn skills and build careers for all out there!"*

Māori need to be active in the tech ecosystem demonstrating the value they bring to the sector that is often ignored.

- IR23 *"Pitch it with the real world! Underpin and associate with Te Ao Māori, demonstrate the relationship - how valuable Te Ao Māori is to the technology and how valuable technology is to tangata whenua. This vision of the potential missed opportunity needs to be shared by all the whānau."*
- IR18 *"For my moko, yes. I have tried to encourage them as they are all quite savvy with the social media apps but talking about coding etc....they sort of switch off. There is a need to challenge the dependence on international external experts rather than providing opportunities for Māori."*
- IR3 *"If you compare ourselves to India, India has pushed a lot of their people through Tech, and so, I find a lot more from India taking Senior positions here in Aotearoa."*

Māori need to add their voice to the tech sector.

- IR30 *"Upbringing has a lot to do with "speaking up" as we're mostly always told not to talk back to our parents and elders, however, when you want a senior or leadership position, you need to speak up. Teaching our kids to "speak up" will help them in their career. Funding should be provided for leadership initiatives."*
- R1 *"Perhaps a working group, mentorship, or network (i.e., Te Matarau) that has a fund available to financially support the mahi done by a network of leaders, experts and mentors in this space to do this mahi. Telling stories will provide inspiration."*
- R8 *"Showcase tech industry and opportunities. There is amazing stuff going on out there and youth are the drivers of a lot of change."*

Outcomes for Māori in the tech sector should include the benefits to the community, not just the industry.

- R2 *"A more coordinated connection with global networks... we continue to think largely from an industry-led versus community-centric approach...It is not all about the new shiny things, it is also about the existing and continuous improvements to existing processes and delivery."*

A clear plan of how to continually engage Māori in the Tech-industry is urgently required.

- R2 *"Greater emphasis on transition space between education and workforce, meaning more presence and engagement needed at earlier ages (Year 10 minimum)."*
- R1 *"You can't be what you can't see so let's show our Rangatahi that there are tools and resources out there to enable you to work in tech from anywhere in the world whether you're at home in Te Tai Tokerau, in Wellington City or Otepoti. Support them to train, learn and work from their corner of the world."*
- R30 *"All those already in the tech sector need to be a lot more visible, vocal, and accessible. The sector needs to be a lot more inclusive to Māori, not just as a people, but as a culture conducive to our way of being."*

Māori Networks need to be built and maintained.

- IR22 *"I'm no authority on the topic but currently, I see it as a collection of businesses in the tech space that share Māori kupu, information, products, services and so on in a way that's authentically Māori. What I would like it to become is a way of thinking that is interwoven through all technology, consulting, design, and development stages. Success stories need to be shared to encourage the building of connections."*
- R30 *"More heroes and exposing those heroes. I've worked with a number of Māori in tech that go unnoticed and don't speak up because we're too humble. If our rangatahi knew about these people, they would see that there are successful pathways that can be made, and so will encourage more rangatahi to get involved. To ensure these networks are sustainable."*
- R20 *"Community build, network build, mentorship, bring other cultures along to increase the breadth of casual networks."*

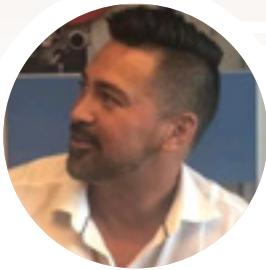
Education is a key to success but the way they are delivered needs to be evaluated.

- IR33 *"The way that training programmes are delivered and how they are delivered. They need to engage whānau in a Māori Tikanga way. Introductions, whānaungatanga is important for a start, equitable access to education, regardless of location is fundamental"*
- IR19 *"Far more access to training and in regional areas. Recognise and support the existing Tech businesses that are developing by Māori which are often unnoticed. Assist with scholarships for Māori who are working in IT but have not had equal opportunity to gain qualifications in the sector. Existing educational services do not meet Māori needs."*
- R7 *"Could acknowledge that it has entrenched and enabled a racist education system. Maybe Māori only classes? classes i te reo Māori. The provision of educational opportunities from some providers needs to be challenged."*
- R33 *"We are all in the same waka and our fear is that outsiders will be signed up, get paid government contracts, do a shit job, tell the government why they did a shit job and still get more money next time rolling out the same failures"*

We acknowledge and thank each of our interviewees for sharing their insights and whakaaro with our team, we look forward to sharing all of the interviews via our website www.mea.nz

CASE STUDY INTERVIEWS

CASE STUDY INTERVIEW 1: NNMD



Nikora Ngaropo

MOTION AND DESIGN
Edu Tech

Nikora is of Ngāi Tūhoe and Te Rarawa descent and established NNMD in 2016 to provide digital consultation, motion and design services in the education and the commercial markets. Nikora's team has a combined 25+ years of experience spanning creative roles, community-based services and education.

NNMD understands that good ideas, empathy and genuine connection with people is at the heart of everything they do. Their work is enabled by a mixture of intuition, experience and communication, and merges skills in motion graphics, design and 3D animation to produce design-driven solutions. Nikora's vision is "influencing the future of Aotearoa through creativity, education, culture and commerce."

What does Māori technology mean to you?

"In the wider sense I think Māori technology relates to any technology that's been used from 'i te tīmatanga mai ki te kore,' so from the beginning to now. That's anything from celestial navigation and seafaring, traversing the oceans right up to what we're doing which is in the digital and industrial spaces. I think it's a very wide term so when we think about technology, a pencil is technology, it just depends at what end of that curve you're looking at. Part of what we do with our mahi is looking at some of those higher-end principles and concepts and we try and break them down into a really accessible format so that when we're talking about technology, it's not just at that high summary level that only a few people can partake in."

What is your definition of a Māori digital entrepreneur?

For Nikora, the definition of a Māori digital entrepreneur would be somebody 'who has whakapapa Māori but also has Māori values, connections into their community and are working from a place that is not just about income.' He says there has to be a bigger picture or a larger story and most of the time people are talking about intergenerational plans of wealth around this.

Technology is a vehicle for that, 'but we're also talking about how we get to the front of that curve in terms of pushing Māori and Māori-thought leadership to the front of that space.' For him a Māori entrepreneur is someone who holds those kinds of values as a foundation. "In their Māoritanga they know who they are at the most basic level, they're able to connect with Māori and there are many of us who have been on that journey where they may not have grown up in a Māori environment and that's why I say that it comes down to Māori values. So you don't necessarily need to have the reo, though that's also important, but it is around those foundational values and the way you are doing business."

What are the barriers to the engagement of younger Māori in the tech sector?

Nikora thinks it comes to exposure and having role models in the space. He says that historically there have been Māori moving into these areas, 'but they've been few and far between so the ability to see yourself within that environment, it actually makes a big difference.' For a lot of tamāriki and rangatahi, 'you don't know what you don't know, and you can't see yourself in those spaces unless there's someone there who looks like you.' He says from that kind of lens the role modelling part is a big thing, and being able to articulate the learning into manageable and accessible formats that resonate.

What do you think about apprenticeships within the Tech industry?

According to Nikora, the learning gained in tertiary is very different from what is applied when working. "It's great to go to university and be studying because you haven't the freedom to be creative, to try different ideas, to try theories, but they are theories so unless you're putting those theories into practice and applying them you actually don't know or have the background to say, 'yes, this works.' In a business scenario, you're going with what works, what's applicable and what's most efficient so you throw away all the dead weight. I do think the trade-to-trade is a great way to go. It is the way that you can upskill people on the way but it's draining, it's intensive, the amount of human resources that you need to prop that up is considerable ... a lot of the time it's a gamble and you're hoping you're picking the right person for the job but there's no guarantee.'

Have you heard of the Industry Transformation Plan?

Nikora has been involved with helping write and articulate the Industry Transformation Plan. He says it's a little late, but it's great. "I think it'll be really good once it's in play and moving. The other thing is that mapping out the ecosystem is quite hard as well, and you need to see where all the pieces are fitting. So when we talk about the Māori tech ecosystem you've got education issues, you've got businesses, you've got tertiary. There are lots of moving parts."

While he says the Industry Transformation Plan has been a long time coming, he thinks it could take a long time to implement as well. "What I think is they probably need to choose a few forerunners whom they can poster child those particular companies, and they need to be successful, and they need to run, and they need to grow rapidly to basically give wider Aotearoa confidence in what the plan is doing. And then from there, you can probably build out a few of the niches and just have that waterfall kind of trickle effect ... I'm looking at where the Māori economy sits, and because the Māori economy has money we're seeing a lot of things change quite drastically. The voice that Māori have now is very different to the voice they had 20 years ago."

What do you think of innovation hubs and the way they're run and the way they are organised at the moment?

Nikora thinks there are some good ones, 'and there are some not-so-good ones.' He says most of the time we only see the successes. "You do need to fail fast in business. The problem that we have when we're talking about Government is the Government can't afford to fail. Creating those spaces where you are able to pilot, fail and learn and iterate is super important. You get that in the digital space a lot. That's a development mentality in terms of iterating and upgrading. We do that in our programmes all the time so if we're doing any new kind of teaching methodology or even just work in practice we're constantly reviewing, iterating and creating new efficiencies. If it's not working it's gone, kind of thing. It is learning from those mistakes and moving forward with what is working."

Do you think Māori have advantages in being successful in the international market in the way that they're able to pull together networks so quickly?

In Nikora's opinion, it comes down to community. He provides tangi as an example, 'you have a kaupapa where everyone pulls together to make something happen and you're able to pull and draw on resources.' He says the reason he uses that example is because it happens all the time, 'it happens at the drop of a hat so you're able to mobilise a community of people very, very quickly as well around the kaupapa. That is a little bit different to business, but the same sorts of ideas and principles still come into play. So when you're talking about mobilising for a kaupapa the relationships that you have become very important, so the strength of those relationships determines whether or not you are able to pull together the necessary human resource and resources that you need to articulate that vision. So two different kaupapa but with the same kind of ideas.'

In regards to companies expanding internationally, he says the people involved in that market or place they are looking to go into may not be Māori, 'and so the strength of those relationships also comes into play.'

"How strong are those relationships? Can you call on them? Because you can't call on everybody. In the business world, there are probably only a handful of people that you could probably call on that would be able to mobilise resources to help you, and you don't just want to be mobilising business resources, you want to be mobilising political resources behind you. Who's writing the letters to open up doorways and points of entry into a new market? There are lots of things that kind of need to come into play. I do think onshore back at home we're really good at doing the business back at home, we're really good at making small kaupapa big, kaupapa happen, it's a little bit different when we try to do very large stuff because there are far more moving parts."

He says when money comes into the equation it changes things again.

"Being able to scale that global business, you really do need to have a well-oiled machine that has really good processes as well, and that's processes in terms of how you gather your people, how you're gathering those relationships, how you're communicating together, is all of that information trickling down the waterfall to the people who need it as well."

Do you think Māori have advantages in being successful in the international market in the way that they're able to pull together networks so quickly?

Nikora says currently he is seeing a lot of people making decisions for communities that are not based in the community or don't have their fingers on the pulse in those communities or they may have had their time in the community, they haven't maintained those relationships and may not have an overview which is relevant to today. "I think one of the things I would really like to see, especially in a digital governance space, is making sure that the people that we have here are actually in their communities and know what their people want. I see a lot of high-flying people who I know do not work in the communities who are making decisions on their behalf. There is a real need to maintain those connections and to make sure that you are across what your communities need."

He thinks it is very easy to move away from that when moving into a digital governance space and says a lot of people in governance positions do not have connections into their communities on a regular level where they know what's going on. "I advise Ministers at this end, but I still do work with kids down at the centre as well and it's really important that I do that to make sure that what I'm saying up here is relevant to the people that I'm seeing down here. So that at least I'm across what's happening in my own communities."

CASE STUDY INTERVIEW 2: **ARA Journeys**



Amber Taylor

ARA JOURNEYS

Ngāti Whātua, Ngāpuhi, me Te Rarawa

ARA Journeys is an award-winning digital technologies company with storytelling platforms that combine augmented (AR), virtual (VR), mixed (MR) realities and artificial intelligence (AI) to bring history to life through gamified experiences that promote connection, education, and exploration. Ara works with Indigenous peoples, community organisations, schools, and businesses around the world to help connect people to culturally significant sites and preserve Indigenous knowledge and stories for future generations. Their mahi spans education, environment, health & well-being, tourism and information technology.

What is your understanding of Māori digital entrepreneurship and/or digital entrepreneurs?

Amber says ‘the way we operate and undertake business is different: our values, our business models, how we rate ourselves as Māori entrepreneurs in that digital tech space; it’s not the same as how other digital entrepreneurs operate or act. If we’re talking in terms of definitions, the definition is the way we structure our days and structure our companies and how we look after our team members and our communities, that’s where things are different.’

She says one of the first things she and Dr Isaac Warbrick, co-founder of ARA Journeys, did was make sure that how they operated, positioned and brought the company to life from a Te Ao Māori lens. “We’re 100 percent Māori owned; Isaac and I are the only shareholders in that company and currently all my staff are Māori.” “It’s definitely a point of difference. We haven’t done an investment raise or appointed external investors, we can hand to heart stand up and say we’re 100 percent Māori owned. There are no other influences or other people putting pressure on us to make decisions that don’t align with our values and the missions that we’ve set up for our company so it’s definitely a point of difference. In the Western traditional tech networks and circles and even across some of our Māori tech networks and communities some of them have raised investments or they have other shareholders and external influences associated with their companies that could be influencing some of their decision-making. Whereas we can stand up and be the only decision-makers for our company. When we work with iwi or when we’re engaging with our different Māori communities, I think for us, it’s been a lot easier to build relationships and navigate in that space because we don’t have anyone else coming in who could be looking to take IP from us, or could really misuse some of the information that we’re given to use within our platforms.”

What do you think the Government should do to encourage Māori entrepreneurship in the digital space?

"We need more Māori on those boards that are making the decisions on where funding is going. I'm not talking about just academics, there needs to be industry representation there as well. One of the struggles that we have all the time is getting Government organisations to understand, like really understand the way that we operate as a business where we judge ourselves and our value on the impact that we're having in communities."

What do you think the barriers are to companies operating in your way?

According to Amber, there is a lack of support in terms of funding from the Government. Furthermore, she says tech moves phenomenally fast, she says for her company they always benchmark everything that they're going to build based on what's happening internationally and what they're predicting for the next 20 years, 'so rather than going oh yeah this is hot now, we're looking at what international companies are planning for the future, and how we can futureproof our platforms as well as work out what future tech we want to incorporate now.' She says that's the only way they're going to be able to stay ahead of the game if they want to be change-makers and game-makers in the sector.

How can rangatahi become involved in this growing sector?

Amber, who grew up in South Auckland, says she has gone into schools, 'and they [event organisers] put these big flashy buzz words in front of them and all these bright lights and these kids just want to know what can I do now, how can I make some money to contribute to my family and how can I do this in a time that's suitable for me because I've got a million other things that I need to do, that I'm committed to doing - whether that be sport, whānau, part-time job or whatever.'

"I think there's value in actually having real people go into these schools and speak with these students and be like, you know what, you can do this, and if you do this animation thing why don't you think about selling some of your characters. Having a realistic option available, rather than pushing traditional educational frameworks 'do this diploma then sign up for this degree then five years down the track you can get a job and contribute to your whānau.'"

Furthermore, she says we need more Māori in tech, 'but STOP selling the idea based on the current hype of the tech sector, big flashy lights, buzz words and all the cool tech robots and Star Wars games. Show our rangatahi how they can get involved now. The valuable, readily attainable skills they can actually go out and use now.'

CASE STUDY INTERVIEW 3: **Arataki**



Lee Timutimu

ARATAKI

Ngāti Awa, Ngāi Te Rangi, Tūhoe, Ngāti Porou

Arataki Systems was founded in 2016 and builds digital storytelling platforms that connect people with Māori and their own culture. Their goal is to bridge the cultural gap between communities and their mission is to share 1 million stories. Lee is also the founder of Te Matarau a connection platform for Māori Tech practitioners and co founder of Te Hāpori Matihiko another platform designed to share opportunities and to celebrate Māori in tech.

What is your background and journey in Māori tech?

Lee has been working in tech for over 20 years, and the last five and a half years of that as a business owner (at the time of interview). He also founded Te Matarau, the Māori Tech Association, an initiative he viewed as a necessity.

"I seem to be a little bit of a conduit at the moment, an intermediary if you will, around externals trying to engage with this community right."

What are your conceptions around Māori in technology or Māori entrepreneurship or Māori digital entrepreneurship?

Lee 'pretty much lives and breathes it,' and says he has been privileged to see many parts of the community. "I'll call it a community, you can call it a tech sector or we can call it whatever, but for me, it's a community that's very active and vibrant, and I'm just so very fortunate to be connected in so many ways.

In his opinion, 'Māori in tech is a state of being, it's a cultural belief, it's a cultural value, it's our perspective of technology in general, it's our Māori world view, it's us being awesome in our Māoriness, albeit Māori being our superpower.' He says for him, it's not so much about what technology is in terms of its physicality, 'because you know technology can come in many shapes and forms, it's more about who we are and how we see ourselves within that realm, I guess.' He sees 'our point of difference, and what makes us (Māori) different to every other technologist in New Zealand let alone the world, is I see our culture being the difference. That's the thing that will solve a lot of global problems, it's the thing, the indigenous worldview and how we apply it to an enabler like technology is the thing that's going to help us solve a lot of problems.

What do you think causes low engagement of Māori in tech?

According to Lee one barrier is lack of education, 'our people don't know what it is, what it looks like and what the potential could be if our children or our youth were to pursue a pathway into technology.' He says the whānau themselves don't understand what that means and what it looks like, so there's nothing tangible that they can connect to that will make them realise the potential opportunities that await their children and grandchildren in that space.

What do you think causes low engagement of Māori in tech?

He explains that mainstream education is streaming children into certain pathways and certain subject matter 'which unfortunately does not include stem subjects.' "That's a big problem because already we're setting our kids off on a pathway that doesn't involve them looking into tech and innovation and the stem subjects to support them on that journey." He also says families need to be inspired as it's the families that have to support these young people on that journey.

What is your opinion of the Industry Transformation Plan?

For Lee, one of the reasons he started Te Matarau was because as a Māori tech entrepreneur, he didn't feel that NZ Tech represented him as a Māori tech entrepreneur, so he went off and tried to create something he thought would better reflect his cultural values, beliefs and philosophies. He thinks it is important for himself and others that are members of the Māori tech community to be at the table to ensure and hold them (MBIE) accountable and keep them honest, because if we don't then what could happen - and it's happened before - is they'll design something that they think will be good for us but it will turn out that it won't be good for us.' "It's really just around better engagement or more effective engagement with the community that you're looking to serve ... I think it goes some way to articulate some of the challenges that we face as Māori in the tech and innovation space, but I think there could be more mahi done, and I actually think the majority of that mahi, if not all of it, should be led by Māori because that's just the way it should be." He says as long as they're engaging with more Māori tech practitioners that are actually working in the system and working in the sector, 'then I think that's a good thing.'

"Hopefully it will be really good for us to understand who's doing what and what's happening where."

Do you think it is a unique business advantage how Māori shape technology to meet their needs, and that that could lead the world in shaping how other indigenous communities can shape technology to meet their particular needs?

Lee thinks that as indigenous people, Māori have led the way in many ways, citing language as an example.

"A lot of other indigenous peoples around the world have looked to us as a reference point, and you've got the Hawaiians that have pretty much adopted the language nest concept, so kōhanga reo, to help to revive their language and I think the same can be applied to technology, 100 percent, absolutely."

He says for all the challenges that Māori face living within New Zealand today, particularly with working with the government, 'we're really quite fortunate actually,' as the Government provides funding to help Māori create initiatives or solutions that will serve the Māori community, 'and if it's good for Māori communities, it will certainly be good for indigenous communities.'

He says if Māori in tech is working for the betterment of their communities, then that same business model can be applied to other indigenous people.

"That's where I'm at ... that's my commitment to other indigenous people around the globe, and it's really just supporting our people that we know pretty much have been through the same colonisation process as we have, understanding the challenges that they have currently and their past, and really just supporting them to get to where they want to a lot faster where technology and innovation is the enabler."

If you had the opportunity to suggest one road map going forward, what would that be?

In Lee's opinion, it's important for NZTech and the Government to understand what is currently going on within the Māori tech ecosystem because then they are less likely to go off and replicate what is already being done, 'and we don't want that to happen because we're already scrapping for the breadcrumbs in terms of pūtea.'

"I think NZTech needs to take more responsibility for what they create and what they fund specifically for our Māori and Pacific communities. I don't think they should be creating things that are already being done in our communities because it just makes no sense and, to be honest, we could do with that pūtea, we could do with those funding streams to continue the awesome work that we're already doing in that space."

Do you think funding is provided on a short-term vision as opposed to long-term and is there enough follow-up support?

Lee feels with a short-term vision it's much easier for the Government 'to just do stuff without engaging, without the whole process of engaging the community, visibility and that kind of jazz.' He says they'll just do something to get it pushed through, check the box, get the people in, all the metrics. He thinks this happens a lot, and that potentially could be due to the short-term vision of the funding streams but also the objectives they may need to fulfil within a financial year. He believes this could be easily solved with a better-coordinated effort around engaging with the community, 'like literally, we've got a list, a database of initiatives and service providers - all they need to do is send an email, like literally and say, 'hey we've got this funding that's come available from DIA, this is the objective, they're trying to connect with Māori and Pacific communities, what can you do?' And we'll be like 'mate, we can do whatever you want us to do, 'cause look, we're already doing that.'

"Maybe they can just do a little bit better in that space around engaging."

Lee concludes that another thing that makes Māori tech different is 'the way we look at the next generation and the next, next generation.'

"It's not about now, it's about what's coming, it's about what can we create now that will create that intergenerational impact."

CASE STUDY INTERVIEW 4: Māui Productions



Vincent Egan

MĀUI PRODUCTIONS

Ngāruahine, Ngāti Ruanui, Ngāti Tū

Taking Te Ao Māori imagination from the mind to the world. Māui Studios is a kaupapa Māori production studio that develops end to end digital content solutions grounded in matauranga Māori, tikanga and tipuna values for local and global audiences.

What is your definition of Māori technology?

Vincent thinks Māori technology is ‘essentially tools and devices that Māori developed to be able to make our lives easier, things we could use to achieve specific goals.’

“Technology was never just a modern concept, it’s something that has been with our people since the dawn of time. It’s essentially what we would use, develop, create and share with others to make our lives more efficient, make our jobs easier, and to communicate certain ideas. They’re an extension of ourselves I suppose, whether it’s our physical hands and what our hands or bodies can do, but also an extension of our minds, of our voices, of our ability to hear things, an extension of our senses.”

He says when it comes to what a technological thing is, ‘something that is separate from ourselves that we’ve manifested or created and it’s something that we use to extend upon ourselves.’

Why do you think there is a poor uptake by Māori and Pasifika in the tertiary technology space?

One of the reasons Vincent thinks that is occurring is because of how education is being portrayed or viewed.

“If you look at a lot of tohu that represent different tertiary organisations they are shields, they’re coats of arms, and for Māori that have grown up with our symbology and toi Māori and the way that we express ourselves creatively, the shield is not a technology that we have ever used or been familiar with so a lot of our education system is skinned with these shields and symbology that we can’t relate to easily.”

In Vincent’s view, there is room to work on how tertiary-level education or higher education is portrayed and communicated to Māori and Pasifika.

Do you know of any educational offerings anywhere that are encouraging Māori involvement?

Vincent names Toihoukura in terms of Māori artist streams and Te Wānanga o Aotearoa as examples. “I know that tertiary level education providers are beginning to make more of an effort and there are some shifts in how those organisations are communicated.” He encountered a ‘unique surprise’ when he was studying at Otago Polytechnic, not traditionally a Māori space with very few Māori students involved with their courses.

"I was one of four, I believe in the entire cohort for our year, but what I really appreciated was they were really accommodating to the sorts of creative projects that were specific to Māori. And they did one thing, they encouraged each of us Māori creative practitioners to come together and to work on kaupapa Māori projects together and even created spaces where we could go and work on those projects and be a little more immersed in our own culture. Those things definitely made a real difference."

What would your thoughts be on a Māori apprenticeship scheme?

Vincent supports this concept, describing it as 'fantastic.'

"It mirrors the tuakana-teina relationship we know works for sibling organisations; Māori organisations that we've worked alongside."

He says they have similar programmes at Māui studios when it comes to putting in internships. Junior staff sit with senior staff and work closely on projects.

"Our tuakana are taking their teina into meetings, demonstrating how to communicate effectively, demonstrating how to use the technology - what are some shortcuts, what are some ways to be able to solve problems with Google and the internet, and just for our teina to be able to see and hear and get a real-world viewpoint of how things should be done, is a hugely meaningful thing and we've done that in our villages since the beginning of time as well, and it worked back then and we know it works now."

Do you have any suggestions that you would ask the Government to implement?

To Vincent, the obvious one would be to create more funding opportunities, 'but there is so much bureaucracy and paperwork, like even just applying for funds, in my viewpoint, can be a real waste of time - because heaps of people are putting in so much effort and energy to be able to access all this funding and then, like 80 percent of the applications that are put in, receive a massive no; and all that hard work that people put in disappears into the ether.'

He says when it comes to policy, what has worked in the past was having access to individuals that can create meaningful teaching and learning environments and networks.

"When it comes to support, and Government organisations its good to have an eternal tuakana - someone we can always continue to talk to that has the viewpoint from within Government and what's happening and connection to all these different initiatives, of funds or opportunities, being able to relay that information in a way that is digestible and easier to access without it coming across as spammy."

While working with Te Puni Kokiri (TPK), he says they have had one of their tuakana doing a needs assessment with them, 'it was just basically being able to access public servants and being able to sit down with the knowledgeable people, and utilising their time for them do an assessment of where we currently were, how things could improve, so real tangible outcomes and action points that we can use that would come as a result of that solid dialogue. Having more of those sorts of opportunities works.'

Sometimes companies are doing something for one department, and other Government departments don't even know they exist. What are your thoughts?

Vincent says Māui studios have worked with TPK for a number of years, so conversing with people who know an organisation's whakapapa makes it a lot easier.

"Maybe when it comes to the policy side of things I don't really see too much of this happening within Government, but, staff that have worked there for a lot of years, the attrition rate for Government organisations is pretty poor. Working with the Ministry of Education we are always, sometimes only within a few months, working with a different key contact person because it's either too stressful, they are not being looked after on their side, or they have moved along to the next opportunity. But maybe if there is a way for those public servants to be working with a Government organisation for a lot longer, it could be something that is meaningful to organisations like ours, and even younger ones, or students."

Do you think there is added value by being a Māori company? What differentiates a Māori entrepreneurial company?

In regards to working with clients, Vincent says it's all built upon whakawhānaungatanga and building long-lasting relationships that are of mutual benefit over a long time. His organisation thinks multi-generationally, and he says tikanga practices are imperative.

"We allocate a significant amount of time for whakawhānaungatanga – getting to know. If it's a creative project then we like to go to the space where the mana whenua are situated and get to know all the relevant players, all the kaumātua, the cultural leaders, the tamariki. If it's a creative outcome, then it's working with their descendants and their creatives within that organisation and spending that significant amount of time getting to know one another."

Tikanga practices are:

"The concept that you are allowed to fail, but learn from your failure does not seem to be promoted. Life goes on as an entrepreneur because the group around you will support you. If you have a good group around you to support you, failure actually becomes a success story"

Vincent believes failure can be a necessary step to achieving success and people should change their relationship about what failure means to them.

"It's not so much a thing to be held back or something that they stop themselves doing but instead it should be something that they are pushing to do as often as they can." He says obviously people should not self-sabotage, 'but putting themselves in enough discomfort so that they are in a place where they are likely to fail but learn a valuable lesson from it, and it's often those failures that give us the kick up the butt that we need to push a little bit harder or give us a dose of reality, so that we know, 'oh yes, ok that didn't feel too good what are some things to put in place so that it doesn't happen again.' So I don't think it's like okay to fail, I think it's more like we need to fail in order to achieve the success that we feel that we're worthy of."

CASE STUDY INTERVIEW 5: **Āhau**



Ben Tairea

ĀHAU

Whānau Data Platform, Whakapapa protection

Āhau is a Whānau Data Platform that helps whānau-based communities (whānau, hapū, iwi) capture, preserve, and share important information and histories into secure, whānau-managed databases and servers. It provides whakapapa records and maintains tribal registries.

He is a software developer and has been involved in small business development alongside being the co-founder of Āhau. He says he found something he was passionate about, which was building tools that would help him learn who he was and where he came from.

What is your understanding of Māori digital entrepreneurship?

According to Ben, there are a number of factors including how Māori operate as entrepreneurs and the definition of what Māori entrepreneurship is and what it looks like. Additionally, when considering the ecosystem: what it is and what other businesses are doing. What brings digital and Māori entrepreneurship together is the social enterprise element to it, Ben says it “has a different culture, Māori digital entrepreneurs are trying to look after each other, either trying to improve the world through their mahi and make a difference in the world environmentally socially, or they are doing whatever they can using whatever their gifts or passions are, to be able to generate some money to be able to support their whānau.

What is your thinking around Māori values and practices? Do they influence the way you might operate your business?

Māori values and practices have a huge influence on the operation of Āhau, from the way that they talk about what they do, how they build business models and their ways of interacting with people. He thinks the vocabulary used is of utmost importance and has an impact. The people they hire are an important decision as well as the people that they work with and the relationships they build. In his opinion, this offers a real opportunity that a lot of Western businesses could get a lot of value out of.

Ben firmly believes integrating Māori values and practices offers a competitive edge, not perhaps in the way in which a competitive edge might be viewed from a standard business model. He says it may not make them more money, but that is not what they are trying to do with the businesses. While they want the business to be sustainable, they would take a loss if it meant that they could help somebody that was in need.

In his view, therein lies the competitive edge: having trust in their community. Ben says they have people that will come to them who prefer to deal with people that are nice to them and actually care about the work that they’re doing, or the service that they’re providing, and who aren’t leaving them alone. That narrative isn’t lost on people and people remember that.

How important is the provision of mentorship, or education and training to grow Māori digital entrepreneurship?

According to Ben, it is hugely important and not enough is currently being done. He believes there is real power in having somebody to talk to, at whatever stage you're in, just knowing somebody. A tuākana/teina relationship is pivotal and Ben says he has tried to mimic that role for others. He says you can't be what you can't see. In addition, he thinks the Māori entrepreneurial technology community could do more in terms of support and creating pathways, saying there are some industrial-minded rangatahi out there who know how to make some money. While they know how to think about it in that way, he says it is the execution of it where it gets hard.

Do you feel that Māori enterprises might face some difficulty in the international market?

Ben believes there could be some difficulty in the international market, citing mentorship as a reason. While he would love his company to go global, he questions who they would talk to. He doesn't know of other Māori businesses that have had that experience and can provide that mentorship. While he is sure there are a lot of Western businesses and Europeans that they could lean on for that, it is not the same. He thinks there is a huge gap in that space and lists that as one of the main reasons why we haven't seen a lot of Māori digital solutions go global.

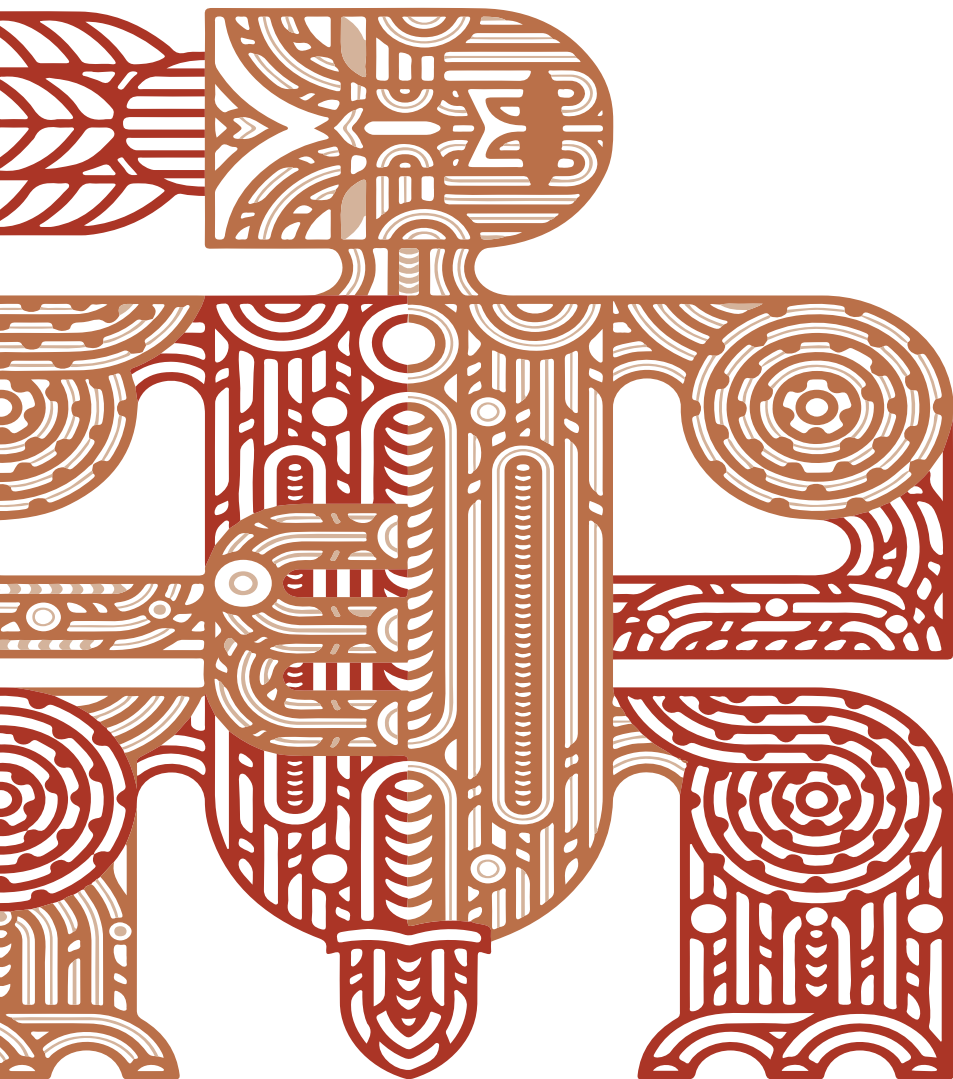
In your opinion what are the most important factors or obstacles that limit the growth of our people and our own Māori entrepreneurship in New Zealand?

Ben says there is still a large percentage of the population without a device and access to technology. He questions how we are meant to grow strong Māori technology businesses when there are still kids growing up without computers. There are still rural schools out there that don't have a technology programme because there aren't technology teachers and Ben says the Crown doesn't recognise that it is a valuable investment to have somebody that can kōrero Māori to go through Teaching School. He doesn't think that they see that they could train up 30 kids that could be really technology proficient and that one out of ten of those could be entrepreneurs that will start businesses. He says there's a lot of talking about it and a lot of inequality and investing is vital. He believes it's still a big problem - not enough training and not enough connection. He says there are no developers in a rural community that doesn't have internet. There are no technology entrepreneurs in a community that doesn't have internet. So, number one - get people access, number two - train, then number three - support.

Tawhiti rawa tā tātou
haerenga te kore haere tonu

We have done too much to not do more,
we have come too far to not go further

– Tā James Henare



CONCLUSION

Since the inception of the tech sector and the introduction of the Internet in New Zealand, Māori have not been resourced or supported to participate fully as partners within the industry. We had accounts shared of a tokenistic approach to engagement, a lack of engagement or inclusion and Te Tiriti awareness and application were either non-existent or not working effectively.

The findings in this report found that Māori business startups and potential tech sector students face significant disadvantages in seeking funding from Māori entities, Iwi and government, despite the need for more New Zealanders to be trained in the tech industry. “In the past decade, New Zealand has brought in 3,500 to 4,500 highly skilled IT professionals from all over the world; yet only a few thousand New Zealanders graduate each year, and only 4% of the technology workforce are Māori (NZTech, June 2022).”

Equitable access to investment and funding opportunities called for greater Māori representation to lead design solutions that reflected their culture, history, language and needs of their community.

Systemic racism and bias also created significant and unfair disadvantages, a stronger focus on training, development and organisations becoming Te Tiriti dynamic were suggestions that came forward.

Whānau, hapū communities and Iwi have largely not had equitable access to the Internet, being overrepresented as statistics of the New Zealand digital divide¹³. Again, this is due to access¹⁴, affordability and cultural reasons that have been largely overlooked by the Government of the day and by researchers.

Māori interviewed in this work consider traditional te ao Māori views and tikanga when considering and working with technologies, a key finding that should guide the redevelopment of tech sector courses that not only meet the requirements of the industry but also whānau, hapū and Iwi needs.

Overall, we can see tides are turning, more rangatahi Māori are turning to technology as a career option, but more support is needed. Having support networks such as Te Matarau means that practitioners can come together to be themselves as Māori and the growth of tikanga-centered Māori-led companies where impact, the well-being of people and planet alongside or instead of profit is the new normal.

There is still more mahi to do and the need for targeted investment led by Māori, enabled by Government approaches to development is critical to ensure we are part of the change ahead.



13 The digital divide and Māori : report for Te Puni Kōkiri / prepared by Infometrics Ltd., 24 July 2001

14 www.devacademy.co.nz



Appendix A: Methodology

Haere whakamua – hoki whakamuri

To go forward - we return to our past

Having a clear process in place to support and guide our work as well as keeping our kairangahau (researchers) and whānau interviewers safe is paramount. Utilising mātauranga Māori to help steer our engagement. It has been important to ensure that we can use our learnings of the past to shape our approach to this body of work.

The research framework used for this project builds upon a set of values, grounded within our culture and identified by Smith and Cram to provide guidance on research and evaluation in a kaupapa Māori context.

This framework includes the following eight principles¹⁵:

Whānaungatanga

A Taumata Rangahau (advisory rōpū of Māori Tech practitioners helped to steer the direction of our research and ensure the work was grounded with grassroots experience from across the Māori Tech Sector. The Taumata helped to foster cultural respect, connectedness, and ideas on how best to engage with whānau, hapū, iwi and community. We acknowledge their significant contribution to this work.

Titiro, whakarongo, kōrero

The Taumata Rangahau helped to develop an understanding of the current environment and established a relevant platform building upon and learn from using their lived experience on what they see, hear and discuss in their respective rohe.

Manaakitanga

Regular communication between the Project leader, Te Whare Wānanga o Awanuiārangi; our Project Sponsor, the Ministry of Business, Innovation and Employment and the Taumata Rangahau built a supportive collaborative research environment that ensured knowledge flows both ways between researchers and all participants.

Aroha

All participants were treated with respect. This meant they were in control of where the engagement would occur, when the engagement would happen, how that engagement would be moderated and what information could become publicly available.

Mahaki

Research questionnaires and interview prompts were co-constructed with the Taumata Rangahau ensuring all voices would be heard and to build trust in the research undertaken and the relationships being formed.

Mana

It was important for our team to remember – Kava e takahia te mana o te tangata “Do not trample on the mana or dignity of a person”. The research interviews were structured on a “whānau” conversational approach where groups of people prompted each other to describe the current Māori and general NZ Tech Sector ecosystem. Having an indigenous institution such as Te Whare Wānanga o Awanuiārangi also helped to provide comfort to those participating in the research that their kōrero would be treated with the utmost honour and respect.

¹⁵ <https://whatworks.org.nz/kaupapa-maori/>

Kia Tūpato

The team constantly reflected on their practice and actions with themselves and those interviewed ensuring everyone was safe during the research and that they have full access to the information/transcripts captured.

He kanohi kitea

The project leader Kaye-Maree through various forums and presentations, was a familiar face helping build trust and creating interactive communication channels across the Taumata Rangahau and those interviewed.

In order to ensure all stakeholders were aware of the research being undertaken, regular communication and dissemination occurred. This plan included a blend of synchronous face-to-face meetings and the use of asynchronous digital technologies:

The communication and dissemination approach are structured around three phases:

- 1. Establishment.** The initial communication stage with stakeholders focused on the key messages driving the research to be undertaken, the research approach developed and the anticipated outcomes for participants, researchers, and stakeholders.
- 2. Implementation.** During this stage, the communication focused on the details of the information shared and the research to be undertaken. It included the dissemination of findings for review and comment. Communication channels will be organised to seek feedback on findings and preliminary recommendations. From this feedback, recommendations will be formulated for implementation in the future.
- 3. Operationalise.** With the publication of the report advocacy of the recommendations will continue through participants, taumata rangahau, Iwi, local and national bodies, and the government. Throughout this process, stakeholders will become increasingly informed about.

Appendix B: Māori Tech Mapping Responses

Below are summaries of the survey data that was gathered.

Survey 1. Influencers and Educators of the Māori Tech Ecosystem

Question 1. How can education and training programmes in the Tech sector be designed for Māori to be successful?

Integrating technology into educational initiatives for Indigenous communities, particularly Māori, can be approached through a Māori worldview and cultural framework. It is essential to address the specific challenges that impact Māori, fostering an understanding of the benefits of continued learning. This can be achieved by incorporating Māori teachers, utilising kaupapa Māori approaches, and employing mātauranga Māori (Māori knowledge) to highlight the existing critical thinking and skills within communities.

To encourage more Māori participation, ensuring that the training and education provided are relevant and relatable is crucial. This involves co-designing programs with Māori input, incorporating Te ao Māori perspectives, Tikanga (Māori customs), and Te Reo Māori (Māori language). The delivery should cater to preferred learning and engagement styles, creating a safe environment where Māori feel comfortable expressing their authentic selves.

Additionally, the integration of technology education should focus on practical applications and industry involvement rather than solely theoretical aspects. This can be achieved through partnerships with Māori organisations, incorporating work-based learning, and providing mentorship opportunities. By placing Māori at the centre and embracing the principles of whānaungatanga (relationships) and tiaki (care), technology education can empower Māori communities and contribute to a better future for Māori youth.

Question 2. What do you think will make education and training programmes in the Tech sector successful for Māori? What do you think is missing?

- Increase the visibility of Māori in tech and highlight their use of technology to benefit whānau, hapū, and iwi.
- Provide clearer pathways for young people in tech, highlighting incremental steps and immediate opportunities.
- Focus on bridging the gap now, rather than in the future, and emphasise the importance of taking action.
- Incorporate local values and a circular economy focus into high-quality education and training programs.
- Implement story-based, authentic, and project-driven learning to make tech education relevant and engaging.
- Innovate teaching methods to simplify and make tech education more effective, including Māori teaching Māori.
- Ensure sufficient funding for program delivery and effective marketing to increase accessibility.
- Create culturally safe working environments where Māori individuals can be themselves.
- Facilitate connections with role models and tech companies to provide hands-on experience and meaningful opportunities.

- Remove barriers to participation, such as access to resources and support, and prioritise relationship-building.
- Encourage early exposure to tech and blend it with cultural knowledge and practices.
- Foster true partnerships and support from Māori and non-Māori stakeholders in the tech sector.
- Address confidence issues resulting from past trauma and family limitations.
- Promote diversity and inclusivity to counter the perception of tech as a sterile, white environment.
- Provide practical support for transitioning into remote working roles.
- Encourage industry involvement, earn-as-you-learn opportunities, and guidance from education to the workforce.
- Integrate te reo Māori and mātauranga Māori into the tech environment to make it culturally relevant.
- Establish an independent Māori R&D lab and a resourced tuakana network for ongoing support.

Question 3. Would having an understanding of what kinds of jobs are available in the tech sector and what skills you could use motivate you to explore tech as a career?

The respondents believe that highlighting education and career pathways in the tech sector would be beneficial. They suggest providing practical and affordable short courses, internships, and work experience to attract people into the sector. It is important to emphasise the development of skills that offer flexibility and the ability to move between different areas. Additionally, they recommend considering personality types, intrinsic motivators, and the safety to dream and be creative.

Exposure to the field and hearing from people with non-linear career paths would be motivating. It is crucial to showcase the impact and outcomes of tech careers and highlight the diversity of roles beyond technical positions. Providing clarity, ease, and progressive steps in career progression is important. Showing the fun, factual, and empowering aspects of tech jobs would also be beneficial.

Understanding transferrable skills and technical skills that can be applied in any job or industry is essential. It is important to have a clear narrative that resonates with individuals who may not have much knowledge about the tech sector. Older generations may need support in transferring their experience, knowledge, and skills into the tech space.

While career pathways are helpful, some respondents believe that getting a foot in the door and experiencing the industry firsthand is crucial. There is a need to focus on emerging industries related to sustainability, renewable energies, and the UN Sustainable Development Goals.

The narrative around tech careers should be made exciting and should reflect Māori language, tone, and sentiment. Matching personal characteristics with different tech roles would help individuals identify suitable career paths. The respondents also emphasise the importance of showcasing Māori mahi internationally to amplify Māori culture and efforts in the tech sector.

Overall, providing clear and relatable information about education, career pathways, transferable skills, and the impact of tech careers would help attract and motivate individuals to pursue opportunities in the tech sector.

Question 4. If you were asked “What is Māori Tech?” how would you describe it?

Māori Tech encompasses a wide range of elements, including technology developed by Māori with a positive Māori outcome in mind, the application of Māori knowledge and values, culturally targeted tech, and tech designed, owned, and controlled by Māori. It involves innovation, cultural expression, and a focus on long-term sustainability. Māori Tech aims to uplift Māori culture, benefit Māori people, and contribute to the prosperity of generations to come. It includes Māori-led initiatives, the integration of Māori values, and the use of tech to support Māori aspirations. Māori Tech is a space for Māori individuals to excel and make a difference.

Question 5. What will active engagement in the “Māori Tech-Industry” mean for Māori?

Active engagement of Māori in the tech industry can lead to a range of positive outcomes, including cultural acknowledgement and the application of Māori values, decision-making inclusion, representation, freedom and autonomy, addressing inequality, economic prosperity, self-determination, improved career pathways, increased income, Māori data sovereignty, community building, and positive impact on whānau, hapū, and iwi. It can empower individuals and communities, provide better access to resources and information, create role models, support self-determination, and contribute to the overall prosperity of Aotearoa.

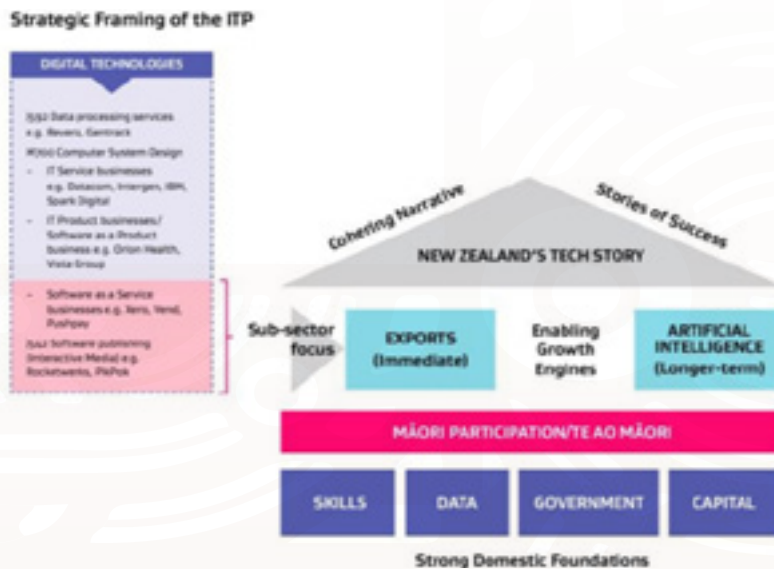
Question 6. If you are based in a rural/isolated region, what support do you require to help the regional tech industry grow?

- **Internet connectivity:** Access to stable and high-speed internet is crucial for participation in the digital world and remote working.
- **Infrastructure and resources:** Investment in workspaces, hardware, equipment, and facilities that promote collaboration and flexible working can facilitate innovation and productivity.
- **Skills development and education:** Access to teachers, mentors, talent, and training programs helps develop the necessary digital skills and knowledge.
- **Community support:** Peer support, networking opportunities, and community tech hubs create a supportive environment and encourage collaboration.
- **Funding and incentives:** Providing financial support, grants, and incentives for Māori tech leaders to return to their communities and establish tech initiatives can drive economic growth and development.
- **Tailored services:** Support services and programs that consider the specific needs of rural and remote areas, including hardware support, mentorship, and training, can bridge the digital divide.
- **Infrastructure investment:** Improve infrastructure, such as fibre connections and reliable electricity, to ensure equal access to technology across different regions.
- **Inclusion and diversity:** Encourage outreach and engagement from local tech industries, creating opportunities for Māori to get involved in IT and digital tech products. Promote inclusivity and diversity within the industry to foster a supportive and welcoming environment.
- **Government support:** Advocacy and policies that promote digital inclusion, address infrastructure gaps, and provide funding for community initiatives can facilitate Māori participation in the tech industry.

Question 7. Do you agree with the diagram and the three priorities, which are: accelerated growth; strong foundations; and Māori participation? Why/Why not?

Some agree with the diagram and the three priorities of accelerated growth, strong foundations, and Māori participation, while others have reservations or suggest alternative perspectives. Here are some key points highlighted in the responses:

- Accelerated growth: Some individuals express concerns that growth alone does not guarantee success and that a focus on positive social and environmental effects, as well as social equity, is important. They emphasise the need to consider the impact of technology on people and the planet, rather than solely focusing on growth.
- Māori participation: Many respondents agree that Māori participation should be a priority and highlight the importance of Māori leadership, ownership, and control in the tech industry. They call for meaningful involvement of Māori in decision-making roles and the ability to shape the direction of tech development.



- Strong foundations: Some individuals suggest that strong foundations should be prioritised, including locally owned critical cloud infrastructure and Māori data sovereignty. They emphasise the need for control and ownership to ensure that Māori interests are protected.
- Te Ao Māori principles and values: Several respondents call for the adoption of Te Ao Māori principles and values throughout the process, including the design of the diagram and the development of the tech industry. They stress the importance of cultural authenticity, inclusion, and a holistic approach.
- Inclusivity and diversity: Some individuals highlight the need to celebrate and recognize the contributions of the broader industry, including creative tech sectors like gaming and storytelling. They also mention the importance of addressing issues of racism and ensuring equity within the tech industry, particularly in the area of artificial intelligence.
- Rural communities: Some respondents point out the need to address the specific challenges faced by rural communities, including their limited participation, engagement, and access to technology. They suggest focusing on bridging the gap between rural and urban communities before prioritising the three pillars.
- Narrative and dialogue: Individuals express a desire for more narrative, dialogue, and reflection of Māori culture and perspectives within the diagram and the wider discussion. They emphasise the importance of creating a space that authentically represents and engages Māori.

Question 8. What other work streams can include the Industry Transformation Plan to work for Whānau Māori?

- Ensuring accessibility and equity for Māori participation in tech.
- Promoting inclusion and active engagement of Māori in decision-making processes.
- Recognizing the importance of multiple settings and perspectives for meaningful engagement.
- Consideration of the environment and mana-enhancing kōrero in discussions.
- Uncertainty or lack of understanding of the question.
- Exploring tech-related roles beyond the traditional tech sector.
- Connection and collective engagement.
- Relevance and practicality in relation to whānau well-being.
- Reclamation and revitalization of language and cultural practices through tech.
- The role of education in tech advancement and inclusion.
- Ensuring access to technology in regional and rural communities.
- Considering economic benefits and quality of service for Māori.
- Private sector investment and growth.
- Addressing systemic racism and promoting equity.
- Incorporating IT in education and community learning.
- Focus on mental health and well-being in the tech industry.
- Collaborative decision-making and involvement of Māori in all sectors.
- Integration of tech in Māori health providers and cultural knowledge.
- Considering the underemployed and diverse age groups.
- Independent, grassroots-focused Māori IT plans for whānau purposes.

Question 9. What other workstreams do you think should be included in the Industry Transformation Plan to encourage Māori engagement?

The survey responses emphasise the need for representation and inclusion of Māori in the technology sector. This includes ensuring Māori participation in decision-making processes, representing diverse age groups, and promoting Māori data sovereignty. Suggestions also involve engaging with Māori schools and communities, providing support for Māori organisations, and broadening the scope of the tech industry to include cultural and environmental aspects. Additionally, there is a call for financial education, entrepreneurial literacy, and cultural training within the tech sector. The overall aim is to create a more inclusive and diverse tech industry that values Māori perspectives and promotes equitable opportunities for all.

Question 10. The Industry Transformation Plan report showed that a high percentage of Māori had found it difficult to find internships or employment after graduating. What do you think the reason for this is?

The reasons for the difficulty Māori individuals face in finding internships or employment after graduating include institutional racism, unconscious bias, lack of visibility and effective marketing, poor industry relationships, lack of opportunities, unwillingness to adapt, financial constraints, racism in hiring practices, the need to move away from home, cultural mismatches between companies and Māori values, impact of COVID-19 on job availability, perceptions of skill gaps, poor industry connections, lack of access and networks, assumptions and biases in job design and recruitment processes, lack of representation, inadequate support from organisations, limited role models, inadequate communication about opportunities, undervaluing Māori contributions, lack of commitment and investment from the industry, lack of internships, focus on experienced overseas talent, lack of strong role models, difficulty in navigating the system, underskilled graduates, racism in interview processes, limited programs and support, differences in approach, lack of experience, biased CV evaluation, limited marketing and branding for Māori engagement, prejudice and cultural fit expectations, broad skill requirements, lack of investment in supporting internships, and discriminatory hiring practices favouring Pākehā or overseas workers.

Question 11. The report also noted that larger companies in the sector, keen to support a pipeline of Māori and Pacific Peoples talent in the sector, face challenges connecting and guiding cohorts of students or young Māori into their businesses. Do you agree? Why do you think this is?

Based on the responses provided, it is clear that there are multiple factors contributing to the difficulty Māori individuals face in finding internships or employment after graduating. Here are some of the key reasons identified:

- **Institutional racism:** Several responses highlight racism as a significant barrier. Racism generated from colonisation, hiring biases, lack of cultural fit, and unconscious biases in recruitment and hiring processes can all contribute to the challenges faced by Māori individuals.
- **Lack of visibility and connection:** Many respondents mention a lack of visibility of opportunities, ineffective marketing, and poor industry relationships as obstacles. There is a need for better connections between organisations and programs that support Māori interns and graduates.
- **Skills and experience recognition:** The importance of cultural skills and experiences, such as te reo fluency, kaupapa Māori experiences, and leadership, is mentioned. It is suggested that employers may not consider these factors when evaluating candidates, focusing more on technical skills and qualifications.
- **Limited resources and opportunities:** Lack of internships, unwillingness to adapt, lack of financial ability, and limited resources from organisations to provide internships are highlighted as barriers. Additionally, the impact of the COVID-19 pandemic on the availability of junior roles and internships is mentioned.
- **Lack of support and mentorship:** The absence of dedicated programs, poor career development, and a lack of strong role models and mentors for Māori individuals are identified as contributing factors.
- **Cultural mismatch and workplace environment:** The workplace environment is considered a significant factor, with respondents mentioning that it may not be culturally conducive or designed to support the needs of Māori and Pacific Peoples. The lack of Māori representation in leadership positions is also highlighted as a barrier.

- Networking and relationships: Building relationships and networks is seen as crucial for bridging the gap between Māori talent and employment opportunities. Companies are urged to invest in relationship-building and better partnerships with Māori communities and organisations.

Question 12. Companies are keen to support a pipeline of Māori and Pacific Peoples talent in the sector, however, they face challenges connecting and guiding cohorts of students or young Māori into their businesses”? Do you agree? If you agree, why? If you do not agree, why not?

The responses are diverse, with some individuals agreeing and others disagreeing with the statement. Here are some key points reflecting both perspectives:

Agree:

- Cultural safety and connection: Many agree that companies struggle to connect with Māori and Pacific Peoples because they do not create culturally safe environments or make meaningful efforts to engage with communities.
- Lack of relationships and partnerships: Companies are perceived as lacking strong relationships with educational institutions, iwi (tribes), and communities. Building these partnerships is seen as essential for guiding cohorts of Māori and Pacific students into businesses.
- Need for proactive initiatives: It is suggested that companies should take a proactive approach, going directly to the people and communities they want to engage with, rather than expecting them to come to them.
- Lack of representation and cultural alignment: Some respondents mention the importance of Māori representation in the workforce and the need for companies to align their values with those of Māori and Pacific Peoples.

Disagree:

- Lack of genuine commitment: Some respondents express scepticism about companies' intentions, suggesting that they may not be genuinely interested in supporting a pipeline of Māori and Pacific Peoples' talent and are simply following a trend or meeting diversity quotas.
- Need for meaningful changes: It is argued that if companies were truly keen on supporting Māori and Pacific Peoples, they would be willing to make meaningful changes and invest in initiatives that address the barriers faced by these communities.
- Starting at intergenerational change: Instead of focusing solely on finding staff at the entry-level, it is suggested that companies should support initiatives that encourage Māori interest in technology from a young age and involve whānau (family) in the process.
- Overall, it is clear that there are differing perspectives on companies' efforts to connect and guide Māori and Pacific Peoples into the tech sector. The opinions range from acknowledging the challenges and suggesting improvements to expressing scepticism about the commitment and effectiveness of current initiatives.

Question 13. How do you think corporations and government agencies can retain Māori talent in their organisations?

- Cultural responsiveness: Create a workplace that is culturally responsive and comfortable for Māori employees to thrive in. This includes adopting Māori thinking and values within the organisation.
- Representation and leadership: Increase the representation of Māori in leadership positions within the organisation.
- Relationship-building and trust: Build trust and meaningful relationships with Māori employees by actively listening to their needs and acting upon their feedback.
- Support and development: Provide support systems, professional development opportunities, and pathways for growth to Māori employees.
- Inclusivity and diversity: Foster an inclusive and diverse workplace by implementing policies and procedures that ensure equal opportunities and respect Te Tiriti o Waitangi principles.
- Recognition and reward: Recognize and reward the knowledge, experience, and contributions of Māori employees.
- Genuine engagement: Engage with Māori organisations and communities to provide training, and learning opportunities, and promote Māori initiatives.
- Long-term vision: Move away from a transactional focus and prioritise long-term outcomes and the well-being of Māori employees.
- Autonomy and trust: Give Māori employees the freedom and autonomy to lead in their areas of expertise, without micromanaging or overburdening them with cultural questions.
- Career pathways: Provide clear career pathways and opportunities for advancement within the organisation.

Question 14. Why does the Māori Technology Ecosystem rely on increasingly stretched individuals, with limited resources, to do the connecting, the inspiring, and advising?

- Lack of visibility and representation: There is a need for greater visibility and representation of Māori individuals within the tech industry. Māori talent may be underrepresented, making it challenging to build a robust ecosystem.
- Educational challenges: There is a need to address educational challenges and consult with Māori individuals to ensure their aspirations and needs are at the centre of initiatives. Collaborating with Māori as advisors can help drive change in the sector.
- Fear of getting it wrong: Some non-Māori individuals may have a fear of making mistakes or being criticised on social media for their efforts to support Māori talent. Lack of training and support for allies can also hinder progress.
- Limited resources and funding: The Māori Tech Ecosystem may face a lack of resources, funding, and investment. This can limit the capacity to grow and develop the ecosystem.
- Overreliance on a few individuals: There may be a tendency to rely on a small number of Māori leaders or superstars to drive the initiatives within the ecosystem. This can lead to an excessive burden on these individuals.

- Lack of understanding and value: Some non-Māori individuals may not fully understand or appreciate the strengths that Māori perspectives bring to the tech industry. It is essential to recognize the importance of Māori contributions beyond diversity and inclusion.
- Trust issues and systemic suppression: Māori innovation may face challenges due to systemic issues and historical suppression. There may be concerns about outsiders benefiting from government contracts without delivering meaningful outcomes for Māori.
- Limited capacity and competing priorities: Māori individuals working in the tech industry may face competing priorities, such as family responsibilities, that limit their availability and opportunities.

Question 15. What suggestions would you make to change this reliance on increasingly stretched individuals?

- Collaboration and mentorship: Establish working groups, mentorship programs, or networks that connect leaders, experts, and mentors in the Māori tech space. These initiatives can provide support, guidance, and financial assistance for their work and help build connections within the ecosystem.
- Targeted support and professional development: Provide targeted support and professional development opportunities for Māori individuals in the tech industry. This can include introducing less-experienced individuals and fostering a tuakana/teina framework for knowledge sharing and skill development.
- Engaging non-Māori advocates: Encourage non-Māori advocates to play a role in supporting the Māori Tech Ecosystem. This can involve raising awareness, fostering understanding, and collaborating with Māori individuals and organisations.
- Resource allocation and financial support: Allocate appropriate resources and funds to support the Māori tech community. This includes providing financial support for initiatives, recognizing the value of Māori talent, and compensating individuals for their time and expertise.
- Trust-building and collaboration: Foster trust and collaboration between Māori and non-Māori individuals, organisations, and government agencies. This can be achieved through open dialogue, shared decision-making, and creating opportunities for meaningful partnerships.
- Growing the talent pipeline: Focus on improving the pipeline of Māori individuals into the tech industry. This can involve investing in education, training programs, and mentorship opportunities that specifically benefit Māori students.
- Advocacy and policy changes: Advocate for policy changes that prioritise cultural connection, centralise Te Tiriti principles, and acknowledge the importance of Māori perspectives in the tech sector. This includes holding companies and organisations accountable for their actions and promoting partnerships.
- Cultural connection and understanding: Invest in roles and initiatives that facilitate cultural connection and understanding between different cultures within the tech industry. This

can include funding positions that specifically focus on fostering cultural exchange and collaboration.

- **Collective action and collaboration:** Encourage collective action and collaboration within the Māori Tech Ecosystem. This involves building networks, sharing knowledge and resources, and supporting each other's initiatives.
- **Mindset shift and learning:** Emphasise the need for a mindset shift, both within the Māori community and among allies. This includes challenging self-reliance, deficit thinking, and outdated habits, and embracing a culture of learning, collaboration, and support.

Question 16. What do you think are the barriers to empowering Māori to participate in the Tech sector?

- **Historical and systemic factors:** Disadvantages resulting from the effects of colonisation, including social and economic disparities, contribute to the underrepresentation of Māori in the tech sector. These factors can create barriers to accessing education, financial resources, and opportunities.
- **Education system and pathways:** Issues within the education system, such as the cost of education, limited accessibility to tech courses, and the emphasis on specific qualifications and certifications, can hinder Māori individuals from pursuing tech careers. The lack of exposure to tech opportunities and limited awareness of potential pathways also play a role.
- **Cultural barriers and biases:** Unconscious bias, cultural skills and experiences not being valued, lack of culturally responsive and inclusive environments, and racism within organisations can create challenges for Māori individuals in the tech sector. The dominance of Pākehā (non-Māori) leadership and governance further perpetuates the imbalance.
- **Lack of role models and representation:** Limited visibility of Māori individuals in tech roles and a lack of relatable role models can deter Māori youth from considering tech careers. Creating more diverse and inclusive environments with strong Māori representation can help address this issue.
- **Economic factors and support:** Financial barriers, the need to support whānau (family) obligations, and limited access to opportunities and funding for Māori-led tech businesses can hinder progress in the sector. Addressing these economic factors and providing adequate support can help foster Māori participation and entrepreneurship.
- **Cultural awareness and responsiveness:** Organisations need to cultivate culturally aware and responsive environments that embrace Māori ways of being and incorporate mātauranga Māori (Māori knowledge) into tech practices. Recognition of systemic issues and a commitment to equity and inclusion are essential.
- **Mentorship and support:** Providing mentorship programs, internships, and buddy systems can offer guidance and support to Māori individuals pursuing tech careers. These initiatives can help build confidence, provide networking opportunities, and bridge the gap between education and employment.
- **Marketing and awareness:** Enhancing awareness of the tech sector's opportunities, showcasing diverse roles beyond programming, and actively marketing these opportunities to Māori communities, schools, and whānau can inspire interest and engagement.
- **Collaboration and self-determination:** Collaborating with Māori leaders, and iwi (tribal) chairs, and involving Māori across all levels of decision-making can foster self-determination

and empower Māori in shaping their own tech future. Building a sense of independence and self-determination through tech authorities can also contribute to Māori participation.

Question 17. What support do you think is required to provide the skills to enable pathways to full-time employment for Māori?

- **Culturally responsive education:** Developing accessible courses that reflect Māori culture, values, and aspirations, with Māori teachers and mentors, can create an inclusive learning environment. Incorporating pastoral care, learner support, and whānau inclusion is crucial for success.
- **Industry partnerships and support:** Collaborating with industry partners to co-develop curriculum and learning materials ensures industry relevance. Providing financial support, mentorship programs, internships, and employment opportunities can help Māori individuals gain practical skills and experience.
- **Soft skills and preparation:** Recognizing the importance of soft skills and preparing Māori individuals for the workforce can enhance their employability. Micro-credentials, in-house training, and on-the-job technical training can help bridge the skills gap.
- **Empowering Māori leaders:** Supporting Māori leaders and professionals already working in the tech sector to dedicate part of their time to teaching, mentoring, and growing the capacity and capability of Māori individuals can create a self-sustaining ecosystem.
- **Clear pathways and support structures:** Providing clear pathways from education to employment, with ongoing support structures, ensures a smooth transition. Wrap-around support, networking opportunities, buddy systems, and mentorship programs can help Māori individuals navigate the tech industry successfully.
- **Indigenous tech initiatives:** Encouraging the development of Māori-led tech initiatives, think tanks, and digital platforms that align with Māori aspirations can empower self-determination and shape the future of Māori participation in the tech sector.
- **Funding and partnership support:** Securing funding from government, industry, and Māori sources to support Māori-led initiatives, training programs, and educational opportunities is crucial. Building robust partnerships between industry and Māori can facilitate the growth and development of Māori representation in the tech sector.
- **Cultural understanding and empathy:** Promoting cultural understanding and empathy among gatekeepers and industry leaders can create inclusive environments that value Māori ways of being and enhance the recruitment and retention of Māori talent.
- **Early engagement and relationship building:** Starting tech training at a young age, such as in primary schools, and fostering strong relationships with whānau can cultivate interest and skills in technology among rangatahi (youth).
- **Networking and community engagement:** Encouraging Māori individuals to actively participate in industry activities, networking events, and community engagements can create opportunities for skill development, visibility, and career advancement.

Question 18. Why do you think there is a low percentage of Wāhine Māori in the industry?

- **Lack of representation and visibility:** The tech industry is often perceived as male-dominated and lacking diversity. Limited visibility of successful Wāhine Māori role models in tech can discourage younger generations from considering it as a viable career option.
- **Sexism and racism:** Bias, sexism, and racism exist within the tech industry, creating barriers for Wāhine Māori. Discrimination and harassment can contribute to a hostile work environment, making it difficult for Wāhine Māori to thrive.
- **Family responsibilities and cultural obligations:** Wāhine Māori often carry significant responsibilities within their families and communities. Balancing these obligations with a demanding tech career can pose challenges and may deter some from pursuing opportunities in the industry.
- **Lack of early exposure and opportunities:** Limited early exposure to tech and STEM fields, as well as a lack of supportive pathways and opportunities, can prevent Wāhine Māori from considering tech as a viable career option. Providing early exposure and educational support can help spark interest and open doors for Wāhine Māori in the industry.
- **Intersectionality of gender and ethnicity:** The experiences of Wāhine Māori are shaped by both gender bias and racism. Addressing the unique challenges faced by Wāhine Māori requires an understanding of the intersections of these forms of discrimination and creating inclusive environments that support their advancement.
- **Whānau-centred priorities:** Prioritising whānau (family) and community is an integral part of Wāhine Māori identity. Creating work environments that accommodate and support whānau responsibilities can enable Wāhine Māori to pursue careers in tech without compromising their cultural values and commitments.
- **Lack of targeted marketing and outreach:** Tailoring marketing and outreach efforts to specifically target Wāhine Māori can help raise awareness and interest in tech careers. Highlighting the relevance of tech in creating side hustles and entrepreneurial opportunities can broaden the appeal beyond traditional 9-to-5 jobs.
- **Supportive sector and organisations:** Building a supportive sector that values diversity, offers mentorship and development opportunities, and addresses issues of bias and discrimination can encourage more Wāhine Māori to enter and excel in the tech industry.

Question 19. Why do you think many Rangatahi aren't choosing to enter the industry?

- **Lack of support and networks:** Rangatahi may face challenges in accessing support systems and peer networks that can guide and inspire them to pursue tech careers. The absence of family members or mentors who have followed a similar path can make it more difficult for them to navigate the industry.
- **Limited safe and accessible learning opportunities:** Access to education and resources for studying tech may be limited, particularly in communities where technology infrastructure and connectivity are not readily available or affordable. This can hinder their ability to acquire the necessary skills and knowledge.

- Pressure to secure immediate employment: Economic pressures and the need to contribute to their whānau's financial well-being may lead Māori rangatahi to prioritise finding a job early on, rather than pursuing further education or exploring tech opportunities.
- Perceived difficulty and lack of attainability: Some Māori rangatahi may feel intimidated by advanced tech skills, perceiving them as challenging or unattainable. Limited examples of success stories and effective communication of opportunities within the industry may contribute to this perception.
- Lack of early exposure and awareness: Insufficient exposure to tech-related fields, particularly during the early years of education, can result in a lack of awareness and understanding of the potential and possibilities within the tech industry. Early exposure and education tailored to their interests can help spark their interest and confidence in pursuing tech careers.
- Education system and bias: The education system may not effectively cater to the needs and aspirations of Māori rangatahi. Bias within the system and a lack of representation of Māori perspectives and culture in STEM fields can create barriers to engagement and success.
- A mismatch between industry offerings and aspirations: It is important to assess whether the opportunities and offerings within the tech industry align with the aspirations and interests of Māori rangatahi. Creating an inclusive and culturally responsive environment that values Māori worldviews can help foster a sense of belonging and attract more participation.
- Negative perceptions and stereotypes: Negative perceptions, such as associating tech with being nerdy or limited to certain types of individuals, can deter Māori rangatahi from considering tech careers. Challenging these stereotypes and showcasing the creative and problem-solving aspects of tech can help generate interest.

Question 20. How can the education/training pipeline be changed to increase Māori participation (especially Rangatahi/Taitamariki/Wāhine) in the Tech sector?

- Early intervention and education: Introducing tech education at an early stage, such as in primary and intermediate schools, can spark interest and familiarity with the industry. Providing digital technology subjects and opportunities for all senior students and incorporating culturally relevant content can make tech more engaging.
- Collaboration and partnerships: Collaborating with Māori/Iwi tech companies and communities can help design and deliver programs that align with Māori values and aspirations. Partnering with industry professionals and organisations to provide mentorship, internships, and real-world experiences can bridge the gap between education and the workforce.
- Culturally responsive teaching: Supporting kaiako (teachers) to develop skills, confidence, and interest in tech education is essential. Encouraging the use of te reo Māori and integrating Māori worldviews within STEM education can foster a sense of belonging and relevance for Māori rangatahi.
- Awareness and promotion: Increasing awareness of the tech industry and the opportunities it offers is crucial. Showcasing the achievements and contributions of Māori in tech can provide

role models for aspiring rangatahi. Celebrating success stories and promoting the sector in communities can generate interest and engagement.

- **Flexible learning options:** Creating flexible learning pathways that accommodate the diverse needs of Māori rangatahi, including “earn as you learn” opportunities and support for those with dependents, can help overcome barriers to participation in tertiary education.
- **Industry involvement:** The tech industry should actively engage with Māori rangatahi, meet them where they are, and listen to their needs and aspirations. Building networks, providing mentorship, and offering internships or work placements can help Māori rangatahi gain exposure and practical experience in the industry.
- **Inclusive and accessible opportunities:** Making tech education and resources accessible to all regions and communities, including remote areas, is important. Providing scholarships and financial support can remove barriers to entry for those who may not have the means to pursue tertiary education.
- **Rethinking perspectives and narratives:** Challenging negative perceptions and stereotypes about the tech industry and reframing the narrative to emphasise the broad range of skills and opportunities available can help attract Māori rangatahi. Recognizing Māori as key stakeholders and leaders in the industry is essential for creating a more inclusive and equitable tech sector.

Question 21. Can you identify any other issues that need to be explored in the Māori Tech space?

It is evident that investment by iwi into the tech industry, dismantling existing structures, building connections with global networks, and focusing on community-centric approaches are important considerations. Data sovereignty, workplace culture, and increasing representation in various tech sectors are also crucial aspects to address. Furthermore, supporting Māori-owned platforms, collaboration, empowerment, and recognizing the value Māori bring even before acquiring technical skills are vital. Paying Māori for their contributions, government procurement expectations for Māori organisations, and ensuring the education system empowers Māori youth are important factors to consider as well. Ultimately, it is about reclaiming Māori independence, nurturing the potential of Māori youth, and fostering a future of freedom and success for the Māori people.

Survey 2. Māori Interest in the Tech Sector: Environment Scan

Question 1. What do you think will make education and training programmes in the Tech sector successful for Māori? What do you think is missing?

- Lowering barriers to entry: Target Māori through established networks and advertising, and provide funding support for living expenses during education and training.
- Vocational pathways: Create direct pathways from educational programs to job opportunities, particularly for wahine Māori. Increase representation of Māori in tech companies and support apprenticeship programs.
- Cultural relevance and acceptance: Articulate the cultural value of tech careers in a way that aligns with a Māori worldview. Celebrate success stories of Māori innovators and provide outlined pathways for others to follow.
- Education and training: Improve educational programs by providing personalised journeys, establishing strong connections between teachers and learners, and integrating te reo and Māori scenarios. Ensure access to technology and passionate teachers, especially in low socio-economic communities and low decile schools.
- Support and mentorship: Offer on-the-job training, internships, and paid learning opportunities. Encourage Māori leaders to support and mentor aspiring tech professionals.
- Community engagement: Involve parents and communities in understanding the value and career opportunities in the tech sector. Highlight role models and success stories that young people can relate to.
- Resources and access: Increase resources and training opportunities in regional areas. Support existing Māori-led tech businesses and provide scholarships for Māori working in IT without formal qualifications.
- Cultural awareness and understanding: Provide education and training on mātauranga Māori and its importance in the tech sector. Foster an understanding of Māori aspirations and motivations.
- Early engagement: Start introducing tech education at a younger age and ensure all children have access to necessary devices and resources.
- Cultural connection and engagement: Deliver training programs in a Māori Tikanga way, emphasising introductions and whānaungatanga. Empower Māori communities to lead and engage with their own people.
- Youth-focused approaches: Appeal to Māori youth through their interests, hobbies, and preferred communication tools. Provide relatable mentors, address mental health challenges, and incorporate counselling, mentoring, and coaching.
- Collaborative approach: Increase Māori representation in tech education processes and encourage Māori tech companies to participate in training programs. Emphasise team achievements rather than individual outcomes.

Question 2. Would having an understanding of what kinds of jobs are available in the tech sector and what skills you could use motivate you to explore tech as a career?

It seems that having an understanding of the various jobs available in the tech sector and the skills required for those roles would indeed motivate exploring tech as a career. Additionally, there is a desire for more awareness and education around the different career pathways in tech, as well as the outcomes and impact of those jobs.

Some mentioned the importance of role models and personal connections, particularly within Māori and Pasifika communities, to showcase the possibilities and benefits of working in the tech sector. Soft skills, such as teamwork, communication, and agile thinking, were also highlighted as important for success in tech careers.

Overall, it is clear that providing information about the diverse range of tech jobs and the skills needed, along with real-life examples and stories, can inspire and motivate individuals to consider tech as a viable career option.

Question 3. If you were asked “What is Māori Tech?” how would you describe it?

- Technology developed and created by Māori, using Māori knowledge, language (reo Māori), and cultural principles (Tikanga).
- Māori-led initiatives and businesses in the tech space, working towards Māori aspirations and enhancing Māori outcomes.
- Technology that incorporates Māori whakapapa (genealogy), relationships, and culture to enhance or differentiate products and services.
- Tech solutions targeting Māori needs, such as language apps, marae maps, and data sovereignty tools.
- A collection of businesses in the tech industry that authentically share Māori information, language, products, and services.
- Māori-centric technology that integrates Māori values, principles, and knowledge systems throughout the design, development, and consulting process.
- Tools, devices, and apps created using Māori knowledge and guided by Māori Tikanga.
- Technology that is developed and adopted with a focus on improving outcomes for Māori.
- Māori-led innovation and storytelling through the use of technology.
- A Māori knowledge system managed, controlled, and facilitated by Māori within the digital space.
- Technology that empowers and gives agency to Māori communities, with a focus on meaningful, empathetic, and holistic solutions.

Question 4. What will active engagement in the “Māori Tech-Industry” mean for Māori?

- Increased participation in global markets through tech products and services, leading to economic opportunities and growth.
- Involvement in design, marketing, and rollout processes, allowing Māori to have a say in shaping technology and its applications.
- Empowerment of Māori individuals and communities, supporting their whānau, enhancing their mana (both nationally and internationally), and enabling influential decision-making in the industry.
- Preservation and expression of Māori identity in a new realm, leveraging technology to promote Māori culture, language, and knowledge (mātauranga).
- Creation of sustainable industries that Māori can control and evolve, leading to job creation, local innovation, and the development of businesses owned by whānau and iwi.
- Strengthening connections, cultural heritage, and mātauranga through technology that keeps Māori connected, protects their place and space in Aotearoa New Zealand, and supports the promises of Te Tiriti o Waitangi.
- Increased wealth generation and economic opportunities for Māori individuals and communities.
- Showcase of Māori culture, language, and innovation globally, leading to international recognition and representation.
- Role modelling for future generations, inspiring and providing pathways for Māori youth to pursue careers in the tech industry.
- Contribution to self-determination and sovereignty for Māori, with the ability to control narratives, IP, and decision-making in the tech space.
- Access to opportunities and resources that bridge the digital divide, allowing Māori to participate fully in the digital age.
- Skill development and career growth beyond traditional job roles, creating opportunities for Māori to flourish, be inventive, and build whānau wealth.
- Increased representation and Māori leadership in the wider tech industry, ensuring Māori perspectives are valued and integrated.
- Integration of Māori values, Tikanga, and mātauranga into technology, addressing issues of data privacy, treating things as sacred or tapu, and reclaiming ownership of Māori data.
- Improved outcomes for Māori and technology, with reciprocal enrichment and positive impacts on both.
- Building, creating, and imagining spaces for future generations, actively engaging in shaping the future of technology.
- Potential for a future away from low-paid wage jobs and unemployment, providing opportunities for Māori to decolonize work and find meaningful careers.

- Advancement of Māori self-determination, rangatiratanga, and sovereignty through active engagement and ownership in the tech sector.
- Removal of barriers to participation, leading to improved opportunities, representation, and outcomes for Māori.
- Growth and development for whānau, hapū, iwi, and the Māori economy as a whole.
- Integration of Māori culture, Tikanga, and data sovereignty into the tech industry, aligning technology with Māori beliefs and values.
- Enhanced education and training opportunities through funding and programs focused on Māori in tech.
- Increased visibility and recognition of Māori in the tech sector, inspiring rangatahi and creating a sense of belonging and possibility.
- Regular programs, training, workshops, and information sharing can help support and nurture Māori engagement in the tech space.

Question 5. If you are based in a rural/isolated region, what support do you require to help the regional tech industry grow?

- Exposure to successful Māori operating in the tech industry, providing role models and inspiration.
- Access to fast and reliable broadband connections, ensuring connectivity and access to online resources.
- Support from kaiako (teachers) and mentors who can guide and assist Māori individuals in navigating the tech industry.
- Recognition of regional areas and the need to provide opportunities beyond the main cities of Auckland, Christchurch, and Wellington.
- Promotion of remote work as a viable option, allowing Māori in regional areas to participate in the tech industry without the need to relocate.
- Active funding and encouragement of regional start-ups, ensuring that tech innovation and entrepreneurship are not limited to major urban centres.
- Availability of good internet infrastructure and tools to facilitate remote work and learning.
- Integration of Māori values, integrity, and mana into tech spaces to ensure cultural alignment.
- Access to Māori-owned and managed 5G networks, leveraging fibre and broadband infrastructure to enable private 5G networks across rural regions.
- Provision of devices, internet access, and digital skills training to Māori individuals and communities in isolated areas.
- Creation of tech hubs and free training programs in rural and regional areas, providing resources and support for tech development.
- Funding and mentorship from business leaders who support Māori engagement in the tech sector.
- Customised training and education programs that address the specific needs and responsibilities of Māori learners and their communities.

- Reliable and secure internet connectivity, addressing issues of stability and accessibility.
- Linking tech-related training with traditional industries and jobs in rural and regional areas to foster tech integration and innovation.
- Resources, opportunities, and exposure to the tech industry to enable indigenous communities to engage and participate.
- Support for the development of technology hubs with proper infrastructure and equipment, including recording studios and tech coordinators.
- Access to quality internet infrastructure and devices, allowing Māori in remote areas to connect and participate fully in the digital world.
- Government responsibility for upgrading and maintaining infrastructure, including internet, electricity, and technology resources.
- Supportive environments that cultivate desired learning habits, provide online courses and facilitate small-scale tech projects for practical application.
- Kanohi ki te kanohi (face-to-face) engagement and support initially, followed by gradual empowerment for independent work in tech.
- Investment in wifi, hardware, good kai (food), remote learning classes, and community environments for sharing and discussing tech learnings.
- Building a connected ecosystem in regional areas to ensure opportunities are not missed or overlooked.

Question 6. What other work streams can include the Industry Transformation Plan to work for you and your whānau?

- Emphasise support, investment, and focus on skills development as a key aspect.
- Preserve and digitise Māori historical information to prevent its loss and enable future access.
- Remove barriers to digital access, such as improving internet provision and device availability.
- Explore the creation of Māori-owned tech businesses or working for Māori-owned businesses.
- Support te reo Māori translations and quality assurance/editing of online Māori content.
- Prioritise education and early exposure to tech for students, encouraging them to view it as a viable career option.
- Provide support for youth and career changers in the tech industry.
- Foster cultural change in the adoption and use of technology, focusing on community support.
- Develop literacy, numeracy, and online coaching programs.
- Encourage leadership and governance roles to have cultural diversity policies.
- Promote the decentralisation of IT businesses to regions with higher Māori populations for job creation.
- Address the decolonisation of history and promote leadership and representation in decision-making.

- Offer on-the-job learning opportunities for capable youth who may lack formal training.
- Acknowledge and address the gap in baseline education for technical roles in tech, providing support.
- Introduce an Industry Transformation Plan accessible to everyone.
- Support online businesses and tech hubs in rural communities.
- Provide financial support for Māori startups and increase funding for related initiatives.
- Encourage enthusiasm for tech from an early age and explore opportunities in various fields.
- Focus on niche tech careers and entry-level jobs to broaden opportunities and increase diversity.
- Promote education taught by Māori for Māori, emphasising teamwork, empathy, and leadership.
- Create pathways and opportunities for young Rangatahi (youth) to test and pilot their ideas.

It's important to note that some responses were "Not sure" or "N/A," indicating a lack of information or uncertainty on those particular points.

Survey 3. Māori-Led Tech Companies: Environment Scan

Question 1. How can education and training programmes in the Tech sector be designed for Māori to be successful?

- Address socio-economic disparities by providing long-term support and resources to disadvantaged rangatahi (youth) who show aptitude and drive but lack opportunities.
- Incorporate Māori culture into tech education programs and tailor teaching methods to suit the learning styles of Māori students.
- Encourage the tech industry and larger players to drive positive changes and contribute to education and training initiatives.
- Improve accessibility through online platforms and consider the needs of rural communities.
- Design and deliver tech education programs based on Māori or kaupapa Māori values.
- Understand and consider the social, environmental, and cultural context of each Māori individual, while observing technological trends like the metaverse.
- Focus on problem-solving skills, thinking outside the box, and finding technical solutions to real-world issues.
- Provide user-centred, holistic, empathetic, and remote learning options for Māori students, with support from scholarships and iwi (tribal) resources.
- Increase opportunities and entry points for tech careers, particularly in rural areas.
- Implement modular and competency-based learning approaches with visible markers of progress and achievements.
- Reinforce the inherent potential and abilities of Māori students in acquiring technical skills.
- Start tech education at a younger age and remove age limitations, as Māori children are born into a technology-driven world.
- Relate technology to the Māori worldview and focus on problem-solving that addresses issues affecting Indigenous communities.
- Increase the presence of Māori teachers and role models in tech education.

Question 2. If you are based in a rural/isolated region, what support do you require to help the regional tech industry grow?

- Increase government funding and support for Māori whānau (families).
- Improve access to 5G technology.
- Foster collaboration and support among local tech businesses.
- Conduct economic analysis of regional supply and demand in the tech industry.
- Allocate research funding for tech-related projects.
- Focus on streaming capabilities for tech coders.

- Provide resources and equipment for tech education.
- Encourage the sharing of experiences and knowledge through community engagement.
- Enhance internet options and access to tech events for rural communities.
- Create localised workspaces and job opportunities to reduce the need for Māori to migrate to urban areas for tech roles.
- Improve computer resources and internet coverage in rural communities.
- Establish support programs for rural schools and communities.

Question 3. The recent Industry Transformation Plan report showed that a high percentage of Māori found it difficult to find internships or employment after graduating. What support do you think is required to enable pathways to full-time employment for Māori (especially Rangatahi/Wāhine)?

- Exploring the possibility of a tech arm of TupuToa to support tech education and opportunities for Māori communities.
- Investigating patterns among Māori individuals who face difficulties in tech, such as location, completed qualifications, personality traits, and the level of whānau connectivity.
- Implementing paid internships to support rangatahi (young people) in gaining industry experience.
- Cultivating strong relationships between tech companies and offering internships to a certain number of interns each year.
- Providing more support for smaller tech organisations to offer hands-on experience and mentorship to rangatahi and wāhine (women).
- Strengthening connections with existing tech firms to create more opportunities for Māori individuals.
- Utilising grants, such as the Callaghan Experience Grant, to support Māori individuals in gaining industry experience.
- Fostering self-worth, business skills, negotiation skills, networking abilities, and remote work skills among Māori individuals.
- Developing specific approaches for each tech discipline.
- Establishing Māori business internships or cadetship programs for a minimum duration of 12-24 months.
- Providing resources and funding for organisations like Mana Inc to run tech programs for rangatahi.
- Addressing the financial challenges associated with unpaid internships and the high cost of living.
- Building partner capability with established businesses to adopt inclusion and diversity (I&D) culture.

- Offering subsidies for companies to employ Māori individuals with support, promoting a more diverse and competent tech workforce.
- Providing real-life experiences in different fields to broaden perspectives and develop resilience.
- Encouraging industry employers to create internships and opportunities for rangatahi, with appropriate support and guidance.
- Incorporating entrepreneurship and technology education, leadership development, and investment in their own schools to empower Māori youth.
- Addressing the cost of education, accessibility to pathways, the need to prioritise income generation, and the limited focus on qualifications in the education system.

Question 4. What do you think will make education and training programmes in the Tech sector successful for Māori? What do you think is missing?

- Increased representation and involvement of Māori facilitators and teachers who can deliver the programs in Te Reo Māori or incorporate Māori language and culture into the teachings.
- Flexibility in learning styles to accommodate different needs and ensure the program's capacity to support Māori students' success.
- Improved communication and collaboration between organisations working in the tech sector and Māori communities to ensure effective support and engagement.
- Addressing foundational literacy and numeracy rates among younger Māori students to create a strong educational foundation.
- Recognition and integration of Māori culture, language, and practices in tech education, including educating at the marae level and dispelling the perception of technology as a threat to Tikanga.
- Increased Māori engagement at all levels, including Māori students leading the education sector, employers actively seeking Māori staff and Māori starting and building tech businesses.
- Dynamic and up-to-date course offerings that align with the rapidly evolving trends in technology.
- Promoting financial responsibility and micro and macro education to build a culture of financial literacy among Māori communities.
- Focus on encouraging Māori participation in telecommunications, energy, and new transport sectors.
- Creation of more Māori-led tech programs in schools.
- Providing real-world experience opportunities to bridge the gap between education and the workforce.
- Increasing awareness of the diverse aspects of the tech sector beyond traditional IT and coding, emphasising creativity, artistry, hands-on skills, and empathy.
- Enhancing accessibility for rural communities and ensuring inclusivity for diverse attendee groups.

- Balancing tech education with nature-based learning to strengthen the connection to whakapapa and cultural roots.
- Removing the stigma around accepting assistance and instilling pride in the support provided, highlighting the contributions of tipuna (ancestors).
- Linking tech education to the ability to create Māori outcomes and addressing the importance of tech in advancing Māori aspirations.
- Starting technology education early for Māori children, especially girls, and providing access to necessary resources and funding for learning at home, marae, and schools.

Question 5. Would having an understanding of what kinds of jobs are available in the tech sector and what skills you could use motivate you to explore tech as a career?

It seems that there is a consensus among the responses that there is a need for more detailed and comprehensive information and guidance to navigate the path from initial interest to actually working in the tech sector. Māori leaders and professionals in the tech industry are seen as valuable resources to provide insights into various roles and career pathways, such as business analysts or scrum masters, from a Māori perspective. Having Māori role models and mentors in the sector can also play a significant role in inspiring and guiding Māori individuals interested in pursuing careers in tech.

While providing information and raising awareness about the tech industry is important, there is recognition that it should go beyond just promoting careers. It should also focus on highlighting the potential for a better life experience and the ways in which technology can be used as a tool to achieve personal goals and aspirations.

Additionally, addressing tech literacy and improving understanding of the industry among Māori communities is seen as a crucial barrier to overcome. This could involve providing more accessible and culturally relevant education and training programs that equip Māori individuals with the necessary skills and knowledge.

It is also suggested that lifestyle considerations and individual capabilities should be taken into account when guiding Māori individuals towards tech careers. By understanding their preferences and aligning career options with their desired lifestyles, it may help create a stronger motivation and commitment to pursuing careers in the tech sector.

Overall, there is a need for a holistic approach that combines comprehensive information, role models, culturally relevant support, and personalised guidance to enable Māori individuals to successfully navigate the steps towards working in the tech industry.

Question 6. If you were asked “What is Māori Tech?” how would you describe it?

- Showcasing Māori culture and heritage: Utilizing technology to share and preserve Māori stories, history, genealogy (whakapapa), sacred sites (wāhi tapu), and other aspects of Māori culture.
- Māori development and ownership: Promoting Māori-owned and Māori-led technology enterprises and solutions that address the needs and aspirations of Māori communities.
- Integration of Māori values and language: Incorporating Māori worldview, Tikanga (customs), and te reo Māori (Māori language) into technology and digital spaces, championing companies or staff who prioritize whakapapa, Tikanga, and te reo.

- **Digital sovereignty and identity:** Emphasising the importance of individual control over digital identities, data, and privacy, and exploring the concept of digital sovereignty in a Māori context.
- **Māori perspectives and unique approaches:** Recognizing the unique perspectives, experiences, and approaches that Māori individuals bring to the tech industry, which can contribute to innovative and culturally relevant solutions.
- **Māori-led innovation projects:** Encouraging Māori involvement in innovation projects, including Māori tamariki (children) and rangatahi (youth), to drive technology solutions that benefit Māori communities.

Question 7. What will active engagement in the “Māori Tech-Industry” mean for Māori?

It referred to the involvement, participation, and support of various stakeholders, including government agencies, industry leaders, educational institutions, and Māori communities, in promoting Māori representation and success in the tech industry.

The responses from the participants highlight the importance of having more Māori working in the tech industry, as it can serve as inspiration and encouragement for others to choose a similar path. It is seen as an opportunity to provide career opportunities, promote meaningful work, and contribute to the overall well-being of Māori individuals, families, and communities. There is a desire for Māori-led initiatives, pathways, and support systems that enable Māori engagement and success in the tech sector.

Additionally, there are calls for Māori cultural values, language, and perspectives to be integrated into the tech industry, and for initiatives that actively engage and inspire Māori tamariki and rangatahi through educational programs and workshops.

Overall, the responses emphasise the need for tangible actions and resources to create an environment where Māori can thrive and succeed in the tech industry, leading to positive outcomes for individuals and the wider Māori community.

Question 8. If you are based in a rural/isolated region, what support do you require to help the regional tech industry grow?

- **Improved connectivity:** Access to reliable and affordable internet services, including high-speed options like 5G, is crucial for businesses and individuals in rural areas to participate in the tech industry effectively.
- **Infrastructure and resources:** The availability of necessary resources such as communication networks, equipment, and technology infrastructure is vital for the growth of the tech industry in rural regions.
- **Funding and financial support:** Financial resources, grants, or funding opportunities specifically targeted towards supporting tech initiatives and startups in rural areas can help drive growth and innovation.
- **Education and knowledge sharing:** Opportunities for rural communities to engage in tech industry talks, workshops, and events led by experienced founders and experts can provide valuable insights, guidance, and inspiration for aspiring entrepreneurs.

- **Visibility and recognition:** Creating awareness among tech companies and organisations about the untapped potential and talent in rural regions is essential to encourage collaboration, investment, and support for the growth of the tech industry in these areas.
- **Local success stories:** Highlighting and celebrating success stories of individuals or businesses from rural regions who have excelled in the tech industry can serve as inspiration and motivation for others in the community.
- **Support for youth and education:** Providing funding and resources for initiatives like coding workshops targeted towards Māori families in rural areas can help build interest, skills, and opportunities for young people to engage in the tech industry.

Question 9. Do you agree with the diagram and the three priorities, which are: accelerated growth; strong foundations; and Māori participation? Why/Why not?

The responses indicate a range of perspectives on the Industry Transformation Plan (ITP) and its priorities. Some respondents express uncertainty or lack of understanding about the plan, while others see potential benefits in Māori participation, collaboration, and well-being. Here are some key points from the responses:

- **Understanding and Clarity:** Some respondents indicate a need for further clarity and analysis of the plan to fully comprehend its objectives and implications.
- **Government's Role:** There are differing views on the government's involvement in the industry transformation, with some expressing scepticism or concern about government intervention, while others emphasise the importance of prioritising people's welfare and collaboration.
- **Well-being Focus:** Several respondents emphasised the need for the ITP to prioritise well-being, including environmental and societal considerations, rather than solely focusing on economic growth.
- **Māori Participation:** Many respondents express support for Māori participation and collaboration in the tech industry, highlighting the importance of Māori-specific focus, skills development, and decision-making power.
- **Artificial Intelligence (AI):** One respondent suggests including AI earlier in the plan, indicating the potential significance of AI technologies in the transformation of the industry.

Overall, the responses reflect varying levels of understanding and opinions on the ITP and its priorities. There is a call for clarity, well-being focus, meaningful Māori participation, and consideration of emerging technologies like AI.

Question 10. What other work streams can include the Industry Transformation Plan to work for Whānau Māori?

- **Income Increase:** Some respondents mention that one of the goals of the ITP is to increase income, likely referring to the potential economic benefits and opportunities that could arise from the transformation of the industry.
- **Emerging Technologies:** The mention of upcoming technologies like the Metaverse suggests a desire for the ITP to address and leverage emerging tech trends in its strategy.

- **Financial Literacy:** One respondent highlights the importance of incorporating financial literacy into the plan, recognizing that understanding and managing finances effectively can contribute to the success and growth of individuals and businesses in the tech industry.
- **Cultural Competency:** Several respondents emphasised the need for cultural competency improvement across the sector, indicating a desire for the ITP to promote understanding, respect, and inclusion of diverse cultures and perspectives.
- **Collaboration and Tangata Whenua Engagement:** Respondents mention the importance of meaningful partnerships, collaboration with Māori (Tangata Whenua), and a Tangata Whenua first approach, emphasising the significance of incorporating indigenous perspectives and prioritising indigenous participation and decision-making.
- **Broad Scope:** Some respondents express uncertainty or a lack of clarity about the scope of the ITP and its potential to impact various sectors, including health and education.

Question 11. What other workstreams do you think should be included in the Industry Transformation Plan to encourage Māori engagement?

- Individualised support from a young age, particularly for economically disadvantaged children.
- Corporate responsibility in providing resources for Māori training and employment.
- Māori organisations and individuals reaching out to engage Māori in the tech industry.
- Incorporating Māori cultural elements into training and employment initiatives.
- Providing internships and exposure to businesses for Māori youth.
- Te Tiriti-driven outcomes, including meaningful partnerships and cultural competency.
- Rangatahi (youth) encouragement as a focus area.
- Comprehensive approach addressing all workstreams.

Question 12. The report noted that larger companies in the sector are keen to support a pipeline of Māori and Pacific Peoples talent in the sector and face challenges connecting and guiding cohorts of students or young Māori into their businesses. Do you agree? Why do you think this is?

- **Individualised Support:** Several responses highlight the need for heavily resourced 1:1 support for Māori from a young age, particularly for economically disadvantaged children. This long-term support is seen as crucial to help them succeed in training and secure job opportunities in the tech industry.
- **Corporate Responsibility:** There is speculation about whether big companies struggling to attract Māori and Pasifika talent would be willing to invest in the expensive support mentioned above. Some respondents question whether these companies would be willing to provide financial resources to facilitate the necessary support for Māori students.
- **Reaching Out:** One respondent suggests that Māori organisations and individuals should reach out to Māori individuals who are already engaged in the tech industry. They note that

other ethnic groups actively reach out but haven't experienced the same outreach from Māori organisations.

- **Cultural Elements:** Multiple responses emphasise the importance of incorporating Māori cultural elements such as whakapapa (genealogy), matauranga Māori (Māori knowledge), Tikanga (customs), and te reo (language) into the training and employment initiatives for Māori in the tech industry.
- **Internships and Exposure:** Providing internships and early exposure to businesses is seen as a valuable way to introduce Māori youth to the tech industry, giving them firsthand experience and helping them determine if it aligns with their interests and aspirations.
- **Te Tiriti-driven Outcomes:** One respondent mentions the need for outputs driven directly by Te Tiriti o Waitangi, such as meaningful partnerships, collaboration with mana/tangata whenua, a Tangata Whenua-first approach, and cultural competency improvement across the sector.
- **Rangatahi (youth) Encouragement:** Encouraging and supporting young Māori is suggested as a potential workstream to focus on, recognizing the importance of engaging and empowering youth in the tech industry.
- **Comprehensive Approach:** Some responses express the need for all work streams within the plan to be prioritised and addressed collectively to ensure a holistic and inclusive approach to Māori engagement and success in the tech industry.

Question 13. “Companies are keen to support a pipeline of Māori and Pacific Peoples talent in the sector, however, they face challenges connecting and guiding cohorts of students or young Māori into their businesses.” Do you agree? If you agree, why? If you do not agree why not?

- **Develop Kaupapa Māori initiatives:** Create training programs and initiatives that are culturally responsive and grounded in Māori values, language, and perspectives.
- **Foster partnerships with Māori communities:** Build relationships and engage with Māori communities to understand their needs, aspirations, and barriers. Collaborate with local iwi, Māori organisations, and educational institutions.
- **Provide mentorship and role models:** Connect Māori students and aspiring tech professionals with mentors who can provide guidance, support, and inspiration. Showcase successful Māori individuals in the tech industry as role models.
- **Ensure cultural safety:** Create a safe and inclusive environment for Māori learners by incorporating cultural competency training and incorporating tikanga Māori practices. Address biases and promote diversity and inclusion within the organisation.
- **Financial support and scholarships:** Offer scholarships, grants, and financial assistance specifically targeted at Māori students to alleviate financial barriers and encourage participation in tech training programs.
- **Promote awareness and visibility:** Raise awareness about opportunities in the tech industry among Māori communities through targeted outreach, information sessions, and partnerships with schools and community organisations.
- **Internships and work experience:** Provide internships, work placements, and industry exposure opportunities to Māori students to gain practical experience and build their skills and confidence.

- Support networks and communities: Foster Māori-led tech networks, communities, and support groups where individuals can connect, share experiences, and collaborate on projects.
- Invest in Māori-led initiatives: Allocate resources and funding to support Māori-led tech projects and ventures. Encourage Māori entrepreneurship and innovation.
- Address systemic issues: Recognize and address systemic racism, colonisation, and structural barriers that may hinder Māori participation and success in the tech industry. Advocate for systemic changes within organisations and the broader industry.

Question 14. How do you think corporations and government agencies can retain Māori talent in their organisations?

- Seek feedback from both those who leave and those who stay to understand their experiences and reasons.
- Provide competitive salaries and opportunities for growth.
- Foster a respectful and inclusive workplace culture.
- Listen to and address employee concerns.
- Avoid generalisations and treat each individual as unique.
- Create safe spaces and prioritise well-being.
- Build strong connections with Māori communities.
- Offer employee share schemes.
- Develop cultural understanding and connect with employees on a personal level.
- Support Māori-led initiatives and provide meaningful work.

Question 15. “The Māori Technology Ecosystem is currently relying on Māori staff working in companies and across the sector to do the connecting, the inspiring, and advising. They are relatively few in number and are increasingly stretched, given the demands and the lack of resourcing.” Do you agree with this statement?

The responses provided a mix of “yes” and “not sure.”

Question 16. Why does the Māori Technology Ecosystem rely on increasingly stretched individuals, with limited resources, to do the connecting, the inspiring, and advising?

The challenges mentioned in the responses highlight various factors contributing to the underrepresentation of Māori in the tech industry. These factors include limited resources, lack of understanding or support from management, historical injustices, systemic racism, and the need for cultural alignment. Organisations and society as a whole must address these challenges through targeted initiatives, increased resources, cultural competency training, and creating inclusive environments that value Māori talent.

Question 17. What suggestions would you make to change this reliance on increasingly stretched individuals?

- Providing cultural competence courses for all staff and management to promote understanding and inclusivity.
- Training and supporting individuals who express interest in tech roles and helping them grow within the industry.
- Recruiting more Māori into tech roles to increase representation.
- Ensuring that Māori education is not taught in isolation but includes a global perspective and promotes global citizenship.
- Offering support to Māori individuals, such as covering the cost of time away and providing resources to implement their ideas and solutions.
- Involving Māori primary industries, iwi, marae, and hāhi (church) in tech initiatives and policy changes.
- Creating opportunities, funding, and career-focused programs in schools to encourage Māori participation in tech.
- Establishing dedicated support groups, organised and funded by government and organisations, specifically for Māori in the tech industry.
- Promoting a culture of whānaungatanga (kinship and connectedness) within organisations and upskilling everyone on Te Tiriti o Waitangi (Treaty of Waitangi) and Māori history.
- Increasing the number of individuals and organisations working in the tech space and providing funding for workshops, services, scholarships, and initiatives focused on Māori STEM and engineering.

Question 18. What do you think are the barriers to empowering Māori to participate in the Tech sector?

- The need for better communication from the tech industry to Māori, highlighting the benefits and opportunities available.
- Potential barriers such as financial constraints and access to the necessary equipment or technology hubs.
- The importance of understanding the breadth of what can be achieved in the tech industry and having the initial knowledge and skills.
- Challenging the perpetuation of cultural barriers through racist narratives.
- The influence of organisational culture and specific needs within the tech industry.
- The importance of inspiring and encouraging young people to explore tech careers and see themselves in that world.
- Vision, alignment, culturally safe spaces, relationship-building, fair pay, and flexibility as factors that can support Māori participation in the tech industry.
- The need for clear assistance pathways and accessible resources for individuals to navigate their tech career paths.

- Disconnection from both tech culture and Māori culture, lack of confidence, and limited support networks and experience among close family and friends.
- The impact of policies and the competitive landscape on Māori representation in tech.
- Limited availability of skilled teachers and courses, particularly in rural areas with fewer employment opportunities.
- The importance of raising awareness and dispelling misconceptions about the tech industry to attract more Māori talent.
- The enduring effects of colonisation and systemic racism on Māori participation in the technology sector.
- Lack of equal opportunities for Māori in government funding and contracts, perpetuating underrepresentation in the tech industry.

Question 19. What support do you think is required to provide the skills to enable pathways to full-time employment for Māori?

- The need for access to equipment and support in education settings to help Māori individuals succeed in the tech industry.
- The importance of providing training and upskilling opportunities to bridge the skills gap.
- Utilising Māori wānanga (educational institutions) as a resource for tech education and skill development.
- The value of school programs that ignite interest and passion for tech among rangatahi (young people).
- Prioritising experience and practical knowledge in addition to formal education.
- Developing partnered capability-building initiatives that involve collaboration between organisations.
- Creating dedicated Māori support programs within organisations, especially in government and large companies.
- Focusing on teaching the expectations and responsibilities of work to Māori individuals, providing early-stage support and mapping a pathway to employment and ongoing support.
- Implementing scholarships, grants, workshops, conferences, and innovation programs specifically targeting Māori in the tech industry.
- Providing financial literacy and business training skills to empower Māori in wealth creation and entrepreneurship.

Question 20. Why do you think there is a low percentage of Wāhine Māori in the industry?

- Perception of tech roles as being focused on things rather than people, which may deter some women from pursuing these careers.
- Early identification and support for individuals showing an interest in tech from a young age to prevent them from pursuing other professions.

- Challenging stereotypes associated with tech, such as the perception of it being for nerds or geeks.
- The potential impact of societal factors, such as early pregnancies, on career choices for some individuals.
- The need for greater promotion of tech as a viable career option for Māori and women.
- Addressing barriers related to the prevailing culture within the tech industry, which may perpetuate white, misogynistic, capitalist, or elitist ideals.
- Acknowledging the importance of father-daughter relationships and the transmission of knowledge and self-worth in encouraging women, including wahine Māori, to pursue tech careers.
- The existence of imposter syndrome and the challenge of navigating a field where self-promotion is common and feeling inadequate can be prevalent.
- The need for more scholarships, programs, and initiatives specifically designed to support and encourage wahine Māori in the tech industry.
- The historical lack of inclusion and support for wahine Māori in the tech space, including the absence of scholarships and programs targeted towards them.

Question 21. Why do you think many Māori Rangatahi aren't choosing to enter the industry?

- Lack of knowledge, connections, and resources, particularly for those from less affluent backgrounds, which can limit their ability to explore opportunities in the tech industry.
- Misunderstandings or misconceptions about what the tech industry entails, leading to a lack of interest in or consideration of tech-related careers.
- Societal perceptions that associate tech with being “uncool” or more appealing to “tough guys,” potentially deter some individuals, including women, from pursuing tech careers.
- Perceived difficulty or inaccessibility of the tech industry, leading some individuals to view it as too challenging or inaccessible for them.
- Limited exposure to tech career options and lack of representation, role models, or mentors to guide and inspire Māori and women in pursuing tech-related fields.
- The importance of nurturing confidence and providing supportive networks and resources for Māori and women interested in the tech industry.
- The need for greater integration of tech education and awareness in schools and the involvement of more Māori in tech-related fields.
- Financial considerations and the belief that construction or other industries may provide more immediate financial stability.
- The significance of raising awareness about the opportunities and diverse aspects of the tech industry, helping individuals understand that it goes beyond just coding.
- Limited knowledge and awareness of available scholarships and programs that could support Māori and women in pursuing tech careers.

Question 22. How can the education/training pipeline be changed to increase Māori participation (especially Rangatahi/Taitamariki/Wāhine) in the Tech sector?

- Increase advertising and promotion of tech-related opportunities, specifically targeting Māori and women, to raise awareness of the potential benefits and career paths in the industry.
- Develop education programs that are tailored to Māori learners, incorporating cultural elements and perspectives to create an environment that resonates with Māori and promotes engagement and interest.
- Showcase successful individuals who have reached the end of their tech journey, highlighting their achievements and the opportunities available within the industry. This can serve as inspiration and motivation for Māori and women considering tech careers.
- Explore different aspects of technology, such as programming, and emphasise the artistry and creative potential inherent in these fields, to capture the interest of Māori and highlight the beauty and power of technology.
- Ensure that efforts to increase representation in the tech industry do not undermine the unique advantages and strengths that Māori already possess. Recognise and celebrate the contributions and perspectives that Māori bring to the industry.
- Provide culturally relevant education and training opportunities through wānanga (traditional Māori learning institutions) to support the development of tech skills within a Māori cultural context.
- Engage in open and ongoing discussions to better understand the needs and perspectives of Māori and women in the tech industry, and seek their input and feedback to inform strategies and initiatives.
- Start cultivating interest and passion for technology at a young age through targeted programs, workshops, and camps specifically designed for rangatahi/tamariki/wāhine Māori.
- Share real-life stories and experiences from people working in the tech industry, showcasing a wide range of job opportunities and highlighting the pathways and milestones individuals can pursue.
- Foster partnerships and collaborations between tech industry professionals, educational institutions, and Māori organisations to provide resources, support, and mentorship opportunities for Māori and women interested in tech careers.

Question 23. Can you identify any other issues that need to be explored in the Māori Tech space?

- Encourage accountability for outcomes from the funding that is made available to support Māori in the tech industry. This can help ensure that the resources are effectively utilised and lead to positive outcomes.
- Foster stronger synchronisation between community leaders and digital leaders to align efforts, resources, and initiatives in supporting Māori in the tech space.
- Address the barriers to access, such as ensuring the availability of devices, high-speed internet, and personal computers, particularly in areas where these resources may be limited.
- Explore opportunities in emerging technologies like Web3 and ensure that Māori are actively engaged and represented in these spaces.

- Advocate for greater representation and recognition of Māori tech companies and individuals in awards and industry events. This goes beyond tokenism and should reflect the significant contributions of Māori in shaping the future of technology in Aotearoa.
- Start cultivating interest and skills in the Māori tech space from a young age by establishing after-school programs or initiatives similar to those available to Asian children learning engineering and coding. Providing early exposure and opportunities can help build a strong foundation and interest in tech-related fields.

Survey 4. Māori Tech Sector & Rangatahi: Environment Scan

Question 1. What does the Māori Tech Industry mean for you?

The Māori Tech Industry holds different meanings for individuals. It can range from a focus on work and financial opportunities to leveraging the universal field of technology with the distinct essence of te ao Māori. It emphasises the importance of representation for rangatahi (young people) and promotes Māori-owned tech organisations and businesses with a specific focus on Māori outcomes and products. It enables better employment prospects for Māori while fostering creativity, innovation, and the creation of opportunities within the tech space.

Question 2. And, if you were developing tech to help your whānau/te taiao (the environment) or to help make life easier what would you do/create?

Responses to the question of developing tech to help whānau/te taiao (the environment) or make life easier include a variety of ideas. These ideas include considering the cultural viewpoint in the design process, creating apps with unspecified purposes, developing apps and support systems for embracing degrowth and reducing environmental impact, exploring financial technology as an alternative to traditional banking, designing a communication app, considering automation to simplify usage, and an ambiguous response stating “not sharing.” These suggestions highlight potential areas of focus for technology development to benefit both the environment and daily life.

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