

Māori & Data

He Kōrero Kaupapa a Ngā Raraunga

Findings compiled on behalf of Digital Natives Academy
March 2022

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He Karanga | The Call

E ngā reo, e ngā mana, e ngā karangatanga maha

Tukua mai ki piri, tukua mai ki tata

To the many voices, the many powers overall to everyone out there.
Let's all come together.

Mauria ma ki ngā mate i ngā mate

Tangi tu mai, tangi rere mai, tangi tiwarawara, haere atu rā

Bring those of yours who have passed, so we can
Cry together.. So we can share in this loss.

E ngā mana orite o nga whānau whanui

Kawea mai nei o koutou whare kōrero

O te kupu, o te mātauranga

Kia whakamanawa ai

Te rere o te kaupapa nei

Now to us the family of the living.
Carry in your baskets of wisdom,
Your words and your knowledge.
So we can bring light into this realm

Ko ngā Atua

Ko ngā Tupuna

Ko te Tohunga Mātauranga

He tiaki he tiaki

From up above
To our ancestors
And all the ancient treasures
We shall protect, we will protect.

E ngā Pukenga Raraunga o Aotearoa

Whakarawiatia a koutou kōrero

Ki runga i ngā poupou o te whare kōrero nei

I turn now to the digital alchemists of Aotearoa
May your knowledge and wisdom
Warm the heart of this house

He whare aroha ki ngā tangata

He whare manaaki ki ngā kaitiaki

Tēnā, haere mai ra, e ngā iwi e!

A house with love for the people
A house that protects the protectors
So too, all we welcome.

Whakawhanaungatanga | Forming and maintaining relationships and strengthening ties between kin and communities

When Māori share breath and spend time to focus on an important issue. We first start by acknowledging our Atua (deities), our tupuna (ancestors), and our connection to the natural surroundings, from the mountain to the rivers, from the lakes out toward the ocean. We pay respects to those who have passed on, sending our love and sympathies to the mourning family before extending welcome to those gathered and to the subject under discussion.

Whakawhanaungatanga, a ceremony of familial engagement and exchange, allows each speaker the opportunity to return the welcome, to invite their Atua (deities), tupuna (ancestors), iwi (tribes) and whānau (families) into the discussion and to establish links and connections with fellow attendees. It is at this point, when you learn more about a person, understand familial connections, where their parents, grandparents and great-grandparents come from, that these connections evolve. We were reminded that *"when you meet me, you are also meeting my 10,000 ancestors who stand behind me, give me strength, give me guidance, inspire me each and every day"*.

He Kaupapa Ōrite | Introduction

Digital Natives Academy was invited by the Alan Turing Institute to look into the experiences of marginalised and minority communities in relation to data and AI development & deployment within our Māori community. This opportunity has been challenging and insightful. Within tight timeframes, we have collected a vast amount of material and methodological advice. It is said that small talks can have enormous value.

Ahakoā he iti, he pounamu

Though it is small, it is of great value

The team from Digital Natives Academy (DNA) consist of Potaua & Nikolasa Biasiny-Tule and Hemi Edwards. Potaua and Nikolasa are co-founders of DNA and have supported the growth of IT and digital knowledge in Māori communities for over 20 years. Hemi is the Māori Research Advisor for the Strong AI Lab at the University of Auckland.

DNA coordinated with Alan Turing Institute Research Fellows David Leslie (UK), Rosamund Roa Powell (UK) and Alicia Boyd (US). Working across continents and timelines has its own challenges, but the synergy and the open-minded nature of this project has allowed for the team to assemble a range of indigenous experts, technicians, academics, policymakers and youth in the data and AI space, and we are proud to present our initial findings.

Shortly into this project, our team realised that we needed to gather an advisory group who understood the complex nature of the project, could provide data and AI insight as well as the necessary cultural protection required for a project of this magnitude.

Therefore, we invited a small team of five leaders in their fields, to support our efforts as a Māori Advisory Group, Te Roopu Whakahaere Māori. Our roopu (group) includes the following:

- **Dr Karaitiana Taiuru** (Ngāi Tahu, Ngāti Rārua; Ngāti Kahungunu, Ngāti Hikairo Tūwharetoa, Ngāti Hauti, Ngāti Whitikaupeka, Pākehā), expert in Mātauranga with Science, Intellectual Property Rights, Digital & Data
- **Sara Cole Stratton** (Ngāti Hine, Ngāti Kahu), Founder of Māori Lab, Indigenous AI Ethics Expert
- **Caleb Moses** (Ngāpuhi), Data Scientist at Dragonfly Data Science
- **Te Aroha Grace** (Ngāti Whātua Ōrākei), Chief Relationship Officer at Figure Group
- **Dr Daniel Wilson** (Ngāpuhi, Ngāti Pīkiao), Professional Teaching Fellow (Data Science) at the University of Auckland

Ko te Hapai o Ki Muri

Ko te Amokura ki Mua

*When the people are well in the back
Then the leaders will go well in the front*

Basic context

In order to understand the findings of this work, it is necessary to have some background into the history of colonisation and colonial resistance in Aotearoa. For that reason, we include some points to explain the current situation regarding data and AI in Aotearoa, as we see it.

- Indigenous communities care for ancestral knowledge that is precious. It holds ancient genealogy, legacy & wisdom, contains cultural and customary understandings, is communally owned but has parameters and custodians specific to each knowledge systems, relative to specific areas;
- There is significant interest in Indigenous knowledge systems from governments, research academies, industries and global corporations around the world;
- The impact of 600+ years of European expansion and 200 years of British colonisation in Aotearoa New Zealand has shaped Māori perspectives on data & AI.
- Indigenous communities across the planet (370-500m¹) are at different levels of data understanding, community-led AI development & deployment and imbuing indigenous knowledge systems into the digital world.
- Māori have a unique way of talking about data that starts with cultural, spiritual and trust-based relationships. These discussions are values-led and values-based, which allow for organic conversations and a dynamic free flow of Māori-inspired frameworks.
- Māori have experts in this space (academics, developers, innovative thinkers), with diverse backgrounds who hold a deep knowledge and have spent decades

¹ <https://www.worldbank.org/en/topic/indigenouspeoples#1>

developing a rich area of scholarly research in the area of Māori and data. And as a result, thinking about these issues is not new.

Historical context

Māori have a distinct colonial experience in that Rangatira, notable chiefs, first signed He Waka minega o Nu Tireni, The Declaration of Independence (DOI) in 1835, and then again with Te Tiriti o Waitangi (TOW) with representatives of the British Crown. In the short decades that followed, the settler population grew and pursued English hegemony over New Zealand by waging war, confiscating land, and implementing language and cultural suppression, pushing Māori to the brink of survival by the start of the 20th Century.

The enduring belief in the vision our tūpuna (ancestors) had of new horizons for us as Māori, and in the upkeep of Te Tiriti o Waitangi, right through to the present day, means in 2022, over 700,000+ people whakapapa (link through genealogy) to Māori ancestry. Though our story of resilience and revival has had more than its fair share of suffering and struggle, there is a new dawn of optimism as whānau (families) lift their aspirations, hapū (subtribes) begin to look after each other and iwi (tribes) present more positive Māori paths, positions and lifestyles for future generations.

Much like our land and our language, Māori data has been controlled by external forces for nearly 200 years. From the introduction of European numeracy and literacy, the slow erosion of Māori methods of calculating, counting and organising figures gave way to the pencil, the paper and western systems of thinking. With the growth of global trade and the establishment of a Settler Government, the numbers have always been in favour of Pakeha-Europeans, and used as negative markers against Māori communities; even today, the plethora of negative Māori social statistics is readily available.

What was required for this research project was first, an appreciation and respect for ancestral knowledge and customary indigenous practices that have been handed down from generation to generation in an unbroken line; this allows for a deep, meaningful conversation. Upon that ground of indigeneity came the layer of colonial experience, both the trauma and the good, which can often be lost in the timeline of authentic storytelling. And then a move into these modern times where Māori have a greater appetite for progress and an aspirational view for where technology can take our culture, and importantly, how culture, especially indigenous cultures, might enhance the global internet over time.

In 2022, over 700,000+ people have Māori ancestry and though our story of resilience and revival has been had more than its fair share of suffering and struggle, there is a new optimism as Māori lift their aspirations, hapū begin to look after each other and iwi present more positive Māori paths, positions and lifestyles for future generations.

The struggles and the tensions are many, from the difficulties felt within a Eurocentric tech community here in New Zealand, to the lack of direct support from Government, it's Ministries and Agencies through to the data and privacy issues Māori face with social media giants like Meta and Alphabet. The Māori Data & AI leaders we spoke to during this research traverse many of these complexities and challenges when dealing with

Government, and increasingly, with global corporates. Their insights are but an iceberg of a larger conversation that is happening beneath the surface.

Māori Data Sovereignty

In the Aotearoa context, discussions of Data Justice overlap heavily with the established term here, which is Data Sovereignty. Established in October 2015, the Māori Data Sovereignty network has advocated for the rights of Māori in this space and over time the term “Data Sovereignty” has gained some traction both with the public and private sector.

For this reason, we include a definition of Māori Data Sovereignty here, again to provide helpful context for the discussions to follow.

The Principles of Māori Data Sovereignty defines Māori data as follows:

“Māori data refers to digital or digitisable information or knowledge that is about or from Māori people, our language, culture, resources or environments.”

While Māori Data Sovereignty is defined as follows:

“Māori Data Sovereignty refers to the inherent rights and interests that Māori have in relation to the collection, ownership, and application of Māori data.”

Sacred knowledge is data, whether in the first utterance by an opening speaker, a sacred chant, or in a conversational AI trained via machine learning on sacred data. Māori have collected and utilised data since time immemorial - through chants, carvings, weaving, the written word and now code.

The following section helps to detail the relationship, spiritual and cultural that Māori have with knowledge/data.

Epistemologies of Māori Data

Ngā Kete o Te Wānanga | Three Baskets of Knowledge

In Māori cosmology, all things relate back to the spiritual realm, Te Ira Atua (woven mat that allows for diverse patterning depending on knowledge bases, beliefs, and values, which all may stand upon), and the spiritual connection between all things seen, unseen, known and unknown. Kei te whai Ao (coming into the light) ki te Ao Marama e. (Harmsworth, Awatere, 2013).

As Earth Mother, Papatūānuku, provides sustenance on the land, Ranginui the Sky Father looks down from above. Between these two celestial parents, their children spread out to embody the seas (Tangaroa), the winds (Tawhirimātea), the forests (Tāne Māhuta), volcanoes (Rūāumoko) and the uncooked fern (Haumiatiketike). These Atua (deities) are considered the first Māori whānau (family), from where our kawa (ancestral understandings) are set down and from where we start this journey (Taiuru, K. 2018).

Ngā Kete o Te Wānanga is a Māori metaphor based on the 3 baskets of knowledge:

- Te Kete Tuatea - The basket of light, of present knowledge
- Te Kete Tuarua - The basket of darkness, of unknown knowledge
- Te Kete Aronui - The basket of pursuit, of revealed knowledge

One story tells of Tāne Māhuta, the God of the forest, seeking the three baskets from within the higher realms of understanding. Along the way, Tāne was able to secure **Te Kete Tuatea**, which related to the creation of the natural world and the patterns of energy that operate behind the world of sense perception. **Te Kete Tuauri**, which was the basket of ancestral knowledge of agriculture, tree or woodwork, stonework and earthworks, war and evil. The third basket, **Te Kete Aronui**, pertained to knowledge acquired through careful observation of the environment, ritual, arts, literature, philosophy and people.

This flow of knowledge from the celestial into the lived experiences of our ancestors (ngā tupuna), created that bridge between the knowledge of the spiritual and the practicalities of the times. In a communal society that celebrates Te Ira Tangata (the realm of people), the acknowledgement, appreciation and respect afforded to spiritual awareness allowed Māori the insight, awareness, foresight and boldness to access the vast Te Moana Nui a Kiwa (Pacific Ocean), and to utilise innovations in transportation, in navigation and in communication.

From our original home of Hawaiki, our tupuna (ancestors) set off on one of the longest voyages in history to create new beginnings for themselves, and for future generations.

Using Māori narratives in these larger discussions opens up a series of processes, systems, structures and frameworks that could be used when working with Māori communities specifically, and potentially with indiegnous communities around the world.

Te Kete Tuatea | The Basket of Light, of Present Knowledge

Ko te Kore

Ko te Po

Kei te whai Ao

Ki te Ao Marama!

From the Chaos

To the Dark

From the Potential

Into the World of Light!

Our DNA Team and the Māori Advisory Team met over a number of online sessions and the following feedback was received:

- Multiple Cultural Red Flags went up; Who was asking for Māori data? For what purpose? Why now? Can we trust this group from the UK with our knowledge? What will happen with the data?
- The questions being asked and the style being put forward look western, smell colonial and have aspects of cultural harvesting, with the potential for unauthorised commercialisation further down the track.
- This project, for it to be successful in Māori communities, needed to have greater re-alignment with Te Ao Marama, a Māori Worldview, to have a better understanding of Mātauranga Māori, Māori knowledge and to respect a Kaupapa Māori framework, philosophy and underlying pedagogy.
- What would be a more Māori way of indigenising this research project? How could this mahi, this task, be done in a more Māori way? (which may not follow what was prescribed but has the ability to gain far more fruitful discussions and insights).
- With the list of potential interviewees, a high level of trust is required, as the wrong thing said by the wrong person will ensure that no one will share their knowledge.

With guidance from our Advisory Group, our team went away and returned our thinking back to the way of our tupuna (ancestors), and the examples they have set down before us and developed a completely new approach to how we would seek feedback from our community, which involved taking on a Kaupapa Māori (doing things the Māori way).

Kaupapa Māori / Māori Research Methodologies

Taking an approach rooted in indigenous epistemologies and pedagogies is essential (Blackstock, 2007), as it allows researchers and participants to stay culturally and spiritually safe. This prompted the decision to draw together an Advisory Board of Māori AI/Data experts, practitioners and thinkers. We needed a space to critically discuss the underlying premises of the report, such as the meaning and relevance of 'Data Justice' to our unique context.

We utilised a Māori academic approach including the wānanga methodology. Wānanga is the practice of open and inclusive discussion, and is the traditional way that we share and build upon each other's expertise. Wānanga also guarantees a safe place for participants to share their insights.

Kaupapa Māori Research refers to an approach, framework or methodology for thinking about and undertaking research about a Māori topic. Kaupapa Māori research draws on a range of influences such as:

- Historical Māori experiences with, and perceptions about research
- Māori perspectives about the world
- Māori values and expectations around ethics
- Māori cultural values and practices
- Māori knowledge

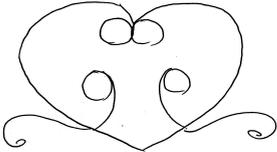
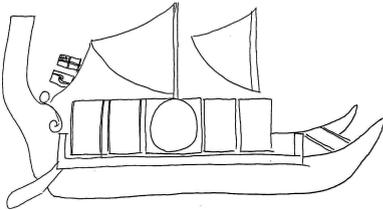
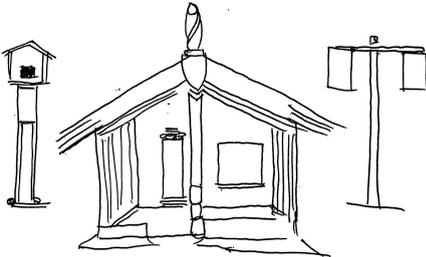
- The place and status of Māori people, language and culture in society and the world

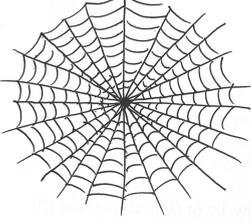
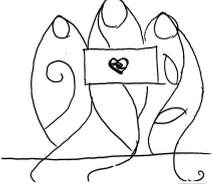
In essence, this is doing things the “Māori Way” (Smith, G. 1992, Smith, L. 2015). It allowed us to explore key ethical considerations, key cultural responsibilities and intergenerational obligations as well as how we could frame and conduct our interviews in a way which held true to indigenous Māori ways of being and doing. This ensures that we speak with the person, not over them.

Our approach is inspired by Māori philosophy and principles, and presents a uniquely indigenous framing of the world. It takes for granted the importance of te reo Māori (Māori language), tikanga (cultural practices) and wairua (spirituality). This framing allows us to present our values with authenticity and integrity.

Toi Kōrero | Visualising Frameworks

From this work emerged a new framework which more closely reflects Māori understandings of the world and which is now being used as part of a larger conversation. We developed a series of concepts, represented with images to focus the minds of the participants. This allowed us to communicate how we shared this journey and what was being asked of them.

	<p>Ko te Whānau Aroha Represents our DNA whānau and the spirit in which we started this research project, the relationships established and our heart for this kaupapa (purpose).</p>
	<p>Ko te Waka Raraunga Represents a double-hulled sailing vessel that our ancestors used to circumnavigate the Pacific ocean and is used to signify a journey, a crew, a cargo, a destination.</p>
	<p>Ko Te Marae Represents a wharenui, an ancestral house where people gather to share, to cry, to celebrate, to talk. On the right is a pataka, which is a storehouse for taonga (treasures) and for food; and on the left, a niu/haaki pou, a sign of mana motuhake (self-determination), local esteem and authority.</p>

	<p>He Mawhaiwhai o te Pūngāwerewere Represents a spider web that signifies both the interconnectedness of the internet but also an awareness that webs often catch indigneous knowledge which can go on to feed spiders, both large and small, suggesting that we should proceed with caution while being appreciative of how structures can nourish us.</p>
	<p>Ko te Whānau Aroha Represents our team and the love we bring to the project. Drawing from the three baskets of knowledge, it is the past, the present and the future of Māori.</p>
	<p>Ko Te Waka Huia Represents a carved heirloom box constructed to keep treasures safe and represents this report.</p>

Katahi te piere nuku ko tēnei.

This is indeed a difficult task.

He Taonga Tangata | Demographics

People are a treasure and within a Māori worldview, are all connected through whakapapa (genealogy), to Atua (deities), to our tupuna (ancestors) and to each other. These intergenerational relationships have been weaved through space and time, creating a living interconnected network of whānau (families), hapū (subtribes) and iwi (tribes).

Between our DNA team and the Māori Advisory Group, we gathered a list of participants who are acknowledged leaders in the area of data and AI. The following provides a snapshot of who was involved:

Participants

Our participants came from a range of backgrounds, including 42.9% (15) who identified as developers, 40% (14) who identified as community leaders and 17.1% (6) who identified as policymakers.

Education

Our participants identified with the following educational levels, 40% (14) had completed post-secondary school education, 37.1% (13) hold advanced degrees (including Masters,

PhD or equivalent), 11.4% (4) had completed some post-secondary school, 5.7% (2) have completed secondary school, 4.8% have completed some post-secondary school education and 5.7% (2) have no formal qualifications.

Experience

Participants' experience was measured in levels of familiarity with data and algorithm-related technologies. 37.1% (13) were moderately familiar, 20% (7) were very familiar, 14.3% (5) were extremely familiar, 25.7% (9) were slightly familiar and 2.9% (1) were not familiar.

Te Kete Tuauri - The Basket of Darkness, of Unknown Knowledge

Mai te Atua mo te Karakia Mai te Karakia mo te Atua
Our Connection; Our Call, Our Call, Our Connection

Research is an investigation into the unknown; it is observation, conversation, reading and documentation, methodology and analysis. Much like any journey, there is a certain amount of preparation that is required before the actual voyage is undertaken; for Māori, this involves the spiritual, the cultural, the physical, the collective and the personal.

With an updated and reformatted plan, our team was ready to embark on a more Māori-centric process that could truly hear the raw stories and lived experiences of our Māori data & AI community.

Findings

Māori Macro

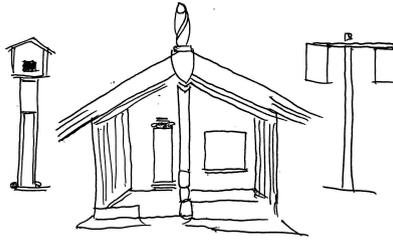
- Data is a hot topic for many Māori communities but the long-term effects of Covid-19 have stalled many efforts that had been initiated in recent years and the community focus is now on preventative and resilience care;
- Data issues are at the forefront of Māori communities at all levels; from tribal organisations not being able to access tribal member data from government agencies to the lack of involvement and meaningful participation of local communities to design, implementation and monitoring of smart systems;
- Māori thought is being heavily drawn upon by government, NGO and industry as a means to strengthen their obligations to Te Tiriti o Waitangi (the founding document signed between the British Crown and Māori in 1840), to bolster diversity and inclusivity goals and to access key Māori knowledge, insights and networks throughout the Māori community.

For Māori, data is more than a series of aggregated numbers; it holds the essence and life force of a person and of nature. Data has a mauri (an essence of being), data gives (and takes away) mana (authority), data is a treasure - for Māori, data is a taonga (a treasure).

Project Macro

- The ability to access shared knowledge, lived experiences and professional opinion requires first a high-level of trust, which helps to create meaningful conversations and develops a relationship where each party can share, care and respect each other's exchange. Māori communities are values-based and once trust, respect and care are established, a great deal of information can be shared and reciprocated in equal exchanges.
- Primary thoughts received indicated that while the framework around the pillars of Data Justice were important, our own community wanted to design a conversation that spoke and exhibited discussion around key themes that were important to Māori communities; it was agreed that Data Justice and the UN SD Goals were significant, but the existing framework as is limited discussion, predetermined the flow of thought and therefore could only give superficial answers. What has emerged is a reformulation of a more indigenous framework that sits at the intersection of real and raw lived & personal Māori experiences.
- The goal has been on designing a theme-focused conversation that shares, cares and examines personal experiences of our participants, but also calibrates, captures, critiques and challenges the assumptions we enter with based on their own lived fears, dreams, hopes and aspirations.
- We are preparing cultural safety protocols, such as the use of karakia (incantations) as some stories may trigger deeper personal emotions, spiritual harm or cultural trauma like colonisation, modernisation and now virtualisation.
- Māori do have a unique set of insights, knowledge (Mātauranga Māori) and experiences in data and the AI area, and do want to be able to tell our story, in our words, in our way. Having faced 200 years of colonisation, there is always a natural caution when being asked to share knowledge without prior relationships, understanding of each other's cultural perspectives, where that knowledge might be housed and stored and what is to come of that knowledge once given.

For Māori, justice is a word that has never been applied fairly. Our word is tikanga, which is the ability and act of doing things in a correct way.



Interviews

Ngā Kupu Kōrero | Establishing Māori Terminology

Te Reo Māori (the Māori Language) is the indigenous language of Aotearoa and is central to Māori culture, identity and forms part of the heritage of our country. Each word (kupu) has a meaning and a whakapapa (genealogy), which links to a time, place, action, moment, people.

The overarching view from contributors is that data is precious, it is valuable and it requires protection from people with dedicated expertise. Data is also deeply connected to places, people and living things which all have value and so it also has value. As such, the Māori world view encompasses a distinct way of thinking about data and our relationship to it.

Participants reminded us to think about where our intelligence comes from? From a Māori perspective, it comes from our Atua (deities), our tupuna (ancestors), our kaumātua (elders). Our intelligence comes from more than just our brains, it comes from the living knowledge that has been handed down to us from those generations that have come before us.

Our Māori Advisory Group suggested that we begin with our language, so we selected a number of culturally significant words and started our conversation by asking the following question:

Which words stand out, which words are missing and how do you interpret these kupu within digital spaces?

Taonga Treasures | **Atuatanga** Gods | **Tūpuna** Ancestors
Mana Authority/Respect | **Mauri** Life Force | **Tapu** Sacred | **Noa** Common
Utu Reciprocity | **Muru** Restorative Justice | **Tikanga** Cultural Protocols
Pono Truth/Sincerity | **Wairua** Spirit | **Manaaki** Caring for others
Kaitiaki Guardian | **Mātauranga Māori** Indigenous Knowledge
Taiao Environment | **Māramataka** Temporal Cycles
Mana Motuhake Self-Determination | **Matihiko Raraunga**

The translations provided with the question are indicative only. In reality these words are tightly linked, and this nuance is well understood by our interviewees, who are from Māori communities. We hope that the discussion summarised below provides a better understanding to the reader.

Responses from participants emphasised the following words: mana, tapu, noa, utu, tikanga, kaitiaki, wairua, taonga, pono, mauri, and whakapapa.

Mana is an encompassing term for power and authority. It originates in the enduring power of the Atua (deities), and the person is always the agent, not the source of mana. A person can build up their mana over time by maintaining good standing with their community.

Likewise, data is also acknowledged by participants to have mana. This means that data commands respect and proper treatment in accordance with ethics.

Tapu is a state of sacredness or prohibition. In traditional custom (**tikanga**), tapu is placed on an object or place to indicate it has been set aside for a particular purpose. Tapu is also contrasted with **Noa**, which is the state of ordinary and unrestricted. Protocols exist to transition objects from noa to tapu, and backwards as required.

Participants acknowledged that data also exists along the tapu/noa spectrum. That is to say, data requires protection and protocols to keep it safe.

A **kaitiaki** is a guardian who is entrusted with caring for something of value, such as the environment. In the context of data and AI, people who hold knowledge are also regarded as kaitiaki. This is not limited to knowledge in one's own head, but crucially includes archivists, and practitioners of traditional knowledge, such as navigators.

Wairua is the non-physical spirit, and emphasises the spiritual dimension of the human being. Unlike in western culture, Māori do not draw a strong divide between the physical and the spiritual realm. Instead it is understood that humans have a spiritual element, and this is not denigrated as a concept.

Mauri is the life force, or essential quality and vitality of an entity. It implies a connection to the living, and implies maintenance. People, communities and ecosystems all have mauri. The community has a responsibility to recognise and maintain the mauri of their surroundings. Doing so builds mana.

Data inherits mauri from the people and ecosystems it represents. The mauri of a data system also implies the existence of processes to maintain and guarantee its quality.

Taonga refers to treasured possessions. Data certainly has value, and therefore is regarded as a taonga. However this value is not derived from economic value, but rather in recognition of the value of the taonga that it represents. We record data about valuable things such as people and the environment, and so that data has value which is derived from those things.

What is considered taonga can be relative. What is taonga to one person may not be considered taonga to another. So we also place emphasis on rightful ownership, which ensures that those taking care of a given taonga are also those who are most invested in ensuring it flourishes.

Pono represents truth and genuineness. In the data and AI world we collect data because it is a reflection of the real world.

Whakapapa refers to genealogy. In the Māori world, people build connections by identifying shared ancestry. Therefore, whakapapa is a foundational concept in the Māori worldview.

Data is also understood as having a whakapapa, which consists of the relationships that tie it to the real world.

Whakapapa also represents causality, in the sense that causes precede effects much like parents precede their children. So Māori often discuss whakapapa when identifying the underlying causes of an event or process.

Data Rangatiratanga | Data Governance

We chose the question below to link traditional, customary practices with the advent of colonisation, Governmental legislation and the subsequent continuation of global trade agreements, such as the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the Comprehensive Trans-Pacific Agreement (CTTPA) and the General Data Protection Regulation (GDPR).

Tūpuna Practices | He Wakaminega Rangatiratanga o Nu Tireni | Te Tiriti o Waitangi | WAI 776 | WAI 2522 | UNDRIP | Global Tech | GDPR

What do you know and understand about these kaupapa, in the past, present and future? Do they impact and in ways have they impacted our ability to hold rangatiratanga over our own data?

Ancestral methodologies: Contributors emphasised how our ancestors collected and shared data across generations. This allowed them to develop new technologies that ensured our continued survival in Aotearoa in a process which has continued to the present day. This process of intergenerational transfer is mediated via wānanga, and other processes which ensure the integrity of that knowledge.

Systems of control: There is an awareness around UNDRIP and GDPR that is replacing the previous view, which was that these are an 'overseas thing'. Still, Māori see these things and more broadly the large organisations they sit under as a western system of control. Sceptically, some contributors felt "data justice" is about the control of data for the purposes of western countries. Within an indigenous framework, it was felt they have little meaning and are not useful to Māori communities.

Data is a difficult concept: Contributors felt that data is a difficult concept for most people (not just Māori). So a lot of people give up control over their own or other people's data. In some cases this can be because of a lack of alternatives. It was acknowledged that the largest digital space currently holding Māori data is Meta/Facebook.

On the other hand, control over data can also be given up in support of 'Open data' initiatives which are set up to benefit the majority at the expense of small communities.

**Kia hohonu te ruku i nga whakamarama o nga kupu nei,
kia kaua noa iho tatou e mohio ki te kahu o te wai.**

Let us submerge ourselves deep within the explanations of these words, so that we don't just know the surface of the water.

Kōrero Ture | Justice

Having set the context for the discussion by talking about the topic of data in our own terms, we aimed to directly address the issue of data justice in this section. To that aim, we asked contributors about their opinions on the term, and its relevance to Māori communities.

To achieve this, we presented the proposed six pillars for the data justice movement and asked them the following questions:

What does 'Data Justice' mean to you?

Is it relevant to Māori communities, to Māori devs?

Do the kupu below have meaning/a place within a Te Ao Māori worldview?

Are they meaningful/useful in understanding how to work within our communities?



Power



Equity



Access



Identity



Participation



Knowledge

At this stage of the interview, the participants drew upon cultural protocols to offer critical analysis based on personal experiences and professional stories.

A number of criticisms and corrections for 'Data Justice' and the six pillars were proposed by our contributors.

Data Justice criticisms: Contributors felt that the pillars were too generic and that they treat everyone as if they are the same. While equality is important from a western perspective, so is diversity. From the perspective of minority communities that are at an elevated risk from data injustice, the term and also the pillars appear foreign.

It was also said that the term "Data Justice" also feels too neutral. To whom is access being provided is of paramount importance. It is not sufficient to respond 'access is for everybody' because such terms are always stated relative to an unspoken default. Our contributors challenge the reader to consider who that default is.

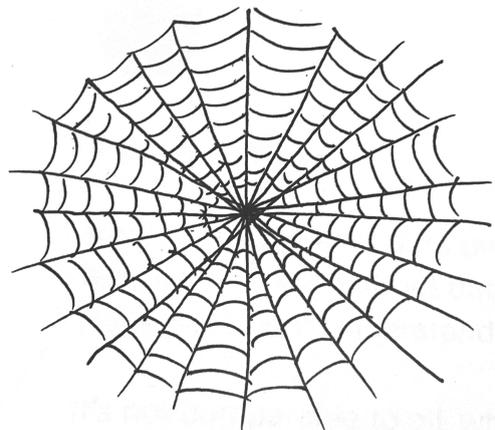
Data Justice corrections: Contributors were able to describe a consistent vision of what Data Justice means from a Māori perspective. Namely, that the life force (mauri) collected by any data is treated with care and respect. This means treating the people who make up the data you collect with respect. Permission must be obtained from each person for access to any data pertaining to themselves and their family.

Data Sovereignty: Sovereignty describes the supreme power and authority to conduct ones own affairs. In Aotearoa, Māori discuss issues of data justice in the context of the Data Sovereignty movement. Our contributors felt this was a more sensible way to discuss data justice during our interviews because it is a terminology that they are already familiar with.

All matters of Data Justice involve a power imbalance between the exploiter and the exploited, so why not make that imbalance the centre of the conversation by calling it the problem (as 'Data Sovereignty' does). The alternative 'Data Justice' brings up memories for Māori of court systems which have done and continue to do massive damage to Māori communities.

**Ehara i te mea ka whare pūngāwerewere ka hanga i te
rā kotahi. Ka roa koe e whakapaipai anā, katahi ra anō
ka ataahua.**

*It will not look like a cobweb in one day.
It takes time working on it until it becomes beautiful.*



Our team recognised the high-calibre of interviewees and so presented the following set of questions to gain specific knowledge, experience and insight into data and AI practices within the Māori community.

Te Waka Huia | The Box of Treasures

Next, we wanted our contributors to consider how we might plan and guide the next generation of indigenous developers, so we asked them the following questions:

How would you co-design and create a guide for Indigenous Developers?
Would it be the same for Māori Developers?
And for Developers working with Indigenous (especially Māori)
Communities?

In our responses, it was widely agreed that a guide for indigenous developers would include a great deal of information not specifically related to technology. Here are some points that our contributors felt were especially important.

From the gathered discussion, it is clear that Māori want to not only be involved in the process but that it needs to be “by Māori, for Māori”.

Key themes to emerge include the importance of culture, of allowing Māori to develop the following:

- Their own questions.
- Their own frameworks.
- Their own methods for determining where they fit, and what needs to be done and how it needs to be done.

Indigenous developers don't want to be “invited into the tent”, they want to not only be part of the team who determine the design of the tent, they want to be part of the discussions which determine if it's a tent that should be constructed in the first place.

Prioritising decolonisation: Decolonisation needs to be at the centre of a guide for developers. There should be an understanding of the colonial history of Aotearoa, taught from a Māori perspective.

The technologies that developers make have an impact in a world that has already been shaped by colonialism, and the goal is to teach people how that process has unfolded so they can better understand their place in it and also how to detect its influence in their own work.

Storytelling is key: Māori are excellent storytellers, and much of our cultural knowledge is intertwined with the stories we use to share our culture with one another. Learning and composing new stories that convey the information we wish to tell is an engaging and authentic way to pass on information. Doing things this way also creates an opportunity to bring in knowledge from our ancestors and recontextualise it for a modern audience.

Different audiences: Our contributors also understood that there would be a diverse audience for an indigenous developer guide, and so there should be resources prepared for the different groups that make up the tech industry. Some contributors carved up the audience along different lines, such as developers vs community or māori and non-māori.

Te Riu | Key Themes

In this section, we asked a sequence of six questions and summarised their responses into a short number of key themes. The first question was:

1. How can we incorporate the distilled wisdom of our tupuna into AI systems in a culturally appropriate way that is consistent with Tikanga Māori to make more effective decisions and relieve ourselves of reliance on Pākehā (European New Zealanders) and Tauwi (International migrants) domain experts?

Key themes:

Māori expertise: Many contributors commented on existing protocols we have for building complex systems. These are in use in our Marae (Meeting houses) and inform how other Māori initiatives are run. They also emphasised the need for a 'by Māori for Māori' approach to building culturally appropriate data and AI. There is also a need for further capability building to train more culturally competent Māori technology experts.

Focus on data: New technology is always a concern for Māori. There is a level of fear and anxiety over the development of technologies, and because of past injustices many Māori families are concerned with loss of control over their own affairs.

Think holistically: Māori like to emphasise a holistic, long-term approach to problem solving. Contributors want frameworks that are relevant to families and serve an intergenerational purpose.

2. What actors hold power and influence over the collection and use of data in your community and are there any power imbalances that create imbalances? What were their interests in collecting and using this data?

Key themes:

Government agencies: Contributors acknowledged the massive amount of data on Māori communities that is stored and collected by government agencies. In these arrangements, data is rarely shared with Māori except under the pretence of open data. This is problematic because Māori are supposed to be partners with the government, and not simply regarded as the 'general public'. In the past year, this issue has come to a head on the topic of Covid-19 immunisation data.

Foreign corporations: Secondly, Contributors acknowledged the vast quantity of data possessed by major multinational corporations via social media and other institutions. There

are movements to protect cultural data by keeping it on-shore, in keeping with the Data Sovereignty movement. However with the major data centre companies located off-shore it becomes basically impossible to stay up to date while keeping data within our borders.

Academic and research institutions: Many Māori technologists also work with archival data, collected by libraries, museums and universities. Often this collection is carried out by non-māori with the purpose of studying and documenting māori. As such, although there are many 'open data' policies in place that permit the use of such information, in reality the ownership is unambiguously in non-māori hands and cannot be transferred elsewhere.

3. How do we best engage with our people to consult with Māori in our communities about what they think about the value of AI technology, their fears of potential abuse and harm, and hear their views of what they envisage as the most exciting possibilities and the most useful applications of the technology?

Raise awareness: There are still many Māori communities with limited access to the internet, let alone artificial intelligence. For those of us who are working in the industry, there is an opportunity to raise awareness of the opportunities coming from these new technologies. Building community must come first, before building the technology. Part of the problem with social media is not everyone understands the risks of engaging with those platforms and how to mitigate them. By reaching out proactively we can treat other issues such as disinformation and so on.

Resource Māori to engage: Because of a lack of access to technology, Māori need to be resourced to improve engagement with AI. This could look like funding to train new Māori tech experts, and also partnering Māori organisations with problems with others who may be able to offer solutions. For as much scepticism there is surrounding new technologies, there are also many Māori innovators who are keen to jump onto new opportunities if they look promising enough.

4. Are choices made by technology developers and implementers to acquire and use data equitable, ethical, and justifiable?

Widespread ignorance: The vast majority of technology developers are not from minority communities, and this results in the well understood inequities that form the basis of the data justice movement.

There is a lot of ignorance of what constitutes harm among such developers. You will find many developers in the real world who feel that harm is ok if it only affects 'the few', without acknowledging how these harms compound and perpetuate existing historical issues.

Broken systems with broken goals: On the other hand, there are also AI developers that are doing their best. However, many are operating inside of systems with structures that minimise the positive impact of any single well meaning developer.

Even if an individual developer is trying very hard to make ethical algorithms, if the core mission of the organisation is not sound then it can be impossible to build an ethical system in practice.

Critique the core mission: The proposed solution to these issues is often stronger, transparent and democratically driven governance models. Still, the ethics of the core mission is critical. Many AI ventures are impossible to save with any governance model because the core premise is the unethical part, not the algorithm specifically.

5. How could Māori provide a unique contribution to the development of AI technologies including a values framework informed by Te Ao Māori?

Proposing our own frameworks: Contributors emphasised the need for our Māori to build new frameworks for AI technology development. This would provide an opportunity to introduce our values into the process and operationalise them.

Challenging assumptions: The thing is that many well meaning initiatives are doomed from the start because they are based on a narrow, colonial view that over-emphasises the individual and de-emphasises the spiritual, metaphysical dimension of all human beings in favour of post-enlightenment ideals.

Favouring connection: In the Māori worldview, the fundamental unit of human being is the whānau (family). Māori understand that nothing in this earth was created to exist in isolation. However, the current western paradigm treats the world very differently, instead seeing it as a collection of individual, unconnected pieces. When you understand this, you realise there is a wealth of opportunity and latent progress to be made.

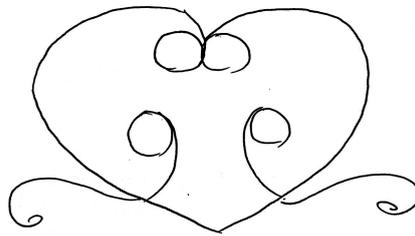
6. Are there democratic processes or mechanisms of community empowerment and action in place that enable the confrontation of these power imbalances?

Raising awareness: Building a consensus that these issues matter among government and large institutions has been a decade-long project for the Māori data sovereignty movement. However, the government now acknowledges that Māori data sovereignty is a legitimate movement and is allocating resources to better understand how to better share power with Māori in this area.

Trust the work: Māori communities are used to relying on each other while working to do great things. We all have responsibilities to each other, and our mana grows as we maintain good standing in our communities. There is an inbuilt democracy in the community when it is allowed to grow. The goal is building healthy communities rather than flash technology.

He manawa whenua, e kore e mimiti

Indigenous Centred Knowledge Unlimited Potential



***Kia tau ngā manaakitanga a te mea ngaro
ki runga ki tēnā, ki tēnā o tātou
Kia mahea te hua mākihikihi***

Let the strength and life force of our ancestors
Be with each and every one of us
Freeing our path from obstruction

***kia toi te kupu, toi te mana, toi te aroha, toi te Reo Māori
kia tūturu, ka whakamaua kia tīna!***

So that our words, spiritual power, love, and language are upheld;
Permanently fixed, established and understood!

Tīna! Hui e, Tāiki e!

Forward together, in affirmation!

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