



Protecting the heartwood

How tikanga Māori and mātauranga Māori can inform the construction of digital identities in Aotearoa New Zealand

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Preface

This title refers to the whakataukī: *‘He rākau tawhito, e mau ana te taitea i waho rā, e tū te kohiwi’*. Which can be translated as *‘an ancient tree with sapwood clinging to the outside and only the heartwood standing firm.’*¹

In one sense, this whakataukī is used to describe a kaumatua whose body may be frail but whose knowledge, experience and guidance is strong. Kaumatua are the holders of mātauranga, tikanga, whakapapa, language and therefore, the holders of our iwi, hapū and Māori identities. In this report, the ‘heartwood’ we are trying to protect that which our kaumatua hold, our identities, tikanga and mātauranga, while the sapwood shifts from the physical to the digital realm.

It reminds us not to forget the treasures of our elders, or our ways, while things change.

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Ko wai au e mihi ana? Ko Mauao raua ko Maungatautari oku maunga. Ko Te Awanui raua ko Kaawhio oku moana. Ko Omanawa raua ko Waikato oku awa. Ko Ngāti Ranginui me Ngāti Raukawa oku iwi. Ko Takitimu raua ko Tainui oku waka. Ko Lucas tōku whānau. Ko Dani ahau. Ki te taha o tōku māmā nō Ingarangi ōku tipuna.

As an indigenous scholar I find it important to acknowledge who I am, as it may influence how I work. I am a Māori researcher that has undertaken this secondary research with Te Kotahi Research Institute to explore how tikanga Māori and mātauranga Māori inform the construction of digital identities and relational responsibilities to data in Aotearoa New Zealand. As part of the ‘Tikanga in Technology: Indigenous Approaches to Data Ecosystems’ project, this report has been greatly influenced by the previous work of this team and their contributions to data sovereignty. The report seeks to better understand

¹ Discussed in Edwards, W. J. W. (2010). *Taupaenui: Māori Positive Ageing* [A thesis presented in fulfilment of the requirements for the degree of Doctor in Philosophy in Public Health]. <https://mro.massey.ac.nz/server/api/core/bitstreams/6b515519-5c99-40ab-8e24-de80250cb1ab/content>, page 125.



how to create a digital landscape that better reflects the indigenous community of Aotearoa New Zealand.

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Executive summary

This report analyses seven existing frameworks to identify how tikanga Māori and mātauranga Māori can inform the construction of digital identities in Aotearoa New Zealand. From the above frameworks, it is possible to see emerging common principles that have been applied to different aspects of the digital landscape including, whakapapa, kaitiakitanga, manaakitanga, kotahitanga and rangatiratanga.

Whakapapa shows us that there is a relational and communal aspect to all data that underpins digital identities, and that Māori digital identities may expand to include the non-human such as mountains, rivers and marae. Whakapapa could both be a tool for identification in the digital space and a reminder of our connection to other digital identities as through whakapapa Māori are connected to the digital identities of tangata and taonga Māori. Whakapapa shows us that these connections are communal creating obligations for individual and groups.

Kaitiakitanga in digital identification reminds us of our obligations to safeguard the digital identities of tangata and taonga Māori, including preserving certain tikanga conditions. Information shared during the construction of digital identification may also be subject to these obligations, and Māori communities should consider what kind of information they are sharing in this process. At the same time, digital identities may provide a way for people to perform their kaitiaki obligation by providing secure access to digital taonga.

Manaakitanga implores us to use digital identification as a way to empower, uplift and respect people, place and taonga. This can be done by ensuring that only necessary information is collected with free, prior and informed consent and by caring for all information that is shared in the construction of a digital identity.

Kotahitanga is about collective benefit and working together. It encourages us to think of inclusive criteria and share the benefit of any data collected when constructing digital identities. It also highlights the importance of interoperability across hapū, iwi and indigenous peoples to allow connection and collaboration.

While rangatiratanga call for Māori communities to provide their own digital identification services that incorporate tikanga and mātauranga Māori.

Contents

Preface	2
Executive summary	4
Contents	5
1. Introduction	6
2. Understanding Digital Identity and Digital Identification	8
2.1. Distinguishing Digital Identity and Digital Identification	9
2.2. Digital Identity.....	10
2.3. Digital Identification	12
<i>Figure 2: Diverse Identity models demonstrating the flow of information from Service User to Service Provider, with the information holder shown.</i>	<i>15</i>
3. Current frameworks that incorporate tikanga Māori and mātauranga Māori in the digital landscape	16
4. Beginning to apply tikanga and mātauranga Māori to digital identities	22
4.1. The importance of whakapapa and whanaunga in digital identification	22
4.2. Maintaining kaitiaki obligations over digital identities.....	26
4.3. Ensuring appropriate manaakitanga is given to digital identities	29
4.4. The importance of kotahitanga in the construction of Digital Identities.....	31
4.5. Rangatiratanga over Māori identities.....	32
5. Conclusion	33
References	35

1. Introduction

“Like an organism, identity evolves, it is in a constant state of flux, and as it comes into contact with another element its form is changed. Māori identity is no different.”²

When the ancestors of Māori left *Hawaiki* (ancient homeland)³, they came into contact with new territory and navigated new oceans. Once arriving in Aotearoa New Zealand, Māori adapted to and learnt from the *whenua* (land). Looking to the *manu* (birds), *maunga* (mountains) and *rakau* (trees), the people changed their ways to reflect their new homeland. The environment became infused in the culture and language, creating unique *mātauranga* (knowledge, wisdom, understanding) and *tikanga* (custom or correct procedure), giving birth to a unique body of knowledge, way of being and, identity.⁴

In the 1800s, once again these ancestors adapted, and their identity shifted. With the arrival of whalers, missionaries and settlers, hapū (kinship groups) needed a communal word to distinguish themselves from these new arrivals. They chose the word for normal or natural - Māori. With the signing of the Tiriti o Waitangi (The Treaty of Waitangi), whakapapa being tied to ‘blocks’ of land and the creation of the Māori Land Courts, Māori identified and re-identify themselves as new systems challenged their way of being. *“From the earliest post-colonial times Māori communities set about adapting societal structures to deal with the new experiences they were encountering. Such examples are the Māori parliaments, the Kīngitanga of the Waikato and the pan Māori movements such as the Kotahitanga.”⁵* Once again, these changes shifted Māori identity nationally and politically.

Currently, there are many forms of Māori identity and many ways to identify as a Māori person. As articulated by Rata (2012) there are *“...diverse experiences of Māori in the 21st century, people of Māori descent may differ in their desired identity position. They may hold different views over what constitutes an ‘ideal’ Māori identity, and they may prioritise other*

² Mahuta, D. (2012). Māori in video games - A digital identity. Te Kaharoa, 5(1). <https://doi.org/10.24135/tekaharoa.v5i1.101>, page 126.

³ All translations of Māori words come from Te Aka online Māori dictionary: Moorfield, J. C. (2024). *Māori Dictionary*. Maoridictionary.co.nz; Te Aka Māori Dictionary. <https://maoridictionary.co.nz>.

⁴ For example, the whakataukī ‘ki te kitahi te kākoho ka whati, ki te kāpuia e kore e whati’ which translates as ‘if a reed stands alone, it can be broken, if it is in a group it can not.’ ⁴ This important lesson, taken from observing the environment in Aotearoa, which advises Māori to work together and seek consensus. Taking this lesson from the kākoho, Māori developed an ability and preference to work together. This and many other lessons from the unique environment transformed our ancestors’ identities. Translation from: Mead, H., & Grove, N. (2003). *Ngā pēpeha a ngā tīpuna*. Victoria University Press.

⁵ Belgrave, M. Māori Customary Law: from Extinguishment to Enduring Recognition (unpublished paper for the Law Commission, Massey University, Albany, 1996), page 10.

*social identities over their Māori identity, such as their iwi identity or hybrid identities.”*⁶

Academics have tried to articulate what impacts Māori identity. For example, the Multidimensional Model of Māori Identity and Cultural Engagement (MMM-ICE) highlights the many factors that influence Māori identity such as age, sole or mixed identity and urban or rural location.⁷

Along with the above dimensions, Māori identities in the 21st Century are influenced by the digital age. From connecting with friends, renewing a passport, or shopping for groceries, more and more of the world’s services, and peoples lives, are moving online. As the world becomes more digital, identities once again shift, this time not from one *whenua* to another, but from a physical environment into a digital one.

With the shift to online services, secure and personalised digital identity is now the basis for many online experiences as individuals, communities, and organisations need to prove who they are in the digital landscape. Digital identities are also quickly becoming necessary for civic participation including, voting (Venezuela)⁸, logging into work (Canada)⁹ or obtaining a driver’s license (Australia).¹⁰ In Aotearoa New Zealand, the Department of Internal Affairs provides RealMe accounts which enable citizens to enrol to vote, open a bank account or renew a passport.¹¹

However, the increase in terms such as *data nullius*¹² and *technocolonialism*¹³ draw attention to the privileging of Western worldviews in the digital expansion.¹⁴ This has

⁶ Rata, A. (2012). *Te Pītau o te Tuakiri: Affirming Māori Identities and Promoting Wellbeing in State Secondary Schools* [In fulfilment of the requirements for the degree of Doctor of Philosophy in Psychology]. <https://core.ac.uk/download/pdf/41337843.pdf>, page 92.

⁷ Houkamau, C., Sibley, C., & Henare, M. (2019). Te rangahau o te tuakiri Māori me ngā waiaro ā-pūtea, The Māori identity and financial attitudes study (mifas) - Background, theoretical orientation and first-wave response rates. *MAI Journal: A New Zealand Journal of Indigenous Scholarship*, 8(2). <https://doi.org/10.20507/maijournal.2019.8.2.4>, page 145.

⁸ Smartmatic. (2004, November 9). *Venezuela: World’s First National e-Voting with Paper Trail Election (2004-2017)*. Smartmatic. <https://www.smartmatic.com/case-studies/venezuela-worlds-first-national-election-using-e-voting-with-paper-trail-2004-2017/>.

⁹ Drost, P. (2024, August 25). *Biometrics in the workplace may be the way of the future. But at what cost?* CBC. <https://www.cbc.ca/radio/costofliving/biometrics-in-workplace-1.7300573>.

¹⁰ Service NSW. (2019, June 14). *New South Wales Government*. [Nsw.gov.au.https://www.service.nsw.gov.au/](https://www.service.nsw.gov.au/).

¹¹ New Zealand Government. (2024). *Proving and protecting your identity*. New Zealand Government. <https://www.govt.nz/browse/passports-citizenship-and-identity/proving-and-protecting-your-identity/>.

¹² Kukutai, T., & Taylor, J. (2016). *Indigenous data sovereignty: toward an agenda*. Australian National University Press. <https://www.jstor.org/stable/j.ctt1q1crgf>.

¹³ Madianou, M. (2024). *Technocolonialism When Technology for Good is Harmful*. Polity. <https://www.wiley.com/en-ie/Technocolonialism%3A+When+Technology+for+Good+is+Harmful-p-9781509559046>.

¹⁴ See Madianou, M. (2024), Kukutai, T., & Taylor, J. (2016), and Munn, L. (2023).

codified practices such as colonialism, individualism and exploitation into the fabric of the digital landscape, once again creating power structures that challenge indigenous ways of being. As digital identity is increasingly used and needed to participate in society, it is essential that Māori are at the forefront of this growth to prevent colonisation in the digital realm.

Therefore, this report asks how can we apply our tikanga and mātauranga or the information, knowledge and wisdom that Māori have collated through the generations to ensure what makes us Māori, our very identities, are able to be expressed in this *ao hou* (new world)?

So, what is digital identity and how is it used today?

2. Understanding Digital Identity and Digital Identification

Identifying yourself has always been a necessary part of society, both to express oneself and to prove who we are to others. As society has developed more complex ways to identify a person or community, answering the question: “who are you?” has also become more complex. For example, to the health system, I may be a National Health Index (NHI) number, to a bank I am Danielle Ta Heke Lucas, to a friend I am Dani and to a whānau member - I am Vincent’s youngest. How one identifies oneself changes depending on who one is talking to or the situation one is in. This is no different in the digital realm where a secure digital identification is required to access services, connect online, and share and receive information. Similar to the above examples, online identification also comes in many forms, one service may need a username and password while another could require a facial scan.

Within these examples two main forms of identity emerge: intrinsic and extrinsic. Our ‘intrinsic identities’ are those which we use when identifying ourselves, for example our political, philosophical, and cultural identities. Intrinsic identities are created by the individual (or group) and expressed or changed by the individual (or group). Our ‘extrinsic identities’, however, are how others (usually organisations) identify us. These diverse identities also exist in the digital space, where you can express who you are (intrinsic identity) for example by posting on Facebook or Instagram. However, there is also the need to confirm who you are, to multiple organisations (extrinsic identity), for example when logging onto Facebook

Although these two forms of identity are often linked, they can be distinct. There are many instances where something on a formal identification document (or an extrinsic identity) may not express or represent how the individual identifies themselves (or an intrinsic identity). For example, legislation in both Aotearoa New Zealand (Aotearoa) and overseas has forced indigenous communities to identify themselves through the lens of Western society. In Canada, the Indian Act deprived Native women (who had married non-status men) Indian status.¹⁵ While blood quantum laws in Aotearoa New Zealand defined someone as Māori only if they had “half or more blood”.¹⁶ Therefore, although your extrinsic identity may say you are one thing you may, intrinsically, identify as another. Although these legislative restrictions on indigeneity have been removed, distinct cultural intrinsic and extrinsic identities remain, for example someone may affiliate with an iwi but not be registered with that iwi (meaning they are not formally recognised by the iwi). The main distinction between these two forms of identity is who dictates what constitutes one’s identity – the individual or a third party. These linked but distinct forms of identity are also present in the digital realm in the form of digital identity and digital identification.

2.1. Distinguishing Digital Identity and Digital Identification

Just like offline, when using a service online, or interacting with someone else on a digital platform, it is the context you are in that decides how you can and should identify yourself. Therefore, in this paper there is a subtle but important distinction between digital identity (intrinsic identity) and digital identification (extrinsic identity). Digital Identity is defined as *“a set of electronically captured and stored attributes and credentials that can uniquely identify a person.”*¹⁷ These attributes include everything from what one posts on social media accounts (including photos comments and interactions with other accounts) to your browsing history (including what websites you visit, what videos you watch and what you click, or don’t click).

¹⁵ Crey, K., & Hanson, E. (2011). Indian Status. Arts. ubc.ca.https://indigenousfoundations.arts.ubc.ca/indian_status/.

¹⁶ Kukutai, T. (2004). The Problem of Defining an Ethnic Group for Public Policy: Who is Mori and Why Does it Matter? - Ministry of Social Development. *Social Policy Journal of New Zealand*, 23. <https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/journals-and-magazines/social-policy-journal/spj23/23problem-of-defining-an-ethnic-group-for-public-policy-who-is-maori-and-why-does-it-matter-p86-108.html#M%C4%81oriACaseStudyforDefininganIndigenousPopulation6>.

¹⁷ Digital Identity New Zealand. (2023). *Digital Identity in Aotearoa: Identity and Trust in an Increasingly Digital New Zealand*. https://digitalidentity.nz/wp-content/uploads/sites/25/2023/02/Digital-Identity-in-Aotearoa-Report_final-1.pdf.

Digital identification, on the other hand, is “*the process of validating a person’s attributes and characteristics, including uniqueness, to establish his or her digital identity.*”¹⁸ In this distinction, identity is what makes you yourself online, while identification is what shows someone else that you are who you say you are. For example, your digital identity is your username in a chatroom, which others use to identify who they are talking to. While your digital identification is the username and password you use to log into the chat room, which the chatroom provider uses to prove who you are, and to control what you have access to. Table 1, below, compares Digital Identity and Digital Identification, to shed light on these differences.

Table 1: Comparing and Contrasting Digital Identity and Digital Identification

Aspect	Digital Identity	Digital Identification
Focus	To express oneself and engage in digital environments	To prove who you are, usually to access/use/provide services or information
Purpose	Create an online persona and self-representation	Verification of identity
Components	Attributes, content, online interactions, behavioural data, digital footprint	Registration, Verification, Issuance and Authentication information.
Parties	Content producer, content consumer, website/platform holder	Service user, identification verifier/holder, service provider
Example	The Facebook profile of a marae	The administrator’s username and password to log into the marae Facebook page

It is important to distinguish between Digital Identity and Digital Identification as each concept uses diverse processes and technologies, which are important to understand when considering how tikanga and mātauranga can inform their construction.

2.2. Digital Identity

Our identities online allow us to express ourselves while connecting with and contributing to our communities. Māori communities have embraced this to share, organise and grow. For example, Marae Facebook pages have become a common way for *uri* (descendants) to stay connected and share information.¹⁹ These pages allow more Māori, living in different

¹⁸ World Bank (2016). Digital Identity: Towards shared principles for public and private sector cooperation (English). World Bank Group. Retrieved from: <https://openknowledge.worldbank.org/bitstream/handle/10986/24920/Digital0identi0e0sector0cooperation.pdf?sequence=1&isAllowed=y>.

¹⁹ Keane, B. (2010, March 11). *Mātauranga hangarau – information technology*. Govt.nz. <https://teara.govt.nz/en/matauranga-hangarau-information-technology/print>.

areas, to connect with their marae. As a central part of one's identity the ability to connect to "...ancestral sites of cultural significance that provide a place to stand and a place to return to"²⁰ has the potential to greatly impact Māori identities in the 21st century.

Alongside Marae Facebook pages that connect uri across the globe, virtual reality or digital twins of marae are now being created. For example, Te Rau Aroha marae in Bluff and Hangarau marae in Tauranga.²¹

Marae are also a key part of communal identity as they belong to the many. When one identifies their marae they are also identifying their connection to place and people. Therefore, having access to these pages online not only influences individual identity, but communal identity. This connection, now possible across distance, has the ability to impact how an individual may feel, and how a marae may function. Further, Marae hold information that belongs to the many. "*Marae are an extension of your identity – not just because, like a username, we use our marae to identify ourselves – but also because, for hau kainga, wharenuī hold these amazing carvings, figures and walls that speak to different things about who they are as people, their tupuna, place, connection and history.*"²²

These digital representations have led to discussions about how tikanga from our marae, are followed and the mātauranga on our marae is protected. Moving marae to the digital space means that traditional ways of restricting access must be managed in novel ways. For example, is a virtual pōwhiri required to access a virtual wharenuī? How could someone conduct an online tangihanga?²³ "*While for a long time for most marae, tikanga has dictated that the online sharing of photos and recordings is prohibited, because Te Rau Aroha is remote and its people are scattered far and wide they have chosen to carve a*

²⁰ Butcher, E., & Breheny, M. (2016). Dependence on place: A source of autonomy in later life for older Māori. *Journal of Aging Studies*, 37, 48–58. <https://doi.org/10.1016/j.jaging.2016.02.004> As outlined in Lincoln, E. M. (2023). Going home: the importance of reconnecting to Māori culture through whakapapa. *Te Tira: A Journal of Māori and Indigenous Leadership*, 1. <https://doi.org/10.26021/15131>, page 3.

²¹ Webb-Liddall, A. (2022, September 27). How cutting-edge virtual reality is making marae more accessible. The Spinoff; The Spinoff. <https://thespinoff.co.nz/atea/28-09-2022/how-cutting-edge-virtual-reality-is-making-marae-more-accessible>.

²² Ibid.

²³ The need for a virtual pōwhiri is discussed on page 38 of : Lloyd-Jones, L., Ott, C., Regenbrecht, H., & Whaanga, H. (2023). *Virtual Reality Pōwhiri - Practicing an indigenous welcoming ceremony*. <https://hci.otago.ac.nz/papers/LloydJonesACMOZCHI2023.pdf>.

The impacts of tangihanga moving online are discussed in: O'Carroll, A. (2013). Kanohi ki te kanohi - a thing of the past? An examination of Māori use of social networking sites and the implications for Māori culture and society [A thesis submitted for the degree of Doctor of Philosophy at Massey University]. <https://communityresearch.org.nz/wp-content/uploads/formidable/8/Thesis-Digital-Ahi-Kaa.pdf>.

*new kawa (principle) and embrace the potential of new technology.*²⁴ These progressions show that as technology is impacted by tikanga, tikanga, too, is impacted by technology.

Marae Facebook pages demonstrate the ability for digital expressions of Māori communal identity to greatly impact our individual identity and how, in turn, that can impact our communal identity (for example how a marae or tikanga may function). It also shows the complexity of managing a digital space which, in the real world, is steeped in both tikanga and mātauranga. How can Māori protect these taonga while providing access to the many?

Such access could be provided by the use of secure and safe digital identification. Therefore, this report mainly focuses on digital identification (opposed to digital identity) for three reasons. Firstly, due to its importance to access services and information, be part of a community and to provide services and information. Secondly, Digital Identification is also usually required to access your digital identity (for example logging into a social media platform), making it a more fundamental concept. Lastly, the *Digital Identity Services Trust Framework Act 2023* means that iwi Māori are now able to become providers of Digital Identification services²⁵, prompting the need to consider how iwi may create a different form of digital identification.

2.3. Digital Identification

The process or construction and use of digital identification is much broader than just the individual or community that is identifying themselves. The digital identity system includes all those who function in the digital identity space including: *“providers of digital identities to customers; businesses that allow the use of digital identities to access their online services; and consumers that use these digital identities.”*²⁶ These three main groups are outlined further below:

- The Service User: These are the individuals, entities or communities that provide credential information in order to access a service, information or to identify themselves. For example, an iwi logging on to Tūhono to access iwi specific data.

²⁴ Webb-Liddall, A. (2022, September 27). How cutting-edge virtual reality is making marae more accessible. The Spinoff; The Spinoff. <https://thespinoff.co.nz/atea/28-09-2022/how-cutting-edge-virtual-reality-is-making-marae-more-accessible>.

²⁵ Digital Identity Services Trust Framework Act, (2023). <https://www.legislation.govt.nz/act/public/2023/0013/latest/whole.html#LMS459587>.

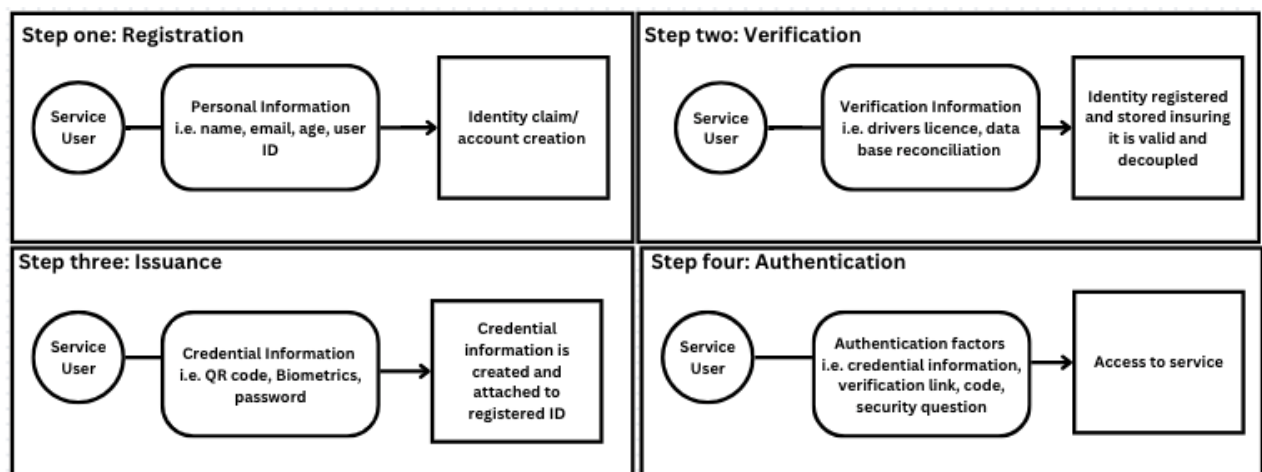
²⁶ Simpson Grierson. (2023, May 17). *New Digital Identity Framework – what does this mean for you?* [www.simpsongrierson.com. https://www.simpsongrierson.com/insights-news/legal-updates/new-digital-identity-framework-what-does-this-mean-for-you](https://www.simpsongrierson.com/insights-news/legal-updates/new-digital-identity-framework-what-does-this-mean-for-you).

- **The Service Provider:** The organisation which provides a service or information and needs to confirm the identity of a Service User before allowing them to access that service. This could be a bank, social media platform, a government, or an iwi. For example, a service provider could be an iwi that provides a ‘members only’ section of their website to allow decedents to access Annual General Meeting minutes.
- **The Identity Verifier:** This organisation verifies, confirms, and stores the Service Users information and provides this information to the Service Provider. In different models of digital identification (discussed on page 14 of this report) the Identity Verifier has a different or even non-existent role. An example of an identity verifier could be a hapū that verifies one’s identity to an iwi organisation.

The construction of Digital Identification

Throughout the construction of digital identification, the Service User shares personal, verification, credential and authentication information with the Service Provider and/or Identity Verifier. It is important to understand what information is shared at each step of this process to assess how tikanga and mātauranga can apply. *Figure 1* below briefly outlines the different information shared by the Service User (presented in the middle of the diagram) for what purpose (presented in the square) in the four different steps of constructing digital identification.

Figure 1: The four steps of constructing a digital identity²⁷



²⁷ As adapted from World Bank Group. (2024). *Identity lifecycle - Identification for Development*. Worldbank.org. <https://id4d.worldbank.org/guide/identity-lifecycle>.

As shown in *Figure 1*, to create a digital identity, the individual, entity, or community must register and create an account. In this process the Service User usually shares personal information such as their name, number, age, and email address, and in doing so, claims an identity. In some situations, the identity claimed may be as innocent as a social media account or as important as a legal identity. What information is shared is dictated by the Service Provider (or Verifier) deciding what they need to validate the identity of an individual or community.

In step two, Validation, the Service Provider ensures that the Service User's information is correct, and the identity is unique (in their system). Identity can be verified through an email verification link, a unique code or, in more formal identification methods, this can be done by showing physical ID, biometric information or cross-referencing ones claimed identity with a separate validated data base. Completing this step means that the Service User has their identity registered and stored with the Service Provider.

In the next step, Issuance, the Service User is issued credential information that is linked to an already existing account. As described by the World Bank (2024), issuance information can be divided into three areas: something you have, are or know.²⁸ Something you have may include a card, a mobile app or a security token. Something you know includes PINs, passwords or security questions and something you are includes biometric information such as face, iris and fingerprint scans. In this step, whatever information is issued is attached to your registered account.

Lastly, in step four, Authentication, information is sent to the Service User to confirm they are who they claim to be. This can be an additional step to providing credential information, such as two-factor authentication or security questions. In each step during the construction of digital identification important and personal information about the Service User is collected.

Models of Digital Identification

Rapidly developing technologies have led to diverse models of digital identification. According to Avellaneda et al (2019) there have been four models of digital identification so far.²⁹ These include:

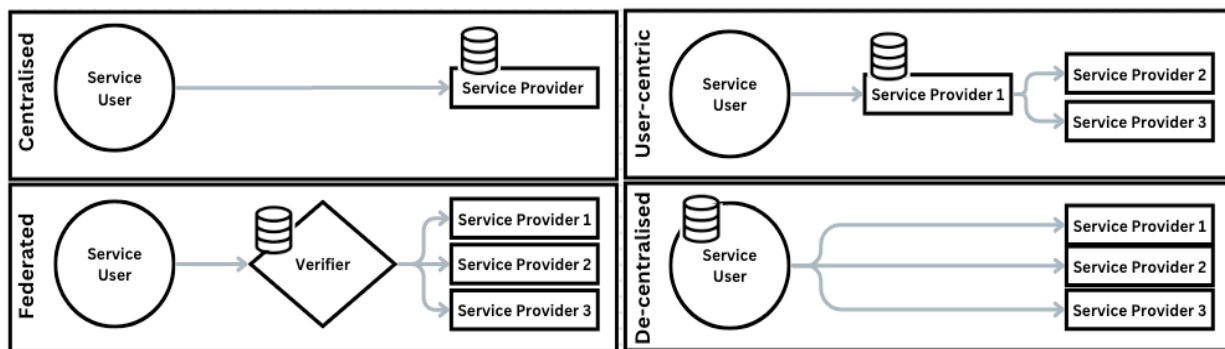
²⁸ World Bank. (2024). *Identity lifecycle - Identification for Development*. Worldbank.org. <https://id4d.worldbank.org/guide/identity-lifecycle>.

²⁹ Avellaneda, O., Bachmann, A., Barbir, A., Brennan, J., Dingle, P., Duffy, K. H., Maler, E., Reed, D., & Sporny, M. (2019). Decentralized Identity: Where Did It Come From and Where Is It Going? *IEEE Communications Standards Magazine*, 3(4), 10–13. <https://doi.org/10.1109/mcomstd.2019.9031542>.

- The Centralised Model (one digital identification for each service i.e. a username and password for an email address),
- The Federated Model (one digital identification that can be used for multiple services i.e. RealMe),
- The User-Centric Model (one digital identification that the consumer already has, that can be used for multiple services i.e. using a Google account to sign into multiple services),
- The Decentralised Model (one digital identification that can be used for all services which is held by the Service User).

Figure 2 below, is a simplified comparison of these different models of digital identification which articulates how information flows between the involved parties: the Service User, Service Provider, and the Verifier. The arrows represent the flow of information, while the data symbol represents who holds the Service User's information.

Figure 2: Diverse Identity models demonstrating the flow of information from Service User to Service Provider, with the information holder shown.



Each of these models gives a different group control over the Service User's information. Control over the data underpinning our digital identities is an important aspect to consider to allow protections for tangata and taonga Māori, while also providing opportunities for Māori to thrive in the digital landscape. With such protections, as with previous blood quantum limits, Western systems of identity will once again be imposed on indigenous communities.

3. Current frameworks that incorporate tikanga Māori and mātauranga Māori in to the digital landscape

Tikanga and mātauranga are unique bodies of knowledge and custom created in Aotearoa New Zealand. Mātauranga is the knowledge or wisdom created through generations of Māori observation and experimentation. 'Mātauranga' derives from the word 'mātau', which is the verb 'to know', encompassing not only what is known but also how it is known and 'ranga' to weave everything together. 'Mātauranga Māori', therefore, refers not only to Māori knowledge, but also to the Māori way of knowing."³⁰

Tikanga is the system of values and practices deeply embedded in Māori society. Tikanga roughly translates to 'protocol', 'custom' or 'procedure' and defines how a person should interact and behave in their daily life. It can be seen as a form of social control and when seen through this lens, "*tikanga Māori controls interpersonal relationships, provides ways for groups to meet and interact, and even determines how individuals identify themselves.*"³¹ How then can tikanga and mātauranga be applied to the digital realm?

Like identity, tikanga is flexible and changes when it encounters something new.³² What is right changes depending on what, where, how, why and who is performing the action. In the StatsNZ *He taonga te raraunga?* discussion a spade was used to demonstrate this point.³³ The participants highlighted how a spade, in an *urupā* (burial ground, cemetery) is tapu due to its proximity to the dead and therefore would not be used close to food. While a spade used in the *māra* (garden) is *noa* (or free of tapu). This example shows how the same thing, given a different context, requires different tikanga. It is not as simple as saying

³⁰ Waitangi Tribunal. (2011). *Ko Aotearoa Tenei: A Report into Claims Concerning New Zealand Law and Policy Affecting Māori Culture and Identity (WAI 262)*.

https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68356416/KoAotearoaTeneiTT2Vol1W.pdf, page 22.

³¹ Lloyd-Jones, L., Ott, C., Regenbrecht, H., & Whaanga, H. (2023). *Virtual Reality Pōwhiri-Practicing an indigenous welcoming ceremony*. <https://hci.otago.ac.nz/papers/LloydJonesACMOZCHI2023.pdf>. Page 2.

³² Moorfield, J. C. (2013). *tikanga*. Maoridictionary.co.nz; Te Aka Māori Dictionary. <https://maoridictionary.co.nz/search?idiom=&phrase=&proverb=&loan=&histLoanWords=&keywords=tikanga>.

³³ Stats NZ. (2018, November 6). *He taonga te raraunga? Is data taonga? - Te reo panel discussion*. YouTube. <https://www.youtube.com/watch?v=P0qXuo9Rwl0>.

a spade is tapu or a spade is noa. This changing of tikanga based on context has also occurred in the digital realm as pōwhiri, tangihanga and marae move online.³⁴

Although tikanga may change, it does so “...with adherence to those fundamental principles and beliefs that Māori considered appropriate to govern the relationships between persons, peoples and the environment.”³⁵ To identify which of these ‘fundamental principles’ should apply to digital identity and digital identification, in this section, this report looks to frameworks that already exist to incorporate tikanga and mātauranga into various aspects of the digital landscape.

Furthermore, as both the process of digital identity and digital identification rely on other areas of the digital landscape, and the data eco-system “displays a heightened or radical interdependence”³⁶ it is important that different aspects of the digital landscape are reformed together, in order to transform the data eco-system.

These frameworks are a range of mechanisms (rules created by actors) and processes (which give practical effect to the mechanisms by adding granularity and specificity which enable the mechanisms to be meaningful in context).³⁷ Each of the frameworks are designed with Māori communities (to varying extents) to help guide Māori and non-Māori practitioners in their use of data, algorithms, and research. The *Data Protection and Use Policy* and *Ngā Tikanga Paihere* were developed by government agencies in conjunction with Māori communities to aid researchers to appropriately use data from the Integrated Data Infrastructure. While the *Five Tests*, *Māori Data Sovereignty Principles*, and *Māori Algorithmic Sovereignty Principles* were created by Māori academics to explore how tikanga can apply to artificial intelligence, algorithms and data. The remaining two frameworks *Vision from the Māori Data Governance Model* and *the Mana Ōrite Relationship Principles* were created in partnership with Māori communities, including the Iwi Chairs Forum. Although there are likely to be more relevant frameworks, these seven

³⁴ See: The need for a virtual pōwhiri is discussed on page 38 of : Lloyd-Jones, L., Ott, C., Regenbrecht, H., & Whaanga, H. (2023). *Virtual Reality Pōwhiri- Practicing an indigenous welcoming ceremony*. <https://hci.otago.ac.nz/papers/LloydJonesACMOZCHI2023.pdf>.

The impacts of tangihanga moving online are discussed in: O’Carroll, A. (2013). *Kanohi ki te kanohi - a thing of the past? An examination of Māori use of social networking sites and the implications for Māori culture and society* [A thesis submitted for the degree of Doctor of Philosophy at Massey University]. <https://communityresearch.org.nz/wp-content/uploads/formidable/8/Thesis-Digital-Ahi-Kaa.pdf>.

³⁵ Durie, E.T. Custom Law (unpublished confidential draft paper for the Law Commission, January 1994), page 331.

³⁶ Transforming data ecosystems in Aotearoa New Zealand. A landscaping report undertaken as part of the Tikanga in Technology (TinT) project Kiri West February 2024 <https://doi.org/10.15663/j21.36016>.

³⁷ Ibid.

provide a base for thinking about how these concepts can and should be incorporated into the construction of digital identification in Aotearoa New Zealand.

Below *Table 2* outlines these frameworks and each of the ‘fundamental concepts’ they consider.

Table 2: A comparison of frameworks that incorporate tikanga and mātauranga into technology (in order of year published)

Framework	Content of the framework					
<i>The Principles of Māori Data Sovereignty (MDS)</i> by Te Mana Raraunga (2018)³⁸	Rangatiratanga Authority <u>Control</u> - Māori have an inherent right to exercise control over Māori data and Māori data ecosystems. This right includes, but is not limited to, the creation, collection, access, analysis, interpretation, management, security, dissemination, use and reuse of Māori data. <u>Jurisdiction</u> - Decisions about the physical and virtual storage of Māori data shall enhance control for current and future generations. Whenever possible, Māori data shall be stored in Aotearoa New Zealand. <u>Self-determination</u> - Māori have the right to data that is relevant and empowers sustainable self-determination and effective self-governance.	Kotahitanga Collective benefit <u>Benefit</u> - Data ecosystems shall be designed and function in ways that enable Māori to derive individual and collective benefit. <u>Build capacity</u> - Māori Data Sovereignty requires the development of a Māori workforce to enable the creation, collection, management, security, governance, and application of data. <u>Connect</u> - Connections between Māori and other Indigenous peoples shall be supported to enable the sharing of strategies, resources, and ideas in relation to data, and the attainment of common goals.	Manaakitanga Reciprocity <u>Respect</u> - The collection, use and interpretation of data shall uphold the dignity of Māori communities, groups, and individuals. Data analysis that stigmatises or blames Māori can result in collective and individual harm and should be actively avoided. <u>Consent</u> - Free, prior, and informed consent (FPIC) shall underpin the collection and use of all data from or about Māori. Less defined types of consent shall be balanced by stronger governance arrangements.	Whakapapa Relationships <u>Context</u> - All data has a whakapapa (genealogy). Accurate metadata should, at minimum, provide information about the provenance of the data, the purpose(s) for its collection, the context of its collection, and the parties involved. <u>Data disaggregation</u> - The ability to disaggregate Māori data increases its relevance for Māori communities and iwi. Māori data shall be collected and coded using categories that prioritise Māori needs and aspirations. <u>Future use</u> - Current decision-making over data can have long-term consequences, good and bad, for future generations of Māori. A key goal of Māori data governance should be to protect against future harm.	Whanaungatanga Obligations <u>Balancing right</u> - Individuals' rights (including privacy rights), risks and benefits in relation to data need to be balanced with those of the groups of which they are a part. In some contexts, collective Māori rights will prevail over those of individuals. <u>Accountabilities</u> - Individuals and organisations responsible for the creation, collection, analysis, management, access, security or dissemination of Māori data are accountable to the communities, groups and individuals from whom the data derive.	Kaitiakitanga Guardianship <u>Guardianship</u> - Māori data shall be stored and transferred in such a way that it enables and reinforces the capacity of Māori to exercise kaitiakitanga over Māori data. <u>Ethics</u> - Tikanga, kawa (protocols) and mātauranga (knowledge) shall underpin the protection, access and use of Māori data. <u>Restrictions</u> - Māori shall decide which Māori data shall be controlled (tapu) or open (noa) access.
<i>Mana Ōrite Relationship Principles</i> By Stats NZ and Data Iwi Leadership Group (signed 2019)³⁹	Rangatiratanga – Leadership that focuses on common purpose whilst also respecting the autonomy and independence of the iwi and members of the Data Iwi Leaders Group.	Kotahitanga – a culture of moving together with solidarity towards a common purpose.	Whakawhāiti – Inclusiveness, acknowledging the respective value and roles of the NICF and the individual iwi, hapū and Māori data stakeholders.	Mana Ōrite – Respective views will be heard, considered and afforded equal explanatory power.	Whanaungatanga – strong transparent relationships through respect, integrity, empathy and commitment to Kaupapa.	
<i>Data Protection and Use Policy (DPUP)</i> Social Wellbeing Agency (2019)⁴⁰	Mana Whakahaere Empower people by giving them choice and enabling their access to, and use of, their data and information. Where possible, give people choices and respect the choices they make. Give people easy access to and oversight of their information wherever possible.	He Tangata Focus on improving people's lives — individuals, children, and young people, whānau, iwi and communities. The He Tāngata Principle has a special role. It wraps around DPUP. It reminds us that everything we do with data should be with this question in mind: “How does this contribute toward the wellbeing of the individual or community?”	Manaakitanga Respect and uphold the mana and dignity of the people, whānau, communities or groups who share their data and information. Recognise and incorporate diverse cultural interests, perspectives, and needs.		Mahitahitanga Work as equals to create and share valuable knowledge. Mahitahitanga expresses partnership, collaboration, and cooperation.	Kaitiakitanga Act as a steward in a way people understand and trust. Be a kaitiaki rather than an owner of people's information. Be open and transparent — support people's interest or need to understand. Keep data and information safe and secure and respect its value. If there's a privacy breach, act quickly and openly.

³⁸ Te Mana Raraunga. (2018). Principles of Māori Data Sovereignty Definition of terms “He rei ngā niho, he paraoa ngā kauae” “One must have the right principles for important endeavours.” <https://static1.squarespace.com/static/58e9b10f9de4bb8d1fb5ebbc/t/5bda208b4ae237cd89ee16e9/1541021836126/TMR+Ma%CC%84ori+Data+Sovereignty+Principles+Oct+2018.pdf>

³⁹ StatsNZ. (2020, March 26). *Mana Ōrite Relationship Agreement*. Govt.nz. <https://www.stats.govt.nz/about-us/what-we-do/mana-orite-relationship-agreement/>.

⁴⁰ Digital Government NZ. (2021, December 2). *DPUP Principles in brief*. New Zealand Digital Government; New Zealand Government. <https://www.digital.govt.nz/standards-and-guidance/privacy-security-and-risk/privacy/data-protection-and-use-policy-dpup/read-the-dpup-principles/dpup-principles-in-brief>.

<i>Ngā Tikanga Paihere</i> Stats NZ (2020)⁴¹	Principle 1: Have appropriate expertise, skills and relationships with communities <u>Pūkenga/knowledge</u> and expertise: Researchers demonstrate an awareness of an intention to work with data in culturally appropriate ways. <u>Whakapapa/Community</u> relationships: Researchers establish suitable relationships with communities before undertaking substantive research.	Principle 2: Maintain public confidence and trust to use data <u>Pono/accountability and transparency</u>: Level of accountability to communities of interest - there is community support for the research. <u>Tika/value for all</u>: Research should be part of a body of work that contributes towards better outcomes for Māori and New Zealanders.	Principle 3: Use good data standards and practises <u>Wānanga/organisations</u>: Institutions have established systems, policies and procedures to support culturally appropriate practices when working with data.	Principle 4: Have clear purpose and action <u>Wairua/community good</u>: Community objectives align with research objectives and any potential harm is considered. <u>Mauri/Data transformation and provenance</u>: Researchers show how data transforms its original collection purpose to support research objectives.	Principle 5: Balance benefits and risks <u>Tapu/sensitivity and risk</u>: sensitivities in the use of data are identified including privacy issues for whānau and identifiable groups. <u>Noa/Benefit and opportunity</u>: Data is readily accessible and there is demonstrated awareness of the impact on communities of interest.	Principle 3: Use good data standards and practises - <u>Kaitiaki/ Data stewardship and governance</u>: communities of interest are identified and involved in research decisions as early as possible.
<i>The Five Tests</i> Moko Meads Tikanga test as applied to Artificial Intelligence⁴² by Luke Munn (2023)	Test 5 – Principles Test 5.1 is <u>whanaungatanga</u>. If a person is a relative, then kin are obliged to assist them or support them as needed. This principle can also be extended to non-kin: classmates, workmates, or the larger iwi that one has membership in. Test 5.2 is <u>manaakitanga</u>. The concept here is to rise above personal grievances and politics, acknowledging the mana of others and showing care and hospitality to them. This test might question the purpose of AI-driven technology. Is it divisive, fostering polarization and forms of antagonism along racial, cultural, or gendered lines? Test 5.3 is <u>mana</u>. A new event or technology should not damage the mana of the subject or user, nor damage those who are involved with it.	Test 4 – Precedent Using past examples to establish correct viewpoints i.e. pūrakau, past events and historical knowledge.	Test 3 - Take-utu-ea For Mead (2016, 27), an incorrect action is considered to be a breach (a <i>take</i>) which then requires some kind of responding action (<i>utu</i>) to reach a resolution (<i>ea</i>). Take-utu-ea is fundamentally about restoring balance, about making things right through an exchange of some kind. Lévi-Strauss (1996) describes this as the principle of reciprocity. For this process to be completed there is a need for transparency – to understand who has transgressed, how and what they are doing about it.	Test 2 – Mauri Mauri is “the spark of life, the active component that indicates the person is alive” (Mead 2016, 53). Other definitions echo this concise shorthand, with Te Aka Māori Dictionary defining mauri as the “life principle, life force, vital essence, special nature...the essential quality and vitality of a being or entity.” This suggests a deep connection or even equivalence between mauri and the self. Once a person or other living thing dies, their mauri is lost.	Test 1 Tapu Operationalizing this knowledge might take the form of a database or set of metadata that contains core concepts or conditions regarding what is tapu. In other words, the information ontology of the model (Guarino 1998), which sets out a kind of world-view of objects, relationships, and events, would need to “know” about tapu and what triggers this condition. This foundational knowledge exists outside or beyond the Western canon, and consists not only of insights emerging from oral histories, life experience, and other indigenous knowledge practices. Codifying this knowledge, then, would mean engaging meaningfully with Māori practitioners and experts to develop a socially nuanced yet operationalizable understanding of tapu.	Test 5.4 is <u>noa</u>. A novel paradigm or condition may need to be introduced in an appropriate way to those who use it so that it can become commonplace and no longer controversial. Test 5.5 is <u>tika</u>. When these more targeted principles fail to yield sufficient guidance, then an evaluation may need to fall back to tika: considering “whether something is ethically, culturally, spiritually, and medically right”.
<i>The Principles of Māori Algorithmic Sovereignty (MAS)</i> By Tikanga in Technology (2023)⁴³	Rangatiratanga Authority <u>Control</u> – Māori have the right to control the development, and use of an algorithm*, including (but not limited to) motives, design, choice of inputs, interpretation of outputs, maintenance, management, and deployment. <u>Jurisdiction</u> - Decisions about the physical and virtual storage of the inputs and computational algorithms used, and the outputs generated from the algorithms shall	Kotahitanga Collective Benefits <u>Benefit</u> - Algorithms must be designed in ways that enable Māori to derive both individual and collective benefits, and to minimize harms. <u>Capacity Building</u> – Individuals and institutions developing and using algorithms must include Māori in all parts of the process for meaningful partnership and to build capability for both Māori and non-Māori.	Manaakitanga Reciprocity <u>Respect</u> - The use of algorithms shall uphold the mana (respect) and dignity of Māori individuals and communities. <u>Privacy</u> – Individual and collective privacy must be considered during the processes of data collection, storage, data re-use, and the dissemination of the outputs of the algorithm. <u>Consent</u> – Any Māori community that an algorithm is applied to must	Whakapapa Relationships <u>Transparency</u> – Transparency is required in all aspects of the algorithm, including (but not limited to) who is involved, motivations, inputs, outputs, maintenance, management, and deployment. These should be clear prior to any application to ensure the algorithm is explainable, and outputs are interpretable. <u>Data Lineage</u> – The use of Māori data throughout the algorithm process	Whanaungatanga Obligations <u>Balancing Rights</u> – Individuals’ rights, risks, and benefits in relation to the algorithms need to be balanced with the collectives they may be a part of. <u>Redress</u> – Māori have the right to challenge the output or outcome of an algorithm if applied to them, and mechanisms for redress must be established in the process of algorithm development.	Kaitiakitanga Guardianship <u>Protection</u> - Inputs used in the algorithms and the resulting outputs must be treated in such a way that enables and reinforces the capacity of Māori to exercise protections over all components of the algorithm, including the inputs, outputs, and computational algorithms. <u>Ethics</u> – Tikanga, kawa (protocols) and mātauranga (knowledge) shall underpin the protection, access, and use of the algorithms.

⁴¹ New Zealand Government. (2020, November 23). *Ngā Tikanga Paihere*. Data.govt.nz. <https://data.govt.nz/toolkit/data-ethics/nga-tikanga-paihere/>.

⁴² Munn, L. (2023). The five tests: designing and evaluating AI according to indigenous Māori principles. *AI & SOCIETY*, 39. <https://doi.org/10.1007/s00146-023-01636-x>

⁴³ Tikanga in Technology. (2023). *Principles of Māori Algorithmic Sovereignty*. <https://static1.squarespace.com/static/58e9b10f9de4bb8d1fb5ebbc/t/6572a0aa8323fc667bc79a31/1702011050546/MASov+two-pager.pdf>.

	enhance control for current and future generations. Whenever possible, the inputs and the outputs of the algorithms shall be stored in Aotearoa New Zealand. <u>Self Determination</u> – Māori have the right to participate in the development and use of algorithms in a way that empowers sustainable self-determination and effective self-governance.	<u>Solidarity</u> – Māori must be supported to connect with other Indigenous groups for the purposes of sharing knowledge, ideas, and strategies regarding the development and use of algorithms. Where appropriate, Māori should also be supported to work with other groups that face discrimination from algorithms.	give free, prior, and informed consent, for both the development and use of the system. This includes consents for data, outputs, and elements of the system that Māori control.	should be clear and uphold the principles and sub-principles set out in Māori data sovereignty guidelines. <u>Sustainability</u> – It must be shown that the data and outputs used and generated from algorithms must provide long-term sustainable benefits to Māori, including environmental sustainability.	<u>Accountability</u> – Individuals and institutions that are responsible for the development of the algorithms are accountable to the Māori individuals and communities that the algorithm affects.	<u>Restrictions</u> – Māori shall decide how the inputs and outputs of the algorithm shall be considered tapu (restricted) or noa (accessible).
<i>The Vision from the Māori Data Governance Model</i> Te Mana Raraunga (2023)⁴⁴	Be accountable Data is relational – all data comes from somewhere or someone. With relationships come responsibilities and accountabilities. Agencies and organisations that hold Māori data must be willing to be held to account, and to be answerable for the decisions made and actions taken.	Put iwi-Māori data in iwi-Māori hands Māori data, including iwi and hapū data, should be put in Māori hands in ways that are tika, and that keep both data and people safe. This requires agencies to implement a Māori-created definition of what Māori data is, understand and uphold the relationships that connect Māori data to iwi-Māori rights-holders, resource technologies that enable the transfer of Māori data to Māori, and remove the barriers that prevent Māori from accessing and using their data.	Use data for good Data should support transformative outcomes and should uplift and strengthen our relationships with each other and with our environments. The avoidance of harm is the minimum expectation for data use. Māori data should also contribute to iwi and hapū tino rangatiratanga.	Decolonise data systems Decolonisation requires the cessation of practices that exploit and extract from Indigenous land, life, and knowledges. The decolonisation of data involves dismantling the structures that perpetuate the dispossession of Māori and Māori data, while shifting the locus of control over Māori data back to Māori.	Nurture data as a taonga Data is often described as the world’s most valuable resource – a commodity to be extracted, used and reused. By contrast, Māori data is a taonga tuku iho – an ancestral gift – which requires active protection and careful nurturing for the benefit of individuals and collectives, now and in the future.	

⁴⁴ Kukutai, T., Campbell-Kamariera, K., Mead, A., Mikaere, K., Whitehead, J., Cormack, D., & Moses, C. (2023). *Māori Data Governance Model*. Te Kāhui Raraunga. https://www.kahuiraraunga.io/_files/ugd/b8e45c_803c03ffe532414183afcd8b9ced10dc.pdf, pages 17-18.

4. Beginning to apply tikanga and mātauranga Māori to digital identities

From the above frameworks, it is possible to see emerging common principles that have been applied to different aspects of the digital landscape. These include whakapapa, kaitiakitanga, manaakitanga, kotahitanga and rangatiratanga. Each of these principles are discussed below in general and then in reference to digital identification. Although this has formed the basis to begin assessing digital identification, it is important to remember “*this process results in a position, not the definitive position.*”⁴⁵

4.1. The importance of whakapapa and whanaunga in digital identification

Whakapapa is an essential part of Māori identity which allows Māori to identify themselves and their relationship to others. For example, at the beginning of this report, I identified myself through my pepeha which outlined my whakapapa. It is not uncommon across cultures to identify yourself through lineage. However, unlike Western forms of lineage which weave connections between people, whakapapa weaves connections to a geographical location from *maunga* to *marae*. This places people within interwoven relationships with each other, the environment, and *atua* (Māori gods).⁴⁶ As Rahui-Macconnell (2018) goes on to explain, a “...*pepeha locates me to all of these aspects of my home, as well as my marae of my iwi and hapū.*”⁴⁷

Though described in diverse ways, the relational nature of data is expressed as *whakapapa*, *whanaunga* and *connections* across the above frameworks. In *Ngā Tikanga Paihere*, applied to the use of data in the Integrated Data Infrastructure, the importance of whakapapa is acknowledged in the first principle of appropriate expertise, skills and relationships. In this framework, whakapapa or connections between communities and researchers is seen as an important prerequisite to research. In *the Principles of Māori*

⁴⁵Munn, L. (2023). The five tests: designing and evaluating AI according to indigenous Māori principles. *AI & Society*, 39. <https://doi.org/10.1007/s00146-023-01636-x>.

⁴⁶ Harmsworth & Awatere (2013), as quoted in Rahui-Macconnell, J. (2018). Māori migration: hau kāinga in relation to tuakiri and hauora [A thesis presented in partial fulfillment of the requirements for the degree of Master of Arts (Psych)]. In *mro.massey.ac.nz*. <https://mro.massey.ac.nz/items/5ee91c8d-faa3-4af8-bfb0-bda232df2581>.

⁴⁷ Rahui-Macconnell, J. (2018). Māori migration: hau kāinga in relation to tuakiri and hauora [A thesis presented in partial fulfillment of the requirements for the degree of Master of Arts (Psych)]. In *mro.massey.ac.nz*. <https://mro.massey.ac.nz/items/5ee91c8d-faa3-4af8-bfb0-bda232df2581>, page 17.

Data Sovereignty, whakapapa or relationships is acknowledged as relating to both the data itself and to Māori communities that the data is about. In this framework, Te Mana Raraunga call for appropriate context (in the terms of metadata) to be applied to all data, for data to be disaggregated to be more relevant to Māori communities and for the future use of data and its on-going impacts to be considered in the context of the community the data comes from. In this sense, Te Mana Raraunga uses whakapapa to highlight the responsibilities we have to the present and to the future. In *The Principles of Māori Algorithmic Sovereignty*, whakapapa creates responsibilities for transparency, applying Māori data sovereignty principles and sustainability, including benefits to Māori and the environment. Combined these frameworks highlight how, even in the digital space, it is important to acknowledge one's connection through whakapapa to the community, context, past, future and environment.

The concept of whanaungatanga is also mentioned in four of the frameworks (*The Five Tests*, *Principles of Māori Data Sovereignty*, *The Principles of Māori Algorithmic Sovereignty*, *Mana Ōrite Relationship Principles*). In *The Five Tests*, Munn describes whanaunga as relations being obliged to assist and support each other, extending this to “classmates, workmates, or the larger iwi that one has membership in”. The *Principles of Māori Data Sovereignty* and *The Principles of Māori Algorithmic Sovereignty* both also acknowledge whanaungatanga as creating an obligation for those using Māori data, to balance collective and individual rights and be responsible to the community the data is about. The *Mana Ōrite Relationship Principles* outline whanaungatanga as “strong, transparent relationships through respect, integrity, empathy and commitment to kaupapa.” This relational concept ensures that users of data are aware that all data ties back to a person, place or thing, that has connections to multiple other people, places and things.

When looking to whakapapa in the context of digital identity, several important points become apparent. The first is that whakapapa information is communal. Whakapapa emphasises that the individual can only exist within layers of relationships with others as the “...foundation that connects all Māori to one another and all Māori to their identity, knowledge and heritage.”⁴⁸ Within my whakapapa, or my expression of my identity, is the identity of thousands of others, for example all of those who also descend from Tainui waka and, importantly, all those that *will* descend from Tainui waka. I am not just holding this information for my current community but those communities before and after me.

⁴⁸ Lincoln, E. M. (2023). Going home: the importance of reconnecting to Māori culture through whakapapa. *Te Tira: A Journal of Māori and Indigenous Leadership*, 1. <https://doi.org/10.26021/15131>, page 2.

When we identify ourselves online, we share personal, validation, issuance and authentication information, each of which has the potential to contain aspects of one's whakapapa. It is therefore important to consider what information and individual or community, as a Service User, is sharing in each step of the construction of a digital identity (outlined in Figure 1), and how that may need to be protected and managed for the individual and the community in which that individual is tied to through whakapapa. This is particularly important with certain forms of information.

For example, biometric information has become a common modality in digital identification. Being highly accurate, convenient, and unique, the use of biometrics is increasing with an estimated 600 million devices using biometric authentication in 2021.⁴⁹ *“Biometric recognition uses an individual’s unique physiological and behavioral attributes to identify and authenticate his or her identity.”*⁵⁰ Primary biometric data includes, fingerprints, facial recognition, vascular recognition, iris recognition and DNA profiling and matching which can be used in issuance, authentication and in some cases validation. While ‘soft’ biometrics, which are usually used throughout a session to continuously verify the identity of a user, include voice recognition and behavioural patterns (such as key stroke patterns, mouse behaviour and digital gate).⁵¹ A common example of ‘soft’ biometric information is a bank using voice recognition to continually verify the Service User during the call.

To access services in Aotearoa New Zealand, biometrics are increasingly being used. RealMe, the New Zealand Government’s *“authentication and identity verification service”*⁵² can be verified through facial scans. While, more recently, the Ministry of Social Development introduced Identity Check (a verification service run by the Department of Internal Affairs) allowing clients to verify their identity online through facial recognition technology.⁵³ The use of biometrics is not yet a precursor to service access for public services in Aotearoa New Zealand, but what if it became so?

⁴⁹ World Bank. (2018). *Technology Landscape for Digital Identification*. World Bank License: Creative Commons Attribution 3.0 IGO. <https://documents1.worldbank.org/curated/en/199411519691370495/pdf/Technology-Landscape-for-Digital-Identification.pdf>, page 29.

⁵⁰ Ibid.

⁵¹ Ibid, page 8.

⁵² New Zealand Government. (2024b, July 5). *Use RealMe to prove your identity online*. New Zealand Government. <https://www.govt.nz/browse/passports-citizenship-and-identity/proving-and-protecting-your-identity/use-realme-to-prove-your-identity-online/>.

⁵³ The Ministry of Social Development. (2023). *Online Identity Check service coming soon*. Govt.nz; MSD. <https://www.msd.govt.nz/about-msd-and-our-work/newsroom/2023/online-identity-check.html>.

The use of biometrics to digitally identify people is increasingly being used beyond access to services. In Canada, companies including bars and sawmills, have introduced the use of fingerprint scans for individuals to ‘log in’ at work, causing concern over employees privacy and data rights.⁵⁴ While in India, Michigan State University is conducting a pilot to enroll infants in the national identification system through iris scans.⁵⁵ In Aotearoa New Zealand, Foodstuffs trialled facial recognition technology (FRT) in 25 supermarkets to prevent theft. In a review of the trial *“The Privacy Commissioner said he is particularly concerned about bias and accuracy, noting that global evaluations of even the most accurate FRT software showed false matches are more likely to occur for people of colour, particularly women.”* The Commissioner went on to say *“I am particularly worried about what this means for Māori, Pasifika, Indian, and Asian shoppers especially as the software is not trained on New Zealand’s population...I don’t want to see people incorrectly banned from their local supermarket and falsely accused.”*⁵⁶ Should the increased use of biometrics in identification be of concern to tangata Māori?

Biometric information contains whakapapa information, at a more personal and physical level than other modalities (such as cards or mobile technologies) because it contains aspects of who you are rather than what you know or have. As whakapapa and the connection between people can be determined through biometric information, it is important to treat this information with more care. As Newbold explains *“It is essential to have tikanga and kawa around whakapapa data because it belongs to the collective. Whakapapa connects people to each other, to te taiao, te ao wairua, and across generations. Sometimes it can be sensitive, so it is important that hapū hold their own digital records and have control over how their whakapapa information is managed.”*⁵⁷ In adopting digital identification systems individuals, iwi and hapū need to consider how and when whakapapa information becomes noa.

Secondly, whakapapa creates relational responsibilities that are wider than the community by intimately connecting Māori to place. *“There is a geographical aspect to*

⁵⁴ Drost, P. (2024, August 25). *Biometrics in the workplace may be the way of the future. But at what cost?* CBC. <https://www.cbc.ca/radio/costofliving/biometrics-in-workplace-1.7300573>

⁵⁵ World Bank. (2018). *Technology Landscape for Digital Identification*. World Bank License: Creative Commons Attribution 3.0 IGO. <https://documents1.worldbank.org/curated/en/199411519691370495/pdf/Technology-Landscape-for-Digital-Identification.pdf>, pages 30-31.

⁵⁶ 1 News. (2024, February 8). *Foodstuffs’ facial recognition tech trial concerns Privacy Commissioner*. 1News. <https://www.1news.co.nz/2024/02/08/foodstuffs-facial-recognition-tech-trial-concerns-privacy-commissioner/>.

⁵⁷ Ngā Pae o te Māramatanga. (2024). *Hapū Data Sovereignty*. Maramatanga.ac.nz. <https://www.maramatanga.ac.nz/news-events/our-stories-our-people/hap-data-sovereignty>.

*identity, of belonging and of tūrangawaewae, or the places where one's feet (waewae) are literally woven (ranga) to their standing place (tū)."*⁵⁸ This aspect of whakapapa means that Māori have a relational responsibility to not just other people but te taiao or the environment. Through whakapapa one is not just connected to those that look lovingly at Mauao, but to Mauao itself. If the digital landscape is being developed by cultures that do not recognise such a connection – how can the relational connections between place, or the non-human, and Māori be acknowledged under the current digital constructions? how can we demonstrate these connections in the current digital realm?

Lastly, as Māori communities move to being Service Providers, could whakapapa as a Māori concept of one's identity, be the information required to register, validate and authenticate people? Could we use whakapapa as a way to access iwi/hapū services or information such as signing into a virtual marae or inputting into a long-term iwi plan? Who would verify this information? And how would this information be verified?

The answer to these questions may, once again, be contextual. To access iwi run services, vote in iwi elections or input into iwi forums, verification with an iwi data base could be sufficient. For example, Tainui offers discounts at Mitre 10 for iwi members, these discounts, and others, could easily be made accessible through ones digital identification, relying on the Tainui register as the verification. However, to access government services or provide answers for the national census, verification with a government held data base may be necessary.

Whakapapa shows us that there is a relational and communal aspect to some data that underpins digital identities, and that Māori digital identities may expand to include the non-human such as mountains, rivers and marae. Whakapapa could both be a tool for identification in the digital space and a reminder of our connection to the digital identities of tangata and taonga Māori. Whakapapa also shows us that these connections create obligations for individual and groups– as explained in the next section, kaitiakitanga.

4.2. Maintaining kaitiaki obligations over digital identities

Whakapapa comes with certain responsibilities and obligations. These obligations exist between people, places, plants and animals, creating *kaitiaki* responsibilities. This means

⁵⁸ Jackson, A.-M. (2018). View of Wāhine Māori Reflections on Wai. *Junctures: The Journal of Thematic Dialogue*, 19: Oceans, 18–21. <https://junctures.org/index.php/junctures/article/view/287/539>, page 19.

that within one's identity is also one's responsibility to others, to *te taiao* (the environment) and to the collective.⁵⁹

Five of the frameworks assessed above highlight the importance of considering kaitiakitanga in the digital landscape. In the *Data Protection and Use Policy* kaitiakitanga directs data analysts “to act as stewards in a way that people understand and trust” by realising “that they do not own this information but keep it in trust... for the individual, whānau and wider communities both now and between generations.” In *Ngā Tikanga Paihere*, data analysts are encouraged to “involve the communities of interest in research decisions as early as possible.” In both the *Māori Data Sovereignty* and *Māori Algorithmic Sovereignty* frameworks kaitiakitanga is described as guardianship and reinforces that “tikanga, kawa and mātauranga should underpin the protection, access and use” of both data and algorithms. They also both highlight how data and algorithms need to be treated in “such a way that enables and reinforces the capacity of Māori to exercise protection or kaitiakitanga.” In the *Mana Ōrite Principles* kaitiakitanga is described as “a shared culture of respect, guardianship, care and protection for data as a strategic and valued resource, recognising that for the National Iwi Chairs Forum, Māori data is a taonga and iwi-Māori are kaitiaki over their taonga.” While in the *Māori Data Governance Model*, the “be accountable” value highlights the obligations that come with relational data. Combined, these frameworks show that kaitiaki obligations exist in the digital realm both to tangata and taonga Māori.

However, in the process of colonization, as articulated in WAI 262, Māori have been alienated from the ability to perform kaitiaki obligations over taonga, including:

“...decisions of vital importance to their culture – for example, decisions about the flora, fauna and the wider environment that created Māori culture, and decisions about how education, culture and heritage agencies support the transmission of Māori culture and identity. Iwi and hapū are therefore unable to fulfil their obligations as kaitiaki... towards their taonga – yet these kaitiaki obligations are central to the survival of Māori culture.”⁶⁰

⁵⁹ Waitangi Tribunal. (2011). *Ko Aotearoa Tenei: A Report into Claims Concerning New Zealand Law and Policy Affecting Maori Culture and Identity* (WAI 262).

https://forms.justice.govt.nz/search/Documents/WT/WT_DOC_68356416/KoAotearoaTeneiTT2Vol1W.pdf.

⁶⁰ Waitangi Tribunal. (2011). *Ko Aotearoa Tenei: A Report into Claims Concerning New Zealand Law and Policy Affecting Maori Culture and Identity* (WAI 262).

https://forms.justice.govt.nz/search/Documents/WT/WT_DOC_68356416/KoAotearoaTeneiTT2Vol1W.pdf.

As we move into the digital space, there is a need to protect digital taonga to prevent kaitiaki obligation from being alienated once again.⁶¹

So how can these obligations be maintained in the digital realm? How might someone, in registering their digital identity, acknowledge that the information they are sharing contains kaitiaki obligations? For example, how can I alert my father that I have entered whakapapa data on a website? How could I show that an image I have uploaded, for example from my wharenui, has connections to other members of my marae? How could appropriate behaviour be ensured in the digital realm, particularly with the creation of digital twins of taonga such as marae and waterways?⁶²

Perhaps, metadata (containing conditions and proving context) could be attached to information shared in the process of constructing a digital identity. One method to attach metadata to taonga is Traditional Knowledge (TK) Labels. The labels “allow communities to express local and specific conditions for sharing and engaging in future research and relationships in ways that are consistent with already existing community rules, governance and protocols for using, sharing and circulating knowledge and data.”⁶³ Although currently targeted at research data, these labels have the potential to highlight kaitiaki obligations for communities and individuals across data from digital identification too. Another possible solution, as suggested by Specht et al (2025), is the use of blockchain so that “...data owners will determine the sovereignty and sharing permissions for their data. To ensure ownership is always clear, and subsequent use of data is tracked, we harness blockchain technology alongside smart contracts and decentralized identifiers to allow secure discovery and sharing. The use of blockchain will ensure the information about each dataset (metadata, provenance, and access rights) is immutably connected to each dataset.”⁶⁴ However, enforcement of TK labels and the use of blockchain may be difficult with international digital identification providers.

Alternatively, secure digital identification could appropriately restrict access of taonga to either those with kaitiaki obligations or to those who have consented to appropriate use. In

⁶¹ Kukutai, T. (2024). *How Indigenous communities in New Zealand are protecting their data*. Science, 384(6691). <https://doi.org/10.1126/science.ado9298>.

⁶² For example the Ōtākaro River system as discussed in: The Geospatial Research Institute Toi Hangarau. (2024, September 18). *The Ōtākaro Digital Twin – Geospatial Research Institute Toi Hangarau*. Geospatial.ac.nz. <https://geospatial.ac.nz/the-otakaro-digital-twin/>

⁶³ Local Contexts. (2021). *TK Labels*. Localcontexts.org. <https://localcontexts.org/labels/traditional-knowledge-labels/>.

⁶⁴ Specht, A., Bryceson, K., Cao, S., O'Brien, M., Guru, S.M., Correa, P.P. and Waycott, M. (2025) A Collaborative Data Network for the Asia Oceania Region Enabled by Emerging Technologies to Foster Innovation in a Secure and Open Environment. *Data Science Journal*, 24: 1, pp. 1–15. DOI: <https://doi.org/10.5334/dsj-2025-001>, page 1.

this way, digital identification could enhance the ability for people to exercise kaitiaki obligations, share knowledge and encourage connection.

Looking to other parts of the construction of digital identification, kaitiakitanga can be expressed in a range of different ways. In the registration process, the personal information that is shared by both individuals and communities needs to be protected by those receiving it, acknowledging that the information does not belong to them and that it may, in fact, belong to a collective. This raises an interesting tension between ensuring personal information is protected while also shared with the collective (for example, how can hapū communally use, store and care for digital identity data while also allowing individuals to retract or maintain profiles?).

Kaitiakitanga in digital identification reminds us of our obligations to safeguard data of tangata and taonga Māori, including preserving certain tikanga conditions. Information shared during the construction of digital identification may also be subject to these obligations, and Māori communities should consider what kind of information they are sharing in this process. At the same time, digital identities may provide a way for people to perform their kaitiaki obligation by providing secure access to digital taonga only when certain conditions are met.

4.3. Ensuring appropriate manaakitanga is given to digital identities

Māori communities, through whakapapa connections and kaitiaki obligations, strive to preserve the mana of people, place and taonga. In maintaining someone or something's mana, an individual or community grows their own mana. Breaking down the word, manaakitanga, means to uplift (aki) someone or something's mana (prestige, status). Therefore, as pointed out in the *Five Tests Framework* respecting someone's mana is also ensuring that technology can help one to “...cultivate and actualize their potential.”⁶⁵

Manaakitanga is raised in four of the discussed frameworks. The *Data Protection and Use Policy* describes it as respecting and upholding “the mana and dignity of the people, whānau and communities” who share their data by “showing respect, generosity and care for the people who use services, their whānau and communities. It also means to show respect and care for their information and stories.” The *Five Tests* also acknowledges manaakitanga in test 5.2 as the concept of rising “above personal grievances and politics,

⁶⁵ Munn, L. (2023). The five tests: designing and evaluating AI according to indigenous Māori principles. *AI & SOCIETY*, 39. <https://doi.org/10.1007/s00146-023-01636-x>.

acknowledging the mana of others and showing care and hospitality to them.” This is applied to AI by asking if the technology is inclusive, respecting, and uniting diverse peoples? *The Principles of Māori Data Sovereignty* acknowledge manaakitanga as reciprocity, ensuring that data analysis is done with the free, prior and informed consent of Māori communities and in a way that upholds the dignity of Māori communities. Likewise, manaakitanga is translated as reciprocity in *The Principles of Māori Algorithmic Sovereignty*, and is expressed as upholding dignity for Māori communities, considering collective and individual privacy and having free, prior, and informed consent. Although manaakitanga is not mentioned in the *Mana Ōrite Relationship Principles*, Mana Ōrite is described as “*respective views being heard, considered and afforded equal explanatory power.*”

If to increase mana is to treat someone with respect, how does this extend to someone’s digital identity? Should my post on Facebook get the same respect as myself in person? Should each part of the collection of data that makes up my digital identity get the same respect? And how is that possible when these different elements (i.e. my search history, age and gender) are bundled up as consumer profiles?

Beyond the individual, how can hapū, iwi and community provide manaakitanga to the digital identities of their taonga? As Māori communities become providers of digital identity services, how can they uplift digital identities?

When thinking about the different aspects of digital identification, the first step registration, includes showing respect to the personal information provided by individuals and communities and how that information is collated, protected and used. For example, an iwi organization creating digital identity for uri could ensure they are only collecting the minimal amount of information required by reflecting on the purpose for collecting information. If the purpose of collecting an address is to understand if uri live in the *rohe* (area), perhaps a tick box asking if someone lives in a certain area is more appropriate? Less intrusive forms of data collection would allow iwi to collect the required registration information, while showing respect to people’s privacy.

In validation, applying manaakitanga could make us consider the different ways that an individual or community could choose to identify, how do we show respect to diverse identities that may change over time? How can we ensure we are not enforcing identity norms on others like were once done to us? For example, if someone wishes to use their marae to identify themselves at one point, and their hapū at another? Could there be different levels of one’s digital identity that allow them different permissions to access different information or services? Diverse permissions for distinct identities already exist,

for example, Tūhono provides access to different data depending on who has signed in, an individual or iwi can access information about themselves that others may not be able to.⁶⁶

Manaakitanga implores us to use digital identification as a way to empower, uplift and respect people, place and taonga. This can be done by ensuring that only necessary information is collected with free, prior and informed consent and by caring for all information that is shared in the construction of a digital identity.

4.4. The importance of kotahitanga in the construction of Digital Identities

In both the *Principles of Māori Data Sovereignty* and the *Principles of Māori Algorithmic Sovereignty* kotahitanga is described as ‘collective benefit’, calling for data ecosystems and algorithms which are created in a way that “*enable Māori to derive individual and collective benefit.*” Both frameworks also talk about capacity building and highlight that kotahitanga means making connections with other communities to share “*strategies, resources and ideas.*” Likewise, although not described as kotahitanga, the *Vision from the Māori Data Governance Model* describes data as a way to “*uplift and strengthen our relationships with each other and with our environments...*” In the *Mana Ōrite Relationship Principles*, kotahitanga means “*a culture of moving together with solidarity towards a common purpose.*” Similarly, the *Data Protection and Use Policy* mentions mahitahitanga or working as “*equals to create and share valuable knowledge*” to “*express partnership, collaboration and cooperation.*” It goes on to explain that “*when people are supported and cared for throughout the mahi, this provides and inspires valuable, knowledge and insights that benefit everyone.*”

These frameworks demonstrate that kotahitanga can be about collective or joint benefit in the digital space. In the digital identification process this could include inclusive criteria for the registration process to allow individuals and communities to choose which information they share, with digital identity providers working to allow access rather than harvest information. Is there a way for Māori communities to receive benefit for their digital identities? Could hapū and iwi receive benefit from providing or validating digital identities to the government or for other services?

⁶⁶ Tūhono. (n.d.). *Tūhono Organisation*. Tuhono.net. Retrieved March 12, 2025, from <https://www.tuhono.net/en/about-us/tuhono-organisation>.

Kotahitanga also means working together. In terms of issuance and authentication, kotahitanga could mean creating digital identities that are interoperable across multiple iwi (as many tangata Māori identify with multiple iwi). Furthermore, multiple iwi may have obligations to kaitiaki certain digital representations of taonga – how can interoperable systems allow this? Is there a way to create digital identities that are interoperable across indigenous peoples to allow the sharing of strategies, resources and ideas as mentioned above? To ensure this is possible, Māori individuals, whānau, hapū, iwi and communities need control over their digital identities.

4.5. Rangatiratanga over Māori identities

Another concept covered in the above frameworks is rangatiratanga, conveyed as ownership, control, jurisdiction, and consent. In the digital space, this reflects data sovereignty at an individual and collective level. In the *Principles of Māori Data Sovereignty* rangatiratanga is described as authority and expressed in terms of control over Māori data, its storage and the ability for the data to empower “*sustainable self-determination and effective self-governance*.” In *The Principles of Māori Algorithmic Sovereignty* rangatiratanga is also described as authority and expressed in the same way in relation to algorithms. In the *Mana Ōrite Relationship Principles* rangatiratanga is articulated as leadership that focuses on common purpose whilst respecting the autonomy and independence of iwi and members of the Iwi Leaders Group. The *Vision from the Māori Data Governance Model* acknowledges that “*Māori data should also contribute to iwi and hapū tino rangatiratanga*.” Although the *Data Protection and Use Policy* does not mention rangatiratanga specifically, it does mention mana whakahaere which is described as “*governance, authority, jurisdiction, management, mandate and power*” and is used to express an individual’s right to have control over their data.

However, control over the digital identities of tangata and taonga Māori has (so far) been restricted. As with data, algorithms and artificial intelligence Western values have been infused into these systems, resulting in digital identities that harvest data and restrict definitions of identity. To achieve rangatiratanga in the digital identity space, with no restrictions, iwi Māori could create their own forms of digital identification. Digital wallets are already being used to ensure some taonga, when sold as goods, are accompanied by accurate information, helping to preserve “*the veracity of something when trading it and to protect intellectual property*”.⁶⁷ How could this apply to tangata Māori? Can iwi provide

⁶⁷ Sustainable Business Network, Thinkstep ANZ, & Aurecon. (2024). *Enabling digital technologies for New Zealand’s circular and bioeconomy, including the role of digital twins*.
<https://www.mbie.govt.nz/dmsdocument/28289-digital-technologies-digital-twins-and-the-circular-and>

digital passports that allow uri to connect, access services and share information? What could such a system look like?

Looking to the questions raised so far in this analysis, iwi passports could use whakapapa as a central part of identification relying on kaumatua knowledge and iwi registers. For verification. In the collection, storage and use of any data underpinning ones digital identification, iwi could show manaakitanga by only asking for necessary information, respecting the information that is shared and ensuring that full consent is gain before any information is taken. In line with kotahitanga, iwi passports could be interoperable with other iwi services, would provide access to benefits for users and could be an avenue for users to input into iwi plans, building connections and collaboration. To uphold kaitiakitanga, iwi passports could be used to share upcoming events, access digital twins of taonga and notify people of rāhui or restrictions in place. Iwi could live update services and information that is available to uri, connecting the diaspora and returning urban Māori to their marae, in the digital space.

Tino rangatiratanga in the digital identity space could be an iwi Māori providing their own digital identification services that incorporate tikanga and mātauranga Māori.

This section shows that there are many concepts from tikanga Māori and mātauranga Māori that have been used to guide behaviour in the digital landscape. From the above analysis it is clear that these concepts should and can be used to guide our behaviour in the construction of digital identities. However, how they apply to the specific steps of the construction of digital identification, the different models and the different modalities (including the technology that underpins them) needs to be further explored. There are also many parts of mātauranga and tikanga that this report has not explored including looking to pūrākau or the significance of *wai* (water) in one's identity. Furthermore, as raised by Munn (2024), any incorporation of tikanga *“needs to be accompanied by a slower reflection on the nature of power and one's role within it.”*⁶⁸

5. Conclusion

The need for digital identification is growing and will continue to grow as the digital landscape expands. As a way to connect to others, access services and share information, it is an important tool for Māori communities. Further as Māori communities move to provide services and share information through digital identities it becomes increasingly

-bioeconomy.

⁶⁸Munn, L. (2023). The five tests: designing and evaluating AI according to indigenous Māori principles. *AI & SOCIETY*, 39. <https://doi.org/10.1007/s00146-023-01636-x>.

important to explore how this can be done in a way consistent with tikanga and mātauranga.

By looking to already existing frameworks that incorporate concepts from tikanga and mātauranga into the digital landscape, it is possible to highlight aspect that may also apply to digital identity and identification. Underpinned by the importance of whakapapa to our identities, tikanga means that there are obligation to care for (tiaki) the digital representations of our human and non-human relatives (whanaunga), ensuring the information that underpins these are respected (manaaki) and used for the benefit of all (kotahitanga). To do so, Māori communities must play a pivotal role in the creating, holding, sharing, storing and transferring of digital identities (rangatiratanga) in the registration, verification, issuance, and authentication.

Although there are many warnings on how technology can be used against Māori and it is true that we must be vigilant, there is also hope in how it can be used to enhance Māori communities. We can use technology to amplify tikanga and protect our mātauranga. We can use the tools of the Pākehā, no longer to just sustain our body but to sustain our tikanga, mātauranga, and our identities – so that we protect the heartwood.

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