Journal of the Royal Society of New Zealand

RESEARCH ARTICLE OPEN ACCESS

"If It Don't Talk, It's Not Whakapapa Data": Conceptualising Whakapapa Data in a Digital Age

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Received: 2 September 2025 | **Revised:** 5 December 2025 | **Accepted:** 6 January 2026

Keywords: data protection | data sovereignty | digital context | Māori | taonga | tikanga | whakapapa

ABSTRACT

In Te Ao Māori, whakapapa is a sacred framework that connects all aspects of existence. Whakapapa is highly sensitive information and a taonga that requires active protection. But what can be considered whakapapa data in a digital age where data linkage is ubiquitous and the boundaries between personal and collective information are increasingly blurred? We explore this question through a case study with Ngāti Tiipa, a hapū that is actively engaged in its own data sovereignty research. Reflexive thematic analysis of whānau kōrero identified three types of whakapapa data, each denoting a specific kind of connection: 1) between relatives, both living and deceased; 2) between people and places of cultural significance; and 3) between people and the spiritual realm. Whānau concepts of whakapapa data tend to be context-specific, suggesting that it is more useful to think of whakapapa data as dynamic and relational rather than a fixed, inherent attribute.

1 | Introduction

Indigenous data sovereignty (IDSov) scholarship has rapidly expanded in the last decade, generating diverse strands of research that engage with law (Tsosie 2020), governance (Carroll et al. 2020; Lovett et al. 2019), policy (Walter et al. 2020), ethics (Marley 2019), technology (Bowen and Hinze 2022; Mackey et al. 2022), and community-led practice (Carroll et al. 2022; Jones et al. 2025). At its heart, IDSov affirms that Indigenous Peoples hold inherent sovereignty over their data. This data is not merely informational—it is a taonga (treasure), carrying cultural, spiritual, and political significance (Kukutai et al. 2023). Yet exercising sovereignty over data is increasingly challenging. Contemporary technologies, with their capacity for rapid adoption, linkage, integration, and commodification, intensify risks of data colonialism (Couldry and Mejias 2019) and raise urgent questions about how Indigenous data can best be protected.

One strategic response to safeguarding Indigenous data is to focus on what is most precious. In Te Ao Māori (the Māori world), whakapapa (genealogy) is a sacred framework connecting people, lands, waters, and all forms of existence (Mahuika 2019). Thus, whakapapa information is a taonga with the highest sensitivity, demanding culturally grounded models of stewardship (Law Commission 2020). However, what can be considered whakapapa data in a digital age where data linkage is ubiquitous and the boundaries between personal and collective information are increasingly blurred? Certain forms of information, such as genealogical and human DNA, are clearly whakapapa data, as they carry explicit information about kin relations (Watts and Kukutai 2025). Other forms of data, however, may reveal whakapapa relationships, depending on the context, the capacity to link different kinds of information, and the knowledge of those accessing and using them. Conceptual clarity is important here. Protecting our digital taonga requires a robust understanding of what that taonga is.

In this paper, we examine whānau concepts of whakapapa data through a case study with Ngāti Tiipa, a Waikato hapū engaged in its own data sovereignty research. Using a wānanga methodology, we explore a range of scenarios and digital data sources to

understand what counts as whakapapa data, based on whānau knowledge, perspective and lived experience. Our decision to privilege whānau and hapū is both conceptual and strategic, recognizing both the relational nature of whakapapa data, and the need to develop and support whānau-based data sovereignty approaches and solutions.

1.1 | The Significance of Whakapapa

For Indigenous Peoples, genealogy forms the foundation of collective identities and extends beyond human lineage to include connections with non-human relations including skies, lands, waters, flora and fauna. In Aotearoa, whakapapa is the genealogical sequence that connects Māori to each other, their environments, and the spirit realm (Ngata 2019; Te Rito 2007). Mahuika (2019) explains drawing on White (1890), three genealogical divisions between Popoa-rengarenga (Gods), Takiura (ancestors descended from the gods), and Tua-tangata (humankind). Others describe this existence in terms of Te Kore (the void), Te Pō (darkness), and Te Ao Mārama (light and reality) (see, for example, Walker 1981). These cosmological traditions establish whakapapa as a sacred framework that connects all aspects of existence and underpins Māori worldviews (Connor 2019; Mahuika and Mahuika 2020; Marsden 1981).

Whakapapa is also an organizing framework for the physical world, making explicit the living kinship of all beings including flora, fauna, and landscapes. (Harmsworth and Awatere 2013; Roberts 2013). While maunga and awa might be viewed in "Western" terms as geographic features, in Te Ao Māori they are living ancestors with their own mauri (life force)[1] (Mark et al. 2022). Pepeha[2], a quintessential Māori form of self-introduction, begins with the recitation of maunga and awa which locates people within their ancestral places and communities. Connections with flora and fauna further connect people to the living environment through a shared descent from Ranginui (sky father) and Papatūānuku (earth mother) (Forster 2019; Wilkinson et al. 2020). Whakapapa therefore functions as both a classification system and a map of ecosystem connections, forming an intricate network where all entities—animate and inanimate—possess unique genealogies connecting them to atua, their progeny and people (Cheung 2008; Forster 2019; Roberts 2013). Doing so establishes a relational framework of connection, responsibility, and accountability (Burgess and Painting 2020). Tikanga and kawa—Māori protocols and tribal customs—traditionally protected the integrity and intergenerational transmission of whakapapa (Mahuika 2019) and remain important in contemporary contexts (Quince and Houghton 2023; Watts and Kukutai 2025).

The human kinship dimension of whakapapa has been widely documented, from the waka traditions of voyaging tupuna (Ministry of Justice 2001; Taani 2022) and tribal histories (Halbert 1999; Hammond 1924; P. T. H. Jones and Biggs 2004; Mitira 1990; Stafford 1991) to the deeds of eponymous ancestors (Mahuika 2019) and more intimate whānau genealogies. Whakapapa connects individuals to their ancestors across generations within their whānau, hapū, and iwi (Burgess and Painting 2020). Ancestral narratives provide the foundation upon which collective identities are constructed, highlighting the role of whakapapa in maintaining cultural continuity (Smith 2000; Webber and O'Connor 2019). In whakapapa, past, present, and future generations co-exist as a "genealogical layering that navigates through linear descent-time and lateral kinship-space" (Kawharu 2000, p. 349). Burgess and Painting (2020) describe this as "onamata, anamata," simultaneously seeing the world through the eyes of tupuna who have passed, and through mokopuna yet to come.

1.2 | Whakapapa in an Evolving Digital Context

Emerging technologies and the proliferation of big data have led to diverse representations of whakapapa information and how it is circulated. Whakapapa data are now fragmented and distributed across multiple spaces, including public repositories, government archives, social media platforms, and genetic and genealogical databases (Kukutai et al. 2023), often without appropriate validation processes (Shep et al. 2021). This transformation has greatly expanded the ways in which whakapapa are recorded, stored, and shared, raising concerns about access, control, and protection (Law Commission 2020; Quince and Houghton 2023; Watts and Kukutai 2025). The use of data linkage technologies and methods can also identify familial relationships and (re)constitute kin groups using administrative and other forms of data (Ekbom 2011; Greaves et al. 2023). As technologies transform the ways in which genealogical information is generated, accessed and shared, Indigenous communities continue to seek ways to protect their information while continuing to benefit from it (Kukutai and Black 2024; Tsosie 2020).

Historically, tikanga and kawa governed how whakapapa was collectively shared and transmitted, however, digital technologies have disrupted these practices. Take, for example, ancestry information. In the past, if individuals or whānau were seeking information about their whakapapa they would likely visit a kaitiaki, a guardian entrusted with preserving genealogical knowledge on behalf of the whānau, often recorded in a whakapapa book (Mahuika 2019). Today the development of genealogy websites like Ancestry and MyHeritage provide alternative ways to share and access whakapapa information and historical records and reconstruct family trees. Direct-to-consumer DNA testing further enables individuals to search and connect with relatives through sharing highly sensitive genetic information on commercial websites (Hudson et al. 2007; Taylor et al. 2017). These developments represent a fundamental shift from traditional knowledge governance to individualized data ownership, creating tensions between personal exploration and collective rights.

There are also data protection and privacy risks with sharing whakapapa online, perhaps most evident in the use of DNA for law enforcement purposes (Greytak et al. 2018; Guerrini et al. 2018; Law Commission 2020). Māori concerns about the unconsented and/or unethical use of DNA data for criminal investigations are well documented (Law Commission 2020; Quince 2016; Quince and Houghton 2023; Te Mana Raraunga 2019; Watts and Kukutai 2025). A relatively new tool used by agencies, Forensic Investigative Genetic Genealogy (FIGG), combines DNA analysis with traditional genealogy research to identify suspects in unsolved violent crimes. Law enforcement agencies upload DNA profiles to genetic databases (e.g., GEDmatch PRO) to find possible matches then incorporate

other genealogical information to identify suspects (Gomes et al. 2021; Kling et al. 2021). In the case of the notorious Golden State Killer Joseph DeAngelo, law enforcement in the United States used FIGG to identify individuals who were the equivalent of his third cousins, then turned to traditional genealogical methods to narrow their search to DeAngelo. In Aotearoa, the NZ Police and the Institute of Environmental Science and Research initiated a trial of FIGG for "cold cases" in 2023 (Watts and Kukutai 2025).

The digitization of non-human genomic data has also raised concerns about extractive and unethical practices such as bioprospecting (Coltman et al. 2025; Mc Cartney et al. 2022). In Aotearoa, the "WAI 262" report identified concerns about the commercial exploitation of taonga species—Indigenous flora and fauna of cultural significance to Māori—and the associated mātauranga (Waitangi Tribunal 2011). Bioprospecting exemplifies these concerns as the practice of examining biological resources for commercial value (Ministry of Economic Development 2002; Te Puni Kōkiri 2023) and can lead to the commercial exploitation of Indigenous taonga species and mātauranga without consent. The genomic data of taonga species has whakapapa, connecting people to species, places, events, and atua (Collier-Robinson et al. 2019; Evans 2012). Yet research data repositories rarely acknowledge these cultural relationships of non-human genomic data to Indigenous peoples or implement standards that respect those relationships (Kukutai and Black 2024). This lack of recognition perpetuates of research biases, historical inequities and the erasure of Indigenous knowledges, relationships, and research interests (Hudson et al. 2020; Kukutai and Black 2024).

Collectively, these examples all illustrate Māori concerns about the protection of whakapapa data, as a taonga. However, it is not always clearcut what constitutes whakapapa data in a digital environment where vast amounts of data can be linked and repurposed, and the boundaries between personal and collective data are increasingly blurred. To explore this question "what is whakapapa data?", we undertook a case study with Ngāti Tiipa, a hapū actively engaged in its own data sovereignty research.

2 | Methodology and Data Collection Methods

Ngāti Tiipa is one of the 33 hapū and iwi of the Waikato-Tainui confederation, located in Te Pūaha o Waikato, a region extending from Port Waikato down the Waikato River to Onepoto, opposite Tuakau (Kukutai et al. 2022). This study utilized Kaupapa Māori research methodologies, which prioritized Māori perspectives and knowledge and ensured that research benefits the community to which it pertains (Smith 2012). In defining what constitutes whakapapa data in a digital environment, we prioritized the collective knowledge and lived experiences of Ngāti Tiipa as the kaitiaki of their taonga, including digital taonga (Kukutai et al. 2020, 2022).

Ethical approval was obtained from the Human Research Ethics Committee of the University of Waikato (Reference No: FS2023-21). Community consent was obtained at a marae committee meeting of Te Kumi pā (Te Kotahitanga marae), the main Ngāti Tiipa marae. Individual consent was obtained from 23 Ngāti Tiipa whānau, including rūruhi and koroheke (elderly women and men, aged 60s–80s) and rangatahi (younger whānau members, aged 18–35) who shared kōrero in two wānanga. The lead author, a Ngāti Tiipa uri (descendant), facilitated the wānanga at Te Kumi Pā in November and December 2024. This approach ensured sensitive information, such as whakapapa, was entrusted to those within the collective who have appropriate relationships, knowledge, and intent.

Wānanga are gatherings that use tikanga and kawa to construct and validate knowledge through kōrero and whānau verification processes, creating culturally appropriate spaces for knowledge-sharing (Mahuika and Mahuika 2020; Smith 2016). Two wānanga were structured around scenarios to prompt discussion on what constitutes whakapapa data in a digital context. Screenshots of digital sources about Ngāti Tiipa were used alongside one discussion-based scenario. The scenarios explored across the two wānanga are outlined in Table 1.

In wānanga one, whānau identified aspects of scenario one that could be considered whakapapa data and described their reasoning. In wānanga two, whānau explored scenarios 2–6 and identified whakapapa data using themes from wānanga one. Data collected included group worksheets, recorded kōrero,

TABLE 1 | Description of scenarios and sources used in whānau wānanga.

Wānanga	Scenario	Digital source/type
1	1. Reconnection through archived records: Evaluating witness excerpts and investigative findings about whānau tūpuna discovered during archival research	Coronial inquiry from Archives New Zealand
2	2. Biographical research project: Using historical court records to document tūpuna land rights in the 1800s	Māori Land Court records
2	3. Tribal membership registration: Completing whakapapa verification and identity documentation requirements for Waikato-Tainui membership	Tribal membership database
2	4. Māori Maps platform: Examining public representation of Ngāti Tiipa marae information and cultural content	Māori maps website
2	5. Commercial genealogy platform analysis: Evaluating how commercial genealogy platforms like AncestryDNA present genetic testing options to potential users	Commercial genealogy website
2	6. Discussion of Facial Recognition Technology in Foodstuffs supermarket pilot and implications for the digital capture of moko kauae.	Facial Recognition Technology

whānau-annotated screenshots of digitized materials, and written reflections.

Reflexive thematic analysis (Braun and Clarke 2006, 2019, 2021) was used to identify and interpret patterns of meaning within whānau kōrero. After wānanga one, the lead author transcribed whānau kōrero and immersed themself in the data through repeated reading. They generated initial codes by identifying key phrases that captured meaningful aspects of how whānau understood whakapapa data. Through reviewing these codes, preliminary themes emerged. These were discussed with haukāinga and the co-author, whose insights shaped three core themes. At wānanga two, whānau validated these themes and applied them to code whakapapa data within scenarios 2–6. This process ensured the analysis remained faithful to the collective knowledge and values of Ngāti Tiipa, with the lead author's interpretations informed by ongoing kōrero with whānau.

3 | Results

Through collaborative analysis of the research scenarios and digital sources, three interrelated core themes of whakapapa data emerged, each centered on a particular kind of connection.

3.1 | Theme One: Connections Between People

The first theme of whakapapa data relates to connections between people. For whānau, whakapapa is a living, relational framework that connects past, present, and future generations.

They identified that certain data was inherently whakapapa, such as digitized birth certificates and contemporary and historical data that directly cite whakapapa—for example as required for iwi registration purposes, such as scenario one for tribal membership verification. These sources contain explicit whakapapa information that directly maps familial relationships.

However, making connections to others requires drawing on prior knowledge and kōrero tuku iho. When examining digitized archived records from the mid-20th century in scenario one, whānau highlighted key information such as names, ages, and familial roles such as mother, father, brother, and sister. One pākeke explained how having whānau knowledge enabled them to make sense of the whakapapa information in the records. In this instance, it meant being able to identify sibling relationships:

"It is whakapapa because of the [whānau] surnames … the ages identified that they were siblings."

A rangatahi then connected those relationships to living descendants, asking: "Is that Auntie's sister [a rūruhi in the wānanga] mentioned in this excerpt?" When confirmed, this revealed connections to the rūruhi (now in her late seventies), her father, four siblings referenced in the records, and her two nieces (both in their fifties) who were also present at the wānanga. As one pākeke summarized:

"They [the data] connect others through names of whānau members at that time [to those present at the wānanga]."

This example illustrates how digital information becomes whakapapa data when it identifies and affirms living connections across generations, linking tūpuna from historical records to their present-day descendants.

Whānau also discussed how a supermarket Facial Recognition Technology (FRT) trial in scenario six—where cameras automatically identify facial features—captures digital images of moko kauae without understanding their significance. Three rūruhi discussed the significance of their moko kauae. One rūruhi explained her motivation for receiving moko kauae in terms of generational responsibility:

"The take i moko kauae, nā te mea i te wā i mate ā [Uncle] Hone, ko ia te whakamutunga o tērā reanga, o taua reranga [the reason that I have my moko kauae is that when Uncle Hone died he was the last of that generation] … so I actually wanted to do that for my parents… that whānau you know, the reanga [generation] before me… just to represent them. They all meant a lot to all of us, and that's what it was about."

The same rūruhi shared how her moko kauae is about intergenerational connection:

"Well, it [the moko kauae] really belongs to whānau, but it's an individual that has done it for the whānau… on behalf of the connections of the future and the past… for the next generation."

A pākeke further reinforced how kōrero tuku iho carry these connections forward:

So, that story that Rangi just gave us will … go forward to the next generation, and the next generation. And then, that [generation] will talk about … the kōrero … about Uncle John … Aunty Ti … and Uncle Ching … yeah, all of them.

Based on the reflections our rūruhi shared, whānau were clear that digital images of moko kauae are whakapapa data. They explained that digital images were whakapapa data not simply because of what moko kauae represent, but through kōrero tuku iho—the accompanying narratives that preserve and transmit whānau knowledge and whakapapa within and across generations. As one pākeke noted:

"Because that… narrative goes with the taonga. You can have anything, you can just put a moko kauae on there [pointing to their chin], but if it hasn't got a narrative to it, it's, it's just a tattoo… it's not talking.[3]"

3.2 | Theme Two: Connections Between People and Te Taiao

The second theme of whakapapa data focuses on connections between people and te taiao—the natural world. For whānau, whakapapa connects people to awa, maunga, and whenua that carry ancestral connections that have been maintained through generations. Whānau spoke of connections to the ancestral maunga such as Te Pukeotahinga. Whānau also described how awa are tūpuna. One rangatahi simply put:

Waikato [awa] is… whakapapa to us.

Another pākeke elaborated on this relationship between people and te taiao drawing on her reflection about scenario five, Ancestry DNA results:

Our tūpuna… we're connecting to them through our blood… and then you look at the … the river, we connect to the river… everyone connects there.

The significance of these connections to te taiao align with Ngāti Tiipa oral histories (Kukutai et al. 2020). Rūruhi and koroheke described intimate knowledge of Waikato awa—detailed fishing practices, seasonal tuna patterns, and specific harvesting

locations that ensured self-sufficiency across generations. These oral histories revealed how the awa functioned not merely as a resource but also as a living tūpuna in their lives and identity.

Beyond natural tūpuna such as awa and maunga, whānau identified connections between people and places that carried ancestral connections—land blocks, marae, and papakāinga. As one rūruhi described how digitized Māori land court records in scenario two, reinforced connections to both tūpuna and whenua within tribal areas:

There's a connection through listing of generations, listing of times, placing our people in historical places… It's actually connecting our people in a place of bloodlines.

However, when whānau engaged with the records, they recalled and revealed more than what was documented. For example, rūruhi shared their knowledge of marae, and recalled papakāinga, and the whānau who resided there. Significantly, this information was not even present in the records.

Engaging with these records activated broader knowledge sharing, expanding beyond the documented information to share detailed mātauranga and kōrero tuku iho specific to tūpuna and whenua.

As one rūruhi noted:

Although that is not in the [Māori Land Court records, only], we would know that.

3.3 | Theme Three: Connections Between People and Te Ao Wairua

The third theme of whakapapa data centers on connections between people and te ao wairua—the spiritual realm. Whānau identified how data becomes whakapapa when it links people to cosmological origins, celestial realms, and spiritual interconnectedness.

A particularly powerful example of this whakapapa relationship emerged from discussions between a koroheke and some rangatahi about the digital representations of three Ngāti Tiipa marae—Te Kumi Pā, Tauranganui, and Ngā Tai E Rua in scenario four. In these discussions, a koroheke, a very active member at the marae and within the hapū, sat alongside rangatahi sharing his mātauranga, and lived experience at the marae. Through this intergenerational engagement with the data, the rangatahi came to understand how these data embodied spiritual connections. Reflecting on this experience one rangatahi articulated how the data became meaningful through these interwoven relationships:

I'm saying this altogether because it's all interwoven … So, on reflection, our justification for … [why this is whakapapa data] is that it's all multifaceted and multidisciplinary. It links to [the spiritual realm]:

Within this interconnected understanding, the group talked about the sequence of creation and existence connecting people to cosmological origins. A member of the group noted how the data:

links to Te Kore, Te Whaiao, Te Ao Mārama, [and] Atua.

They went on to then describe the journey of tūpuna from Hawaiki to Ngāti Tiipa and thus their connection to spiritual places of origin and to current place. A rangatahi described that:

tūpuna … are navigating their way through time and place from Hawaiki [creating foundations that allow present day whānau] …unpack the potentialities of the places for the collective well-being and to cement themselves in tūrangawaewae.

Similarly, when rūruhi engaged with historical Māori Land Court records, they shared mātauranga, and kōrero tuku iho, describing their engagement with this data as spanning the celestial realms to the existence of all things, connecting them to:

[ngā] Rangi Tūhāhā nē, mai te atua tae atu ki ngā mea katoa [from the divine realms to God down to all things].

4 | Discussion

Conventional Western genealogical frameworks center on kinship relationships between people, drawing on digitized records such as birth, marriage, and death dates or locations. Through wānanga with Ngāti Tiipa, our findings reveal three types of whakapapa data: connections between people, connections between people and te taiao, and connections between people and te ao wairua. This hapū-derived understanding shows whakapapa is dynamic and relational rather than a set of fixed facts. Our findings show that while some digital information is inherently whakapapa data, other forms of information become whakapapa through whānau lived experience, kōrero tuku iho, and historical events. These insights have significant implications for protecting whakapapa data, in the context of Māori Data Sovereignty.

Birth certificates and whakapapa in Māori Land Court records contain explicit connections to people and therefore remain whakapapa when digitized as they map whānau relationships. Similarly, digital representations of awa and maunga are inherently whakapapa because these are ancestral tūpuna, while information about marae and papakāinga is whakapapa because these places carry ancestral connections to whenua. These findings show that some forms of digital information are whakapapa by their very nature because traditional ways of understanding whakapapa persist in digital environments. This understanding highlights the enduring interconnectedness between individuals, ancestors, and whenua (Mahuika and Kukutai 2021; Mahuika and Mahuika 2020). However, other types of data become whakapapa data only when linked to hapū information, or when used in a relational context that emphasizes reciprocal connections through lived experience, kōrero tuku iho, and historical events.

During our wānanga, we observed how whānau engaged with digital sources not merely as sources of information, but as living taonga. A powerful example came from rūruhi, who spoke of tūpuna from the mid-1800s, connecting historical events to their lived experience and knowledge passed down, reconnecting those ancestors to whenua, papakāinga, and whānau as part of living whakapapa in the present. This reflects the temporal understanding, described by Burgess and Painting (2020), where we understand the past through our tūpuna by knowing our whakapapa, and glimpse the future through our mokopuna. However, this potential carries risks when data is accessed, shared and used outside these contexts, particularly when tikanga and kawa are not upheld.

Digital technologies have simultaneously created opportunities and threats in how people access and engage with whakapapa

data. Whakapapa data now circulates across multiple domains; commodification of genealogical information by commercial platforms; use of genomic data in biomedical research; and deployment in criminal investigations through forensic genealogy databases. Each of these domains raises concerns about ownership, consent, and control. When data circulates without collective oversight, it can be shared without cultural context, undermining whakapapa knowledge integrity. Whakapapa data can facilitate reconnection for whānau disconnected through adoption, enabling them to discover genealogical connections through DNA databases and platforms. Yet, without collective oversight and cultural protocols, these benefits risk being outweighed by extractive uses. This reinforces Indigenous nations' need for control over their data and community-developed systems that resist extractive approaches (Kukutai and Cormack 2019; West et al. 2020). These insights show why protection frameworks must address the collective nature of whakapapa data, which current legal approaches to data protection in Aotearoa fail to address.

Western paradigms of data privacy privilege individual rights over collective relationships. As the Law Commission (2008) noted, New Zealand's legal system fails to address the collective nature of Māori privacy concerns regarding whakapapa data, by focusing on individual entitlements rather than collective rights. The digitization of moko kauae illustrates this concern. FRT creates biometric face templates from facial images to identify matches (Privacy Commissioner 2025). However, this process renders moko kauae invisible as the technology only recognizes facial geometric properties, not moko kauae or mataora. The technology reduces these taonga to geometric data divorced from their whakapapa. As one pakeke explained, "it's not talking"—this process silences the relational dimensions embodied in moko kauae, severing the intergenerational connections. Instead of being recognized as expressions of living whakapapa that embody ancestral knowledge and identity across generations, they become invisible within the technology's logic. Our findings reveal that these taonga hold deep connections to tūpuna that extend beyond the individual. A rūruhi explained, "[my moko kauae] was about … my dad, [his] sisters [and brothers], … the whole lot of them the … we spent so much time with them … [the moko kauae] was to represent [them]." The disconnect between individualistic data frameworks and the collective nature of whakapapa data creates challenges for protecting culturally sensitive information in digital environments, where it can be replicated and shared without permission and appropriate cultural protocols (Shep et al. 2021). Kukutai et al. (2023), argue that addressing these tensions requires a privacy framework centered on Māori values, adopting a holistic approach grounded in tikanga principles.

5 | Conclusion

Our case study with Ngāti Tiipa explores what constitutes whakapapa data in contemporary digital contexts. Rather than existing as static information, whakapapa data emerges through whānau engagement within specific cultural contexts. These findings affirm that whakapapa data is fundamentally dynamic and relational, connecting whānau across time and space. Western data paradigms treat information as detached from spiritual and cultural connections, relying on individualistic privacy models that ignore the collective, spiritual, and relational nature of whakapapa data. Tensions intensify with open data, AI, and commercial platforms. Technologies like facial recognition and machine learning offer benefits but create protection challenges, especially without tikanga and kawa. These challenges exacerbate tensions between individualistic data frameworks and collective Māori data needs. Without appropriate tikanga protections, whakapapa data can be accessed and used without collective oversight, compromising its integrity as living, relational knowledge. Further research should explore how tikanga-based approaches can guide the management of hapū data held by external organizations, ensuring whakapapa data remains under collective care. Ultimately, whānau and hapū are best placed to be kaitiaki of their whakapapa information, as they have been for generations. This aligns with broader IDSov scholarship, affirming Indigenous Peoples have maintained protocols for storing, sharing, protecting, and using their data, guided by cultural principles grounded in interconnected relationships with whenua and ecosystems (Halmai et al. 2025). These protocols reflect Indigenous ways of knowing and enable communities to assert rights in their data. By centering hapū perspectives in data protection, we can strengthen Hapū Data Sovereignty approaches that honor hapū connections to people, te taiao, and te ao wairua in digital environments.

Acknowledgments

E ngā tai mihi tāngata, ngā toka tū moana, te wai katokatonga o Te Pūaha mai i muri, mai i mua, ā, o nāianei, he maimai aroha noa ki a koutou. Tihei mauri ora. The authors acknowledge the whānau of Ngāti Tiipa, who shared with us their wisdom and knowledge. We thank the reviewers for their valuable feedback. Any errors or omissions are ours alone. This research was funded by a Ministry of Business, Innovation and Employment (MBIE) Endeavour Grant (UOWX2003) for the research programme *Tikanga in Technology: Transforming Māori and Indigenous data ecosystems*.

Open access publishing facilitated by The University of Waikato, as part of the Wiley - The University of Waikato agreement via the Council of Australian University Librarians.

Funding

This work was supported by the Ministry of Business, Innovation and Employment (MBIE) Endeavour (UOWX2003) for the research programme Tikanga in Technology: Transforming Māori and Indigenous data ecosystems.

Conflicts of Interest

No potential conflicts of interest was reported by the author(s).

Endnotes

[1] Te Awa Tupua (Whanganui River Claims Settlement) Act 2017, for example, recognizes that: "Te Awa Tupua is an indivisible and living whole, comprising the Whanganui River from the mountains to the sea, incorporating its tributaries and all its physical and metaphysical elements—"E rere kau mai te Awa nui, mai i te Kāhui Maunga ki Tangaroa.""

[2] For example "Ko Te Puke o Tahinga te maunga, Ko Waikato te awa" (The hill of Tahinga is the ancestral mountain, Waikato is the ancestral river) reinforces the relationship between the authors and their whenua, tupuna and awa.

[3] Rangipīpī Bennett, pākeke, personal communication during wānanga session with Ngāti Tiipa, 2024.

References

Bowen, J., and A. Hinze. 2022. "Participatory Data Design: Managing Data Sovereignty in IoT Solutions." *Interacting with Computers* 34, no. 2: 60–71. https://doi.org/10.1093/iwc/iwac031.

Braun, V., and V. Clarke. 2006. "Using Thematic Analysis in Psychology." *Qualitative Research in Psychology* 3, no. 2: 77–101. https://doi.org/10.1191/1478088706qp063oa.

Braun, V., and V. Clarke. 2019. "Reflecting on Reflexive Thematic Analysis. Qualitative Research in Sport." *Exercise and Health* 11, no. 4: 589–597. https://doi.org/10.1080/2159676X.2019.1628806.

Braun, V., and V. Clarke. 2021. "One Size Fits All? What Counts as Quality Practice in (reflexive) Thematic Analysis?." *Qualitative Research in Psychology* 18, no. 3: 328–352. https://doi.org/10.1080/14780887.2020.1769238.

Burgess, H., and T. K. Painting. 2020. "Onamata, Anamata: A Whakapapa Perspective of Māori Futurisms," In *Whose Futures?*. Edited by A.-M. Murtola and S. Walsh, 205–233. Economic and Social Research Aotearoa.

Carroll, S. R., I. Garba, O. L. Figueroa-Rodríguez, et al. 2020. "The CARE Principles for Indigenous Data Governance." *Data Science Journal* 19, no. 1: 43. https://doi.org/10.5334/dsj-2020-043.

Carroll, S. R., R. Plevel, L. L. Jennings, et al. 2022. "Extending the CARE Principles from Tribal Research Policies to Benefit Sharing in Genomic Research." *Frontiers in Genetics* 13. https://doi.org/10.3389/FGENE.2022.1052620.

Cheung, M. 2008. "The Reductionist – Holistic Worldview Dilemma." *Mai Review* 3: 1–7, https://www.journal.mai.ac.nz/maireview/article/751.

Collier-Robinson, L., A. Rayne, M. Rupene, C. Thoms, and T. Steeves. 2019. "Embedding Indigenous Principles in Genomic Research of Culturally Significant Species: A Conservation Genomics Case Study." *New Zealand Journal of Ecology* 43, no. 3. https://doi.org/10.20417/nzjecol.43.36.

Coltman, T., M. Hudson, J. Mika, et al. 2025. "Benefit Sharing on Genetic Resources: Modelling Data Access, Control and Willingness-to-Pay for Digital Sequence Information." *Ecological Solutions and Evidence* 6, no. 2: e70063. https://doi.org/10.1002/2688-8319.70063.

Connor, H. 2019. "Whakapapa Back: Mixed Indigenous Māori and Pākehā Genealogy and Heritage in Aotearoa/New Zealand." *Genealogy* 3, no. 4: 73. https://doi.org/10.3390/genealogy3040073.

Couldry, N., and U. A. Mejias 2019. *Data Colonialism: Rethinking Big Data's Relation to the Contemporary Subject*, 336–349. Television & New Media. https://doi.org/10.1177/1527476418796632.

Ekbom, A. 2011. "The Swedish Multi-Generation Register." *Methods in Biobanking* 675: 215–220. https://doi.org/10.1007/978-1-59745-423-0_10.

Evans, D. 2012. "Whakapapa, Genealogy and Genetics." *Bioethics* 26, no. 4: 182–190. https://doi.org/10.1111/j.1467-8519.2010.01850.x.

Forster, M. 2019. "He Tātai Whenua: Environmental Genealogies." *Genealogy* 3, no. 3: 3.https://doi.org/10.3390/genealogy3030042.

Gomes, C., S. Palomo-Díez, A. M. López-Parra, and E. Arroyo-Pardo. 2021. "*Genealogy*: The Tree Where History Meets Genetics." *Genealogy* 5, no. 4: 4. https://doi.org/10.3390/genealogy5040098.

Greaves, L. M., C. Lindsay Latimer, E. Muriwai, et al. 2024. "Māori and the Integrated Data Infrastructure: An Assessment of the Data System and Suggestions to Realise Māori Data Aspirations [Te Māori Mme Tte Integrated Data Infrastructure: he aromatawai i te pūnaha raraunga me ngā marohitanga e poipoia ai ngā wawata raraunga Māori]." *Journal of the Royal Society of New Zealand* 54, no. 2: 161–272. https://doi.org/10.1080/03036758.2022.2154368.

Greytak, E. M., D. H. Kaye, B. Budowle, C. Moore, and S. L. Armentrout. 2018. "Privacy and Genetic Genealogy Data." *Science (New York, N.Y)* 361, no. 6405: 857. https://doi.org/10.1126/science.aav0330.

Guerrini, C. J., J. O. Robinson, D. Petersen, and A. L. McGuire. 2018. "Should Police Have Access to Genetic Genealogy Databases? Capturing the Golden State Killer and Other Criminals Using a Controversial New Forensic Technique." *PLOS Biology* 16, no. 10: e2006906. https://doi.org/10.1371/journal.pbio.2006906.

Halbert, R. 1999. *Horouta: The History of the Horouta Canoe, Gisborne and East Coast*. Reed.

Halmai, N. B., R. Taitingfong, L. L. Jennings, et al. 2025. "Indigenous Data Sovereignty in Genomics and Human Genetics: Genomic Equity and Justice for Indigenous Peoples." *Annual Review of Genomics and Human Genetics* 26, no. 1: 375–400. https://doi.org/10.1146/annurev-genom-022024-125543.

Hammond, T. G. 1924. *The Story of Aotea*. Lyttelton times co., Ltd.

Harmsworth, G. R., and S. Awatere. 2013. "Indigenous Māori Knowledge and Perspectives of Ecosystems," In *Ecosystem Services in New Zealand – Conditions and Trends*. Edited by J. R. Dymond, 274–286. Manaaki Whenua Press, http://api.digitalnz.org/records/35867430/source

Hudson, M., A. L. M. Ahuriri-Driscoll, M. G. Lea, and R. A. Lea. 2007. "Whakapapa – A Foundation for Genetic Research?." *Journal of Bioethical Inquiry* 4, no. 1: 43–49. https://doi.org/10.1007/s11673-007-9033-x.

Hudson, M., N. A. Garrison, R. Sterling, et al. 2020. "Rights, Interests and Expectations: Indigenous Perspectives on Unrestricted Access to Genomic Data," *Nature Reviews Genetics* 21, no. 6: 6. https://doi.org/10.1038/s41576-020-0228-x.

Jones, P. L., K. Mahelona, S. Duncan, and G. Leoni. 2025. "Kaitiaki: Closing the Door on Open Indigenous Data." *International Journal on Digital Libraries* 26, no. 1: 1. https://doi.org/10.1007/s00799-025-00410-2.

Jones, P. T. H., and B. Biggs. 2004. *Nga Iwi o Tainui: Nga Koorero Tuku Iho a Nga Tuupuna = the Traditional History of the Tainui People ([New ed.]*. Auckland University Press.

Kawharu, M. 2000. "Kaitiakitanga: A Maori Anthropological Perspective of the Maori Socio-Environmental Ethic of Resource Management." *The Journal of the Polynesian Society* 109, no. 4: 349–370, https://www.jstor.org/stable/20706951.

Kling, D., C. Phillips, D. Kennett, and A. Tillmar. 2021. "Investigative Genetic Genealogy: Current Methods, Knowledge and Practice." *Forensic Science International: Genetics* 52: 102474. https://doi.org/10.1016/j.fsigen.2021.102474.

Kukutai, T., and A. Black. 2024. "CARE-ing for Indigenous Nonhuman Genomic Data—Rethinking Our Approach." *Science* 385, no. 6708: eadr2493. https://doi.org/10.1126/science.adr2493.

Kukutai, T., S. Cassim, V. Clark, et al. 2023. *Māori Data Sovereignty and Privacy. [Tikanga in Technology Discussion Paper]*. Te Ngira Institute for Population Research. https://tengira.waikato.ac.nz/__data/assets/pdf_file/0005/947444/MDSov-and-Privacy_20March2023.pdf.

Kukutai, T., and D. Cormack. 2019. "Mana Motuhake ā-Raraunga: Datafication and Social Science Research in Aotearoa." *Kōtuitui: New Zealand Journal of Social Sciences Online* 14, no. 2: 201–208. https://doi.org/10.1080/1177083X.2019.1648304.

Kukutai, T., N. Mahuika, H. Kani, D. Ewe, and K. H. Kukutai. 2020. "Survivance as Narrative Identity: Voices from a Ngāti Tiipa Oral History Project." *MAI Journal: A New Zealand Journal of Indigenous Scholarship* 9, no. 3: 309–320. https://doi.org/10.20507/MAIJournal.2020.9.3.11.

Kukutai, T., J. Whitehead, and H. Kani. 2022. "Tracing Opuatia: Repatriating and Repurposing Colonial Land Data." *New Zealand Geographer* 78, no. 2: 134–146. https://doi.org/10.1111/nzg.12344.

Law Commission. 2008. *Privacy Concepts and Issues: Review of the Law of Privacy Stage 1*. (No Study paper 19). https://www.lawcom.govt.nz/sites/default/files/projectAvailableFormats/NZLC%20SP19.pdf.

Law Commission. 2020. *The Use of DNA in Criminal Investigations (No. Report 144)*. Law Commission. https://www.lawcom.govt.nz/assets/Publications/Reports/NZLC-R144.pdf.

Lovett, R., V. Lee, T. Kukutai, D. Cormack, S. C. Rainie, and J. Walker. 2019. *Good Data Practices for Indigenous Data Sovereignty and Governance*. Edited by M. Mann, K. Devitt, and A. Daly, 26–36. Institute of Network Cultures. https://researchcommons.waikato.ac.nz/bitstream/handle/10289/12919/data%20practices.pdf;jsessionid=E05ACDF843D8F38839963AE574806020?sequence=5.

Mackey, T. K., A. J. Calac, B. S. Chenna Keshava, J. Yracheta, K. S. Tsosie, and K. Fox. 2022. "Establishing a Blockchain-Enabled Indigenous Data Sovereignty Framework for Genomic Data." *Cell* 185, no. 15: 2626–2631. https://doi.org/10.1016/j.cell.2022.06.030.

Mahuika, N. 2019. "A Brief History of Whakapapa: Māori Approaches to Genealogy." *Genealogy* 3, no. 2: 2. https://doi.org/10.3390/genealogy3020032.

Mahuika, N., and T. Kukutai. 2021. "Introduction: Indigenous Perspectives on Genealogical Research." *Genealogy* 5, no. 3: 63. https://doi.org/10.3390/genealogy5030063.

Mahuika, N., and R. Mahuika. 2020. "Wānanga as a Research Methodology." *AlterNative: An International Journal of Indigenous Peoples* 16, no. 4: 369–377. https://doi.org/10.1177/1177180120968580.

Mark, G., A. Boulton, T. Allport, D. Kerridge, and G. Potaka-Osborne. 2022. "Ko Au Te Whenua, Ko Te Whenua Ko Au: I Am the Land, and the Land Is Me": Healer/Patient Views on the Role of Rongoā Māori (Traditional Māori Healing) in Healing the Land." *International Journal of Environmental Research and Public Health* 19, no. 14: 14. https://doi.org/10.3390/ijerph19148547.

Marley, T. L. 2019. "Indigenous Data Sovereignty: University Institutional Review Board Policies and Guidelines and Research with American Indian and Alaska Native Communities." *American Behavioral Scientist* 63, no. 6: 722–742. https://doi.org/10.1177/0002764218799130.

Marsden, M. 1981. "God, Man and Universe: A Māori View." *Te Ao Hurihuri: The World Moves on: Aspects of Maoritanga*. Edited by M. King, 143–154. Longman Paul.

Mc Cartney, A. M., J. Anderson, L. Liggins, et al. 2022. "Balancing Openness with Indigenous Data Sovereignty: An Opportunity to Leave No One behind in the Journey to Sequence All of Life." *Proceedings of the National Academy of Sciences* 119, no. 4. https://doi.org/10.1073/pnas.2115860119.

Ministry of Economic Development. 2002. "*Bioprospecting: Harnessing benefits for New Zealand*," (Discussion paper).

Ministry of Justice. 2001. "*He Hīnātore ki te Ao Māori: A glimpse into the Māori world – Māori perspectives on justice*." 256. https://www.justice.govt.nz/assets/he-hinatora-ki-te-ao-maori.pdf.

Mitira, T. H. 1990. *Takitimu (Facsim)*, Te Rau Press.

Ngata, A. 2019. "The Terminology of Whakapapa (With an Introduction by Wayne Ngata)." *Journal of the Polynesian Society* 128, no. 1: 19–42, https://www.jstor.org/stable/26857330.

Privacy Commissioner. 2025. *Inquiry into Foodstuffs North Island Trial Use of Facial Recognition Technology (Report)*. https://www.privacy.org.nz/assets/DOCUMENTS/20250603-FRT-Inquiry-Report-A1082856.pdf.

Quince, K. 2016. "Māori Concepts in Privacy, *Privacy Law in New Zealand*. Edited by S. Penk and N. Chamberlain. 2nd ed. 29–52. Thomson Reuters New Zealand Ltd.

Quince, K., and J. Houghton. 2023. "Privacy and Māori Concepts," In *Privacy Law in New Zealand*. Edited by S. Penk and R. Tobin, 43–136. Thomson Reuters. https://papers.ssrn.com/abstract=4707570.

Roberts, M. 2013. "Ways of Seeing: Whakapapa." *Sites: A Journal of Social Anthropology and Cultural Studies* 10, no. 1: 9. https://doi.org/10.11157/sites-vol10iss1id236.

Shep, S., M. Frean, R. Owen, R.-N.-A.-R. Pope, P. Reihana, and V. Chan. 2021. "Indigenous Frameworks for Data-Intensive Humanities: Recalibrating the past through Knowledge Engineering and Generative Modelling." *Journal of Data Mining & Digital Humanities, HistoInformatics (HistoInformatics)* 6095. https://doi.org/10.46298/jdmdh.6095.

Smith, D. E. 2016. "Governing Data and Data for Governance: The Everyday Practice of Indigenous Sovereignty." In *Indigenous Data Sovereignty*. Edited by T. Kukutai and J. Taylor, 117–136. ANU Press. https://www.jstor.org/stable/j.ctt1q1crgf.14.

Smith, L. T. 2012. *Decolonizing Methodologies: Research and Indigenous Peoples, Second Edition*. 2nd ed. Zed Books.

Smith, T. 2000. "Nga Tini Ahuatanga o Whakapapa Korero." *Educational Philosophy and Theory* 32, no. 1: 53–60. https://doi.org/10.1111/j.1469-5812.2000.tb00432.x.

Stafford, D. M. 1991. Te Arawa: A history of the Arawa people. Reed.

Taani, P. 2022. "WHAKAPAPA: Our Ways of Knowing, Being and Doing." *MAI Journal: A New Zealand Journal of Indigenous Scholarship* 11, no. 2: 117–127. https://doi.org/10.20507/MAIJournal.2022.11.2.3.

Taylor, L., L. Floridi, and B. van der Sloot. 2017. "*Introduction: A New Perspective on Privacy*. Edited by L. Taylor, L. Floridi, B. van der Sloot Eds. and Group Privacy, 1–12. Springer International Publishing, https://doi.org/10.1007/978-3-319-46608-8_1.

Te Mana Raraunga. 2019. *Submission on the Law Commission Review of the Law Governing the use of DNA in Criminal Investigations in New Zealand*. https://static1.squarespace.com/static/58e9b10f9de4bb8d1fb5ebbc/t/5cb6bebee5e5f0de9a74beb7/1555480276058/Submission+on+Law+Commission+Review.pdf.

Te Puni Kokiri. 2023. *Bioprospecting Regime*. http://www.tpk.govt.nz/en/a-matou-whakaarotau/te-ao-maori/te-pae-tawhiti/bioprospecting-regime/.

Te Rito, J. S. 2007. "Whakapapa: A Framework for Understanding Identity." *Mai Review* 2: 1–10, https://www.journal.mai.ac.nz/maireview/article/684.

Tsosie, R. 2020. *The Legal and Policy Dimensions of Indigenous Data, Indigenous Data Sovereignty and Policy*. Edited by M. Walter, T. Kukutai, S. R. Carroll, and D. Rodriguez-Lonebear, 1st ed, 204–225. Routledge, https://doi.org/10.4324/9780429273957-14.

Tribunal, W., 2011. "*Ko Aotearoa Tēnei: A Report into Claims Concerning New Zealand Law and Policy Affecting Māori Culture and Identity, Te Taumata Tuatahi*." https://forms.justice.govt.nz/search/Documents/WT/wt_DOC_68356054/KoAotearoaTeneiTT1W.pdf.

Walker, R. 1981. "The Relevance of Maori Myth and Tradition," In *Te Ao Hurihuri: Aspects of Maoritanga*. Edited by M. King, 170–182. Longman Paul.

Walter, M., T. Kukutai, S. R. Carroll, and D. Rodriguez-Lonebear. 2020. *Indigenous Data Sovereignty and Policy*. Routledge, 1st, https://doi.org/10.4324/9780429273957.

Watts, D., and T. Kukutai. 2025. *Protecting Māori Data: Can a Māori Data Code of Practice Provide a Partial Solution? [Tikanga in Technology Discussion Paper]*. Te Ngira Institute for Population Research.

Webber, M., and K. O'Connor. 2019. "A Fire in the Belly of Hineāmaru: Using Whakapapa as a Pedagogical Tool in Education." *Genealogy* 3, no. 3: 41. https://doi.org/10.3390/genealogy3030041.

West, K., M. Hudson, and T. Kukutai 2020. "Data Ethics and Data Governance from A Māori World View." In *Indigenous Research Ethics: Claiming Research Sovereignty Beyond Deficit and the Colonial Legacy*. Edited by L. George, J. Tauri, and L. Te Ata o Tu MacDonald, 67–81. Emerald Publishing Limited, https://doi.org/10.1108/S2398-601820200000006005.

White, J. 1890. *The Ancient History of the Maori, His Mythology and Traditions*. Government Printer, http://archive.org/details/ancienthistoryof01whit.

Wilkinson, C., D. C. H. Hikuroa, A. H. Macfarlane, and M. W. Hughes. 2020. "Mātauranga Māori in Geomorphology: Existing Frameworks, Case Studies, and Recommendations for Incorporating Indigenous Knowledge in Earth Science." *Earth Surface Dynamics* 8, no. 3: 595–618. https://doi.org/10.5194/esurf-8-595-2020.