

TERTIARY STUDY PATHWAY ADVICE USING ARTIFICIAL INTELLIGENCE SYSTEMS BASED ON MĀORI DATA

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Over the past decade, entire industries have emerged that collect, store and process personal information. Artificial intelligence technologies have been a key part of these developments by offering new and innovative ways to analyse and gain insight from personal information. However, artificial intelligence can also exhibit systemic bias, particularly when processing data that may not fit anticipated models. Decisions made from data about indigenous peoples present particular risks of marginalisation and under-representation. This article considers issues of the governance and use of Māori data in the particular case of offering career and study path advice to university applicants.

Māori students are underrepresented in tertiary study, and providing support for greater access and outcomes for Māori is a priority for the education sector. Universities sit in a unique position of being independent of government, but with obligations to Māori and te Tiriti o Waitangi 1840. In this way, university use of Māori data exercises many of the issues arising from nascent recognition of Māori data sovereignty.

This article considers the basis of Māori data being a taonga (treasure) and examines the Waitangi Tribunal's previous approaches to intangible taonga, particularly in the Wai 262 claim. It suggests areas where the Tribunal's approach may be applicable to Māori data, and identifies shortcomings in existing legal frameworks that make them unsuitable to accommodate the community, as opposed to the individual, approach to personal information in Māori culture. Māori aspirations for sovereignty over their data are described and contrasted with contemporary Crown approaches to Māori engagement and control.

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The article describes how a university could design and operate an AI career path recommendation application that accounts for the unique qualities of Māori data, promotes Māori access and outcomes, and respects Māori sovereignty over their data. While specific to that scenario, the principles and reasoning may be more broadly applicable.

I Introduction

Qualification completion rates are a key measure of success for universities, and of interest to both funding bodies and potential students. It is no surprise that universities are keenly interested that students beginning tertiary study undertake a qualification that they are likely to complete. An attractive approach to supporting this objective is the use of artificial intelligence (AI) to consider the background of a prospective student and suggest study pathways that may be more likely to lead to successful completion.

The use of AI systems may allow many more factors to influence this recommendation beyond the grades in subjects previously studied. Grades alone are not an absolute predictor of success,¹ and this has led to the use of equity schemes to offer alternative entry pathways. Information about applicants that goes beyond grades tends to be more personal. How such information should be handled is especially important in the New Zealand context because of developing arguments that Māori should have increased levels of control over data about themselves and their whakapapa (genealogy, lineage).² This article will examine how a university could fulfil its Treaty of Waitangi obligations to Māori if it were to operate an AI course recommendation system (the AI application).

Part II of this article will begin with observations on the nature of personal information, and will then describe how AI systems would learn to make predictions on courses of

1 New Zealand Qualifications Authority *University Entrance Review 2016–2017: Discussion Document* (March 2017) at [4.2].

2 Unless specified otherwise, all translations are from Te Aka Māori Dictionary <www.maoridictionary.co.nz>.

study using a range of information about the applicant. This will highlight the level of reliability that can reasonably be expected from AI predictions and the limits of such systems. Part III will describe the Treaty obligations that New Zealand universities must observe in their role of providing tertiary education to all New Zealanders. Part IV will consider why Māori data has unique qualities, and how the expectation of Māori involvement in its governance arises. This Part will draw parallels between data and other taonga that have been identified as requiring the inclusion of Māori in their governance.

Part V will summarise opinions put forward by Māori groups, academics and international bodies on the unique qualities of Māori data, and how contemporary frameworks for governing the use of personal information do not adequately account for Māori data concepts. Arguments in this Part describe why Māori involvement in the governance of data is required both to deliver on Treaty guarantees of self-determination, and to avoid negative effects from taxonomies that do not properly account for the unique qualities of Māori data. Finally, Part VI will describe the ways in which Māori engagement in the design and operation of the AI application could be structured to properly account for the unique qualities of Māori data, allow appropriate Māori governance over the data and operate in a way that is consistent with a university's Treaty obligations.

II An Introduction to AI using Personal Information

A Personal Information as a Natural Resource

The idea that information about a person possesses different qualities, and attracts different rights and obligations when compared to other data sources — say a street map, or a sales catalogue — is inherently understood. However, the nature of that understanding is continually evolving. An early evolutionary leap was established by Samuel D Warren and Louis D Brandeis in their pivotal 1890 article “The Right to Privacy”, in which they identified that the value in personal information arose not from

the labour involved or degree of deliberation, but simply from “the right to one’s personality”.³

The scale of data available as a resource to be monetised has increased as part of the digital era. The oft-cited phrase “data is the new oil” was first attributed to mathematician Clive Humby in 2006 as he sought to extract value from the data that UK supermarket chain Tesco held about loyalty card holders.⁴ As tech giants replaced oil companies as the world’s most valuable businesses over the past decade, this quote seems increasingly prescient.⁵

The analogy to oil remains appropriate when considering the ownership of data. Oil, a natural resource, is often extracted by private companies that retain the profits from sale, while compensating landowners a token amount. Similarly, those that collect, process and extract value from data hold many of the rights that would indicate ownership of the data.⁶ The precedent set by the privatisation of natural resources appears to be well on the way to being adopted in how data is owned, sometimes in exchange for access to technology and services without a payment.

If personal information has qualities of a natural resource, it is unsurprising that the free market approach of privatisation has been the default position as the monetary value of data has become understood and unlocked. However, this stands in stark contrast to the views often expressed by indigenous peoples on the governance and use of natural resources, which are characterised by the key themes of self-determination, and collective ownership and responsibility. In the context of personal information, views have emerged on Māori data sovereignty and how governance and use of Māori data should be undertaken. The conflict identified by

3 Samuel D Warren and Louis D Brandeis “The Right to Privacy” (1890) 4 Harv L Rev 193 at 207.

4 Charles Arthur “Tech giants may be huge, but nothing matches big data” *The Guardian* (online ed, United Kingdom, 23 August 2013).

5 Jeff Desjardins “Chart: The Largest Companies by Market Cap Over 15 Years” (12 August 2016) Visual Capitalist <www.visualcapitalist.com>.

6 See John Edwards, Privacy Commissioner “Addressing the Power Asymmetry of the Big Tech Companies” (keynote presentation at IAPP ANZ Summit 2019, Sydney, 30 October 2019).

those working in this space stems from differences between western cultures and the Māori worldview on what personal information is and how it should be governed.

B AI Predictions of Social Outcomes

This section will provide a brief introduction to AI, establishing where career path advice exists in the context of AI applications and techniques. It will explain how AI algorithms learn to make predictions, and how existing data is used in that learning process. Finally, it will look at the type of data that would be used by an AI application to give career advice.

Algorithms influence almost all aspects of our lives. We may not see them, but they are the recipes that dictate what we see and hear in the media, the routes our GPS suggests we travel and how much we pay for groceries. They are the basis of the 21st century digital transformation, and although they may be simple or complex, they are pervasive in how businesses make decisions.

Algorithms model decision-making. They take one or more factors as inputs, and generate one or more outcomes. An algorithm itself is not inherently good or bad, but there is growing awareness that some applications can lead to ethically and morally questionable outcomes.⁷ Meanwhile, businesses looking for any advantage they can get have an increased appetite for complex algorithms that purport to exhibit AI.

Algorithms can be categorised in two ways: rule-based; and AI.⁸ Humans can construct rule-based algorithms using a fairly small set of inputs and well-defined steps. For example, eligibility to undertake a particular course of tertiary study may have prerequisite qualifications, certain grades may have to have been achieved and there may be a limited number of places in a programme. An algorithm that considered

7 See Sam Levin “New AI can guess whether you’re gay or straight from a photograph” *The Guardian* (online ed, United Kingdom, 8 September 2017).

8 Hannah Fry *Hello World: How to Be Human in the Age of the Machine* (WW Norton, New York, 2018) at 28.

these inputs and made a decision to accept an applicant could be undertaken by a human using pen and paper, albeit slowly.

AI algorithms emerge when the steps required to generate an outcome from the inputs are either too complex to be described usefully, or where it is not known whether such steps exist at all. In these cases, the AI is given an example set of inputs and corresponding 'correct' outcomes, and learns through trial and error how combinations of inputs can produce a 'correct' outcome. The fastest AI systems in the world can perform 200 quadrillion such calculations per second.⁹

While the basic concepts of AI were described 70 years ago by World War II code breaker Alan Turing, commercial interest has surged recently as organisations seek increased efficiency and competitive advantage in their operations.¹⁰ This pursuit of AI solutions has led to applications in new areas, and novel expectations about what can be achieved. Broadly, AI applications can be broken down into three categories: perception, judgement and prediction.¹¹

Perception algorithms often surpass human capacity. Processes such as image and content recognition are examples of perception algorithms. These lend themselves well to AI learning methods because there is little ambiguity in the correct answer — in image recognition, the picture either contains the item being searched for, or it does not.

Judgment algorithms build upon perception by attempting to discern something more about the content. Some errors are expected in judgment algorithms because there can be reasonable disagreement about the correct answer. As an example, AI can reliably perceive that there is a face in an image, but is less reliable at judging whose face it may be.

9 Jeanna Bryner "This Supercomputer Can Calculate in 1 Second What Would Take You 6 Billion Years" (15 June 2018) Live Science <www.livescience.com>.

10 AM Turing "Computing Machinery and Intelligence" (1950) 59 Mind 433.

11 Arvind Narayanan "How to recognize AI snake oil" (Arthur Miller Lecture on Science and Ethics, Massachusetts Institute of Technology, Cambridge, 18 November 2019) at 7–10.

It is the prediction algorithms category that is relevant to providing suggested courses of study and career pathways. Predictive AI is inherently less reliable because predicting the future is uncertain. However, with all three of these AI applications being collectively referred to as “AI”, we may ascribe to prediction algorithms the same accuracy as perception and judgment algorithms. In attempting to predict social outcomes, such as career pathways, we must be especially conscious of the limitations of what AI can achieve due to the inherent uncertainty in predictions and the potential for misplaced trust.

C How Would a Career Path AI Application Learn?

Before exploring the types of data that a prediction algorithm would need for career pathway advice, a basic understanding of how prediction algorithms ‘learn’ is required. For an AI to predict social outcomes, the most useful input is historical data about comparable people and how they have succeeded. This is how humans learn to make predictions too — by looking at what has happened historically in comparable situations. The advantage of an AI is the ability to process far higher quantities of data than a person ever could, and to recall it perfectly.

While there are a number of AI techniques that may be appropriate for this problem, the most suitable is a neural network learning approach.¹² Neural networks are particularly suited to complex relationships between many inputs and multiple possible outcomes — not just *yes* or *no*. They work by iterating repeatedly over the input data and reinforcing the connections that show the strongest link between input and desired outcome. Their downside is that they can be difficult to implement and require a level of expertise to operate.

For career path advice, the comparable set of people that would act as inputs would be previous graduates. Universities hold admission and academic information on a large number of previous students and, therefore, possess the necessary data from

12 For an introduction to neural networks that assumes high school mathematics knowledge, see the playlist at Grant Sanderson “Neural Networks” 3Blue1Brown <www.3blue1brown.com>.

which an AI system could learn. The basic steps that are performed for an AI to learn are as follows.¹³

First, the historic data is split into two sets: a training set; and a testing set. The AI learns from the training set and then uses the testing set to determine how well it learned.

Secondly, a neural network is established that takes the input data known about each person in the training set and looks at the associated outcome. The neural network makes a guess at relationships in the data where certain inputs consistently lead to the same outcomes. This is the training phase.

Thirdly, the neural network is 'tested' on the testing data. It attempts to predict an outcome from the inputs in the testing data based on the relationships established during training. The prediction is then compared against the actual outcome in the testing data to see how accurate the predictions were.

Fourthly, a score is generated that represents how accurate the predictions were. For example, if the neural network correctly predicted every outcome in the testing set the score may be 100, but if none were correct it would be zero.

This process is then repeated with different testing and training splits of the data. Neural networks with higher scores are merged with other high-scoring configurations to see whether they can generate an even higher score. The connections from low-scoring neural networks are discarded. Eventually repeated iterations will show no improvement in the score. At this point, the resulting neural network is ready to be made use of. This approach illustrates how the speed at which an AI can operate applies — while early predictions may be no better than random guesses, the ability to guess and improve billions of times will eventually lead to a good outcome if one exists.

13 Note that there are entire disciplines of study focused on how to best construct and tune a neural network, and generate a score. But this description is sufficient for our purposes.

Through understanding this approach, it becomes apparent that a recommendation made by the AI application to a single person contains a contribution from every student that has studied at the institution previously. This may be hundreds of thousands of people. The contribution of a person to the decision may be large if they share many similar relevant characteristics to the person receiving advice, or miniscule if they share few. This leads to the question of what the relevant characteristics or inputs would be for career pathway advice.

D What Data Would be Used in a Career Path AI Application?

There has not been significant research into the efficacy of AI career advice applications, with researchers noting that the lack of publicly available data sets impedes this work.¹⁴ Those that have examined the problem have used public profile information and posts to social media as their data source.¹⁵ One study found that when classifying a person into one of four possible job outcomes the accuracy is approximately 66 per cent.¹⁶

An analogous problem for predictive AI involving social outcomes is screening job applicants during the hiring process. This has parallels to career pathway advice in that qualifications, experience and interests will be relevant, and the predicted outcome is job or career suitability. Researchers at Cornell University have surveyed commercial products in this market and examined the feasibility of the various approaches used to predict an outcome.¹⁷ They noted that AI techniques seek to discover the relationship between certain traits and outcomes, but caution that “empirical correlation is no substitute for theoretical justification”.¹⁸ They ask: if an algorithm predicts that a higher cadence in a candidate’s voice indicates

14 Ye Liu and others “Fortune Teller: Predicting Your Career Path” in Association for the Advancement of Artificial Intelligence *Proceedings of the Thirtieth AAAI Conference on Artificial Intelligence (AAAI-16)* (California, 2016) 201 at 202.

15 Liu and others, above n 14, at 202; and Yu Lou, Ran Ren and Yiyang Zhao *A Machine Learning Approach for Future Career Planning* (Stanford University, 2010) at [2.1].

16 Liu and others, above n 14, at 206.

17 Manish Raghavan and others “Mitigating Bias in Algorithmic Hiring: Evaluating Claims and Practices” (6 December 2019) arXiv <www.arxiv.org>.

18 At 12.

higher job performance, should this be considered a genuine indicator if there is no explanation for why that is?¹⁹ When many data points about a person are potential inputs, coincidence may be the explanation rather than some apparent correlation.

These observations can guide us to an idea about what the inputs of an algorithm to predict student success might look like. It is the governance of this data that presents the issues addressed in this article. The inputs will be relevant characteristics about existing students as they entered a programme, with some theoretical basis for why each datum could predict success. Universities will be constrained to using the data they have historically collected about applicants. Research indicates that a student's positive perception of the value of a career improves their success in undertaking a relevant course of study.²⁰ If universities have not collected this perception information previously, the data does not exist in the testing and training sets to allow the AI to learn how it influences the outcome.

Data about applicants collected by universities fall into two general categories: socio-demographic; and academic.²¹ Age, gender and citizenship data are collected, as well as iwi links for those who identify as Māori. Some brief family information is gathered, such as the highest level of education by a parent, and whether the applicant or their family are from a refugee background. Previous academic qualifications are collected, and grade information is available through the New Zealand Qualifications Authority.

Utilising socio-demographic factors as the input to the AI application can present a significant risk because biases exist in the historical training data. For example, Ministry of Education data indicates that, compared with all university students,

19 At 12.

20 Melissa A Fuesting, Amanda B Diekman and Lynette Hudiburgh "From classroom to career: the unique role of communal processes in predicting interest in STEM careers" (2017) 20 Social Psychology of Education 875.

21 The author's survey of seven New Zealand university application processes.

Māori students have a lower degree completion rate.²² It would not be a desirable outcome for all Māori applicants to be advised against undertaking degrees longer than three years, such as a four-year engineering or law degree. However, positive relationships may also be found in socio-demographic data: an applicant with a refugee background may be more motivated — and, therefore, successful, as noted above — to study areas of human rights or global politics. Acknowledging the possible positive and negative implications of AI predictions based on socio-demographic data is important to the ethical and Treaty-consistent use of the technology.

Academic information is gathered for all applicants to ascertain whether a university entrance qualification has been achieved and whether course prerequisites have been met. Further information is collected depending on the course of study applied for. For example, attending medical school requires a series of interviews, while admission to an architecture programme requires the submission of a portfolio of work. Alternative entrance pathways for Māori and Pacific Island applicants include community support statements. These additional inputs may appear to provide a rich training opportunity for an AI, however predictions based on this data would be skewed, as the material only exists for those that were required to submit it. It does not allow the AI to learn how those that did not submit this additional material may have performed in these programmes. While the use of these inputs would not be entirely discounted, caution must be given to their weight.

While socio-demographic and academic data will be necessary to provide career advice, they may not be sufficient to provide fine-grained, precise and reliable predictions. The information available to universities is significantly richer than the social media posts examined in the studies noted above, however there are still many factors that would contribute to success in a course of study that are not available for an AI to utilise in learning. It must be kept in mind that the outcomes generated by such an application are a fallible prediction of the future.

22 *Factors associated with achievement in tertiary education up to age 20* (Ministry of Education, September 2018) at 4.

E Summarising the Risks of AI

Understanding the characteristics and limitations of the data used to train an AI is key to the quality of the outputs generated. Poor quality data will produce poor quality outcomes. A significant illustration of this was the 2016 launch of the “Tay” AI chatbot by Microsoft Research.²³ The data used to train the Tay AI were social media conversations that people initiated with the AI’s Twitter account.²⁴ Less than a day after beginning to engage with, and learn from, Twitter users, the AI was publicly stating its support for genocide.²⁵ While this may appear to be an extreme example, the problems with the AI were immediately obvious. Subtle biases in a predictive AI would be much more difficult to identify.

In this Part, I have identified that career path guidance is a type of predictive AI, and that the reliability of predictive algorithms can be overestimated. I have demonstrated that for an AI to learn how to give career path guidance it will need to be trained on information from potentially hundreds of thousands of people, and this information will be of a personal nature. I have identified that there must be some basis of explanation for why each category of data could determine an appropriate career path. I have also raised that there are questions about whether the data held by universities is rich enough to be sufficient to offer meaningful advice.

While the potential — and appetite — exists for AI career path advice, it comes with risks as to the use of data and the reliability of the advice given. In any endeavour involving a heightened risk, good governance is required to manage that risk. In the following Parts, I will look at the risk and governance of this application and the data used by it, particularly when Māori data is included in the system and Māori are potential users of the application.

23 Peter Lee “Learning from Tay’s introduction” (25 March 2016) Microsoft <www.blogs.microsoft.com>.

24 See TayTweets (@TayandYou) <<https://twitter.com/tayandyou>>. The account is now private.

25 Jane Wakefield “Microsoft chatbot is taught to swear on Twitter” (24 March 2016) BBC News <www.bbc.com>.

III Treaty Obligations on Universities

Universities are unique entities: they are a creation of statute and publicly funded, but are fiercely independent of government. As a public institution they are part of the mechanism by which the Crown meets its obligations to Māori in respect of education. This Part will consider the nature of those obligations, and how they may apply to the various aspects of designing, governing and operating the AI application.

The Waitangi Tribunal in the Wai 262 report states that in exercising its right to govern education, the Crown is obliged to include transmission of mātauranga Māori (Māori knowledge).²⁶ It also finds that mātauranga Māori as a system of knowledge is a taonga (treasure, anything prized) in its own right.²⁷ As such, the Crown has a duty to actively protect the taonga, which is part of the Crown's contribution to keeping Māori culture vital and relevant.²⁸ The Tribunal also expresses the view that transmission of mātauranga Māori, and Māori success in the education system, are valid Treaty interests and in the national interest, although Māori must assume their own responsibilities.²⁹

In *The Report on the Aotearoa Institute Claim Concerning Te Wānanga o Aotearoa*, the Tribunal expresses the view that the Crown has a duty to deliver "equality of educational opportunity" to Māori.³⁰ The report also acknowledges the finding in *The Wānanga Capital Establishment Report* that the partnership between Māori and the Crown involves the Crown acknowledging Māori "expectations, aspirations and rights in education".³¹

26 Waitangi Tribunal *Ko Aotearoa Tēnei: A Report into Claims Concerning New Zealand Law and Policy Affecting Māori Culture and Identity – Te Taumata Tuarua* (Wai 262, 2011) vol 2 at 555.

27 At 555.

28 At 556.

29 At 559.

30 Waitangi Tribunal *The Report on the Aotearoa Institute Claim Concerning Te Wānanga o Aotearoa* (Wai 1298, 2005) at 41.

31 Waitangi Tribunal *The Wānanga Capital Establishment Report* (Wai 718, 1999) at 45.

In addition, the Tribunal has examined the role of the Crown in providing healthcare to Māori in *The Napier Hospital and Health Services Report*.³² Healthcare and education are both social services that are required to improve historically poor outcomes for Māori, so the articulation of duties in healthcare may be applicable to education, particularly given the *Wānanga* view on equal outcomes.

The Tribunal observes that simply guaranteeing equal standards of healthcare may leave Māori at a disadvantage if access to services is more difficult for Māori. Instead, it expresses the view that the Crown's obligation extends to equality of access, and that physical, socio-economic and cultural barriers all exist.³³ The Tribunal goes on to explore whether the duty extends to equality of health outcomes. It notes that factors outside of the healthcare system play a significant role in health outcomes, and greater healthcare resources may not significantly improve the problem.³⁴ Equality of outcomes, they suggest, will be more likely when Māori disadvantage is reduced in general, but that some channelling of greater healthcare resources to the higher need would be expected.

These views lend themselves well to application in the tertiary education sector and the historic underrepresentation of Māori. They point to a duty on universities to deliver equality of access to Māori. However, based on this analysis, the need to deliver education to all New Zealanders would imply that equality of outcomes in university study will not be the exclusive responsibility of the institutions.

The Crown has a number of mechanisms that require public universities to deliver on these responsibilities to Māori. The Education and Training Act 2020, which is the statutory basis of New Zealand's universities, requires that the university Council acknowledge the principles of the Treaty of Waitangi,³⁵ and the Crown must approve the investment plan of the university.³⁶ In addition to the legislative requirement,³⁶ there

32 Waitangi Tribunal *The Napier Hospital and Health Services Report* (Wai 692, 2001).

33 At 62.

34 At 63.

35 Education and Training Act 2020, s 281(1)(b).

36 See s 424.

is guidance and an expectation in the Cabinet Manual that all public entities “accord a special recognition to Māori rights and interests”.³⁷ Te Arawhiti — The Office for Māori Crown Relations — was established in 2018 to help facilitate the government’s engagement with Māori.³⁸ Its resources provide a contemporary approach to Treaty partnership.

These materials provide guidance on how a university may generally engage with Māori, both through formal charters and policies, and informally through culture and practices. The following sections examine how existing institutional duties and capabilities, looked at through the novel lens of data, will guide universities in how they may appropriately work with Māori data in an AI system.

A The Principles of the Treaty

The principles of the Treaty are not the Articles of the Treaty, nor are they defined in statute. The concept of *the principles of the Treaty* originated in the Treaty of Waitangi Act 1975, and the application of the principles have developed over time in both the Tribunal and the common law to give a more flexible and contemporary application of the Articles of the Treaty. When the government needs to include Māori and Treaty dimensions in legislation, it typically achieves this by making reference to Treaty principles. Indeed, this is the case in the Education and Training Act. However, the Productivity Commission, in its 2014 review of regulatory practices, notes that good practice in upholding Treaty principles cannot be legislated.³⁹

In 1989, the government sought to provide clearer guidance on how Treaty principles would be incorporated into the operation of government departments by publishing *Principles for Crown action on the Treaty of Waitangi*.⁴⁰ Five principles were identified: government (kāwanatanga), self-management (rangatiratanga), equality, reasonable

37 Cabinet Office *Cabinet Manual 2017* (Department of the Prime Minister and Cabinet, 2017) at 2.

38 Te Arawhiti “About Us” <www.tearawhiti.govt.nz>.

39 New Zealand Productivity Commission *Regulatory Institutions and Practices* (June 2014) at 156.

40 See generally Department of Justice *Principles for Crown action on the Treaty of Waitangi* (Wellington, 1989).

cooperation and redress. Considering generally the role of universities in delivering on the Crown's responsibility to provide education, and specifically the risks posed by an AI career path application, the principles that would be particularly relevant address rangatiratanga, cooperation in governance arrangements for taonga and rights of equality, especially in cases where Māori have historically been disadvantaged.

This version of the principles — as well as those expressed by the Court of Appeal in *New Zealand Maori Council v Attorney-General*, which first considered the principles⁴¹ — proved controversial. Jane Kelsey argues that the use of Treaty principles perpetuates the marginalisation of tino rangatiratanga because they are sourced in a concept of partnership based on the Crown's role of government.⁴² Referring to early cases that examined the Treaty principles, she states that:⁴³

Via the concept of the principles the judgments had thus gone full circle and return to adopt the key elements of sovereignty in the English text [of the Treaty] at the expense of tino rangatiratanga in the Māori.

The lack of recognition of the 'absolute' aspect of tino rangatiratanga, and the dilution of control that comes from balancing Māori interests against those of others, has impeded Māori in establishing their own frameworks to apply tikanga,⁴⁴ in particular to taonga, including data about themselves and their whakapapa.

While Treaty principles are still a fundamental part of the implementation of Treaty obligations, relationships with Māori and the inclusion of tikanga in the operations of Crown entities have progressed past the point of requiring their acknowledgement.⁴⁵ The government's current guidance for policy development and implementation states

41 *New Zealand Maori Council v Attorney-General* [1987] 1 NZLR 641 (CA).

42 Jane Kelsey *A Question of Honour? Labour and the Treaty, 1984-1989* (Allen & Unwin, Wellington, 1990) at 216–217.

43 At 217.

44 The customary system of values and practices that have developed over time and are deeply embedded in the social context.

45 See Education and Training Act, s 281(1)(b).

that the Treaty is one of the major sources of New Zealand's constitution, and that tikanga can be relevant regardless of the inclusion of Treaty principles in legislation.⁴⁶

B Contemporary Crown approaches

Te Arawhiti has published an Organisational Capability Framework to assess an organisation's maturity in six areas relevant to supporting the Māori-Crown relationship.⁴⁷ Those areas are: governance; relationships with Māori; structural considerations; workforce capability; environment; and policy development and service delivery.⁴⁸ While all of the areas will be relevant to a university, four are particularly applicable to the operation of the AI application: governance; relationships with Māori; workforce capability; and policy development.

Key capabilities identified in the governance and relationships areas are the ability to appropriately share decision-making with Māori, the capability to measure Māori outcomes, and the importance of making outcomes from this partnership visible.⁴⁹ Workforce capability acknowledges that Māori cannot practically be continuously involved in every aspect of the operations of a large institution, and some internal capability in all staff to act in accordance with Treaty principles is required. Capabilities in service design speak directly to the need for the AI application to act consistently with Māori data principles and observe Treaty obligations, and to ensure that the outputs are beneficial to Māori and the institution.

On the capabilities of governance and relationships, Te Arawhiti has developed an exemplar for engagement with Māori that builds on the partnership and rangatiratanga Treaty principles.⁵⁰ The fundamental guidance is to engage early to fully understand the scope of the issue, and the cultural, environmental, social and economic impacts it may have on Māori. Through genuine engagement, Crown entities can respect

46 Cabinet Office Circular "Te Tiriti o Waitangi / Treaty of Waitangi Guidance" (22 October 2019) CO 19/5 at [2], [11] and [15].

47 Te Arawhiti *Māori Crown Relations Capability Framework for the Public Service - Organisational Capability Component*.

48 At [5].

49 At 3–4.

50 Te Arawhiti *Crown engagement with Māori*.

rangatiratanga, and improve policy and practice through inclusion of mātauranga Māori.⁵¹ Engagement also acknowledges that some issues disproportionately affect Māori, and that Māori are better placed to develop solutions to such issues — educational opportunity and outcomes present this challenge.

The guidance defines a range of engagement methods that may be appropriate depending on the matter that is under consideration.⁵² This is particularly relevant to the use of Māori data, and later Parts of this article will describe the different levels of involvement that will be appropriate depending on the mana (prestige, authority, status) of the data in question. Five levels are described: inform; consult; collaborate; partner or co-design; and empower.⁵³ The last of these describes a scenario in which Māori decide on an outcome and the Crown implements that decision. However, this would be a decision within the Crown framework and would fall short of the tino rangatiratanga Māori aspire to.

The guidance notes that early, effective and honest engagement develops more meaningful relationships with Māori, thereby reducing the future efforts and costs of engagement.⁵⁴ This supports the principle noted above that engagement is not ad-hoc and transactional, but is in support of an enduring relationship.

C Implementing Treaty Principles

If a university understood that it is a party to a partnership with Māori in delivering tertiary education, and is required to take positive steps to achieve equality, how would the university fulfil this duty? Proper observation of Treaty principles and contemporary guidance by a university will influence how Māori students are considered for admission to the institution, how they are supported during their studies, and how Māori culture and concepts are included in the curriculum and pedagogy. Different approaches may be appropriate when considering the acceptance

51 Te Arawhiti *Guidelines for engagement with Māori* at 2.

52 At 6.

53 At 6.

54 At 2.

of applicants to the university, the support offered and the delivery of teaching, and all of these will influence the design and training of the AI application.

Māori are underrepresented in tertiary education, and face greater socio-economic challenges in attending university. Where there are imbalances between Treaty partners, the Tribunal has suggested a “double trusteeship” where the duty is to protect the Māori duty to protect and strengthen themselves.⁵⁵ An approach adopted by universities has been to provide alternative admission criteria for Māori students in order to recognise social and cultural, as well as academic, achievements.⁵⁶ A scheme designed and overseen by Māori would be one example of how a university could enable Māori to protect and strengthen their participation in tertiary education.

Once admitted, all New Zealand universities offer competitive scholarships for Māori to address economic challenges, and specific academic and pastoral care to assist Māori students from different backgrounds in adapting to the expectations of tertiary education. While these schemes can be seen as examples of active protection of the ability of Māori to attend university, they do not provide protection and partnership for Māoritanga within the education delivered. The approach that universities take to the inclusion of mātauranga Māori in the curriculum appears to be inconsistent at present, and yet the inclusion of mātauranga Māori has been identified by TEC as fundamental to Māori doing well.⁵⁷

Alternative admission schemes, inclusion of mātauranga Māori in the curriculum and targeted support for Māori students may present sources of bias in the AI learning process. All three initiatives are constantly improving, but their maturity in achieving equal access and improving outcomes for Māori may not be consistent across all subjects. A subject with strong support and curriculum inclusion would likely result in higher rates of success by Māori undertaking that course of study. However, if the

55 Waitangi Tribunal *Te Whānau o Waipareira Report* (Wai 414, 1998) at 16.

56 See University of Auckland “Undergraduate Targeted Admission Schemes (UTAS)” <www.auckland.ac.nz>; and Victoria University of Wellington “Special Admission” <www.wgtn.ac.nz>.

57 Fleur Chauvel and Jacqueline Rean *Doing Better For Māori in tertiary settings: Review of Literature* (Tertiary Education Commission, 2012) at [2.2].

data used to train the AI application was gathered predominantly prior to the introduction of the three initiatives, the recommendation would be biased due to the inclusion of out-of-date data that no longer represented the current state.

The principle of equality, and the government strategy to improve Māori outcomes, imply that the AI application should prioritise positive outcomes for Māori in its use. To achieve this, there must be awareness of potential sources of bias in training data, and steps must be taken to remove negative effects. The Treaty principle of rangatiratanga dictates that Māori should make decisions on how Māori data is used. But training an AI and identifying bias in the outputs is highly-specialised work. The obligation on a university would be of the 'double trusteeship' type, requiring that the institution provide the technical support and specialist knowledge to allow Māori to exercise rangatiratanga over the data and make informed decisions about how it is used. The next Part will further discuss the duties applying to Māori data.

IV Māori Data

When using an AI system to make career path recommendations, the data used to train the AI, and the data a prospective applicant may input into the system, are the keys to its operation and success. Good quality data will lead to better outcomes. However, there are considerations concerning the ethical and legal extent to which data can be used. The Privacy Act 2020 describes legal principles related to the use of personal information.⁵⁸ However, there is a significant contemporary focus on Māori rights to data about individuals, iwi and whakapapa that go beyond what is considered in the legislation. The origin of this expectation is Māori aspirations to exercise tino rangatiratanga over their taonga. But, as discussed above, there is disagreement about the practicalities of this, which arises from competing interests in the data.

While the Tribunal has not yet considered whether Māori data is a taonga, there are strong academic and community expectations for this proposition, and support for the

58 See Privacy Act 2020, s 22.

existence of some consistent elements of tikanga to guide use of Māori data.⁵⁹ Te Mana Raraunga – The Māori Data Sovereignty Network — is a strong advocate for tikanga-consistent use of Māori data, and has published principles on the realisation of Māori rights and interests in data.⁶⁰ Academic research supports the proposition, examining many of the bases of the arguments.⁶¹ Moreover, the Māori right to data about themselves is aligned with international norms, specifically art 3 of the United Nations Declaration on the Rights of Indigenous Peoples, which expresses the right to self-determination.⁶²

However, academic and community support on issues of Treaty interpretation do not place legal obligations on universities. Matthew Palmer describes the Treaty as “half in and half out of the law”.⁶³ While not directly enforceable in the courts, the inclusion by New Zealand’s universities of Māori support in admission and study programmes has demonstrated some adoption of contemporary approaches to partnership with Māori in the delivery of education. However, that support is typically incorporated into existing functions in the institution, and limited to what can be practically achieved when balanced with other investment priorities. Whether universities would be willing to lead on the adoption of Māori data sovereignty is yet to be determined.

In the absence of a Tribunal report on the taonga status of Māori data, this Part will consider how the Tribunal has examined the taonga status of novel claims in the past. The Tribunal has previously considered the taonga value of other intangible assets, such as language and radio frequencies. Further, the Wai 262 report makes significant points on the treatment of intellectual property in taonga works, species and customs. By analysing the relevant reports, we can identify the aspects that the Tribunal might

59 The Tribunal is expected to hear arguments on the taonga status of data as part of the Wai 2522 investigation into the Trans-Pacific Partnership Agreement later in 2020. See Waitangi Tribunal *The Report on the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (Pre-publication Version)* (Wai 2522, 2021).

60 Te Mana Raraunga “Principles of Māori Data Sovereignty” (Brief 1, October 2018).

61 See Karaitiana Taiuru *Why Data is a Taonga: A customary Māori perspective* (November 2018); and Hēmi Whaanga, Te Taka Keegan and Mark Apperley (eds) *He Whare Hangarau Māori: Language, culture & technology* (University of Waikato, Hamilton, 2017).

62 *United Nations Declaration on the Rights of Indigenous Peoples* GA Res 61/295 (2007) [UNDRIP].

63 Matthew Palmer *The Treaty of Waitangi in New Zealand’s Law and Constitution* (Victoria University Press, Wellington, 2008) at 25.

find important when it comes to investigate how Māori data should be treated, and the sorts of consideration that should be given to its use. In any case, it is important to note that the Tribunal does not operate a system of precedent, so these parallels can be considered illustrative only.

A Tribunal Approaches to Intangible Taonga

The subject of the earliest Tribunal reports were land, rivers and fisheries — tangible items that flow from the English text of Article 2 of the Treaty. The *Report of the Waitangi Tribunal on the Motunui-Waitara Claim* is the first report to note that interpreting the Māori text reference to taonga katoa (all treasured things) as itemised specifics, as English canons of construction may do, would be entirely inappropriate.⁶⁴ The report notes that the interpretation of taonga katoa should be metaphorical and consider a variety of possible meanings. This approach acknowledges that things that Māori did not turn their minds to at the time the Treaty was signed may nonetheless be taonga.

The Tribunal further developed this approach to intangible taonga in the 1990 *Report of The Waitangi Tribunal on Claims Concerning the Allocation of Radio Frequencies*.⁶⁵ This report notes the essential difference of discovery, namely that while the spectrum was not evident when the Treaty was signed, with hindsight we know it always existed.⁶⁶ In contrast to previous findings, the view expressed in this report was that because of this difference, and the universal nature, it was a taonga to be shared by all mankind, and neither Treaty partner could have *monopoly rights*.

The Tribunal took the position that “the radio spectrum cannot be regarded in the same way as other taonga” because it had not been discovered in its modern form at the time the Treaty was signed.⁶⁷ This approach, when applied to Māori data, turns on

64 Waitangi Tribunal *Report of the Waitangi Tribunal on the Motunui-Waitara Claim* (Wai 6, 1993) at 50.

65 Waitangi Tribunal *Report of The Waitangi Tribunal on Claims Concerning the Allocation of Radio Frequencies* (Wai 26, Wai 150, 1990).

66 At [8.3].

67 At [8.3].

the different perspectives of what data is. It would be nonsense in 1840 to ask either party to the Treaty about the use of data in AI systems. However, this approach conflates the platform and technology-making use of the data with the data itself. If asked whether the oral history of ancestors and familial relationships were taonga, the answer would certainly be yes.

On this basis, the fact that current uses of data were not considered in 1840 would not preclude Māori obtaining a *monopoly right* on its use. This opens the way to a legitimate expectation by Māori that data about Māori is a taonga, and that they should be afforded rights of tino rangatiratanga in relation to it. But this may not extend to all data about Māori — contemporary types of data that have been introduced by Western society, such as tax details and criminal convictions, may fall outside of this definition.⁶⁸

B Contemporary Approaches to Taonga

The Wai 262 report is wide-ranging and touches on many historic and contemporary issues. While the report does not address data, many of the claims and findings that relate to taonga works and species are directly relevant, as is the relationship between the taonga work and those who created and care for it. These characteristics are similar to those of data, and the people and relationships that the data represents, and acknowledged in the government response to the report in which Māori data governance is addressed alongside proposals for taonga works.⁶⁹

A significant aspect of the report concerned artistic and cultural works, and the relationship of the creators and those responsible for safeguarding those works in the kaitiaki (trustee, guardian) relationship.⁷⁰ This aspect of the claim centred on shortcomings in New Zealand's intellectual property laws that failed to provide

68 Memorandum from Kahui Legal to the Independent Māori Statutory Board regarding Māori Data Sovereignty – Rights, Interests and Obligations Analysis (17 November 2016) at [65(c)].

69 Te Puni Kōkiri *Wai 262 – Te Pae Tawhiti: The role of the Crown and Māori in making decisions about taonga and mātauranga Māori* (August 2019) at 20.

70 Waitangi Tribunal *Ko Aotearoa Tēnei: A Report into Claims Concerning New Zealand Law and Policy Affecting Māori Culture and Identity – Te Taumata Tuarua* (Wai 262, 2011) vol 1 at 31.

adequate protection and recognition of taonga works and species. The framing of this claim was innovative: previous claims had generally centred on grievances stemming from Crown actions, whereas this claim primarily concerned the actions of third parties, often for commercial benefit, and the Crown's inaction in enacting appropriate limits. This is particularly relevant to the use of Māori data, and the lack of statutory recognition and protection.

The report helpfully describes why artistic and cultural works are considered taonga. These works invoke ancestors and whakapapa, and contain and reflect traditional narrative and stories.⁷¹ They represent Māori. This definition is closely aligned to the arguments for why data is a taonga: that the data embodies Māori, their ancestors and their environment.

The claim had two objectives in relation to taonga works: to establish Māori control; and to prohibit offensive uses.⁷² These goals are largely equivalent to those sought for Māori data, especially if offensive use of taonga works is considered analogous to: unconsented use of Māori data; or use that may lead to adverse outcomes for Māori. Therefore, it is useful to examine how the Tribunal addressed these aspects of the claim.

The Tribunal rejects the claim for Māori ownership and control of all taonga works, primarily for practical reasons.⁷³ Recognising that for 170 years Māori have been “socially, culturally and economically swamped”, the possibility of delivering full control of all taonga to Māori — taonga that may now be widespread and put to many uses — is seen as simply too disruptive.⁷⁴ This recommendation aligns with the “contemporary” approach to tino rangatiratanga discussed above, and is justified by the argument that, although Māori sovereignty and self-determination are

71 At 96.

72 At 45.

73 At 16–17.

74 At 16.

constitutional guarantees of the highest order, the obligation on the Crown is not absolute, but is rather *to the greatest extent practicable*.⁷⁵

The Tribunal's recommendation is a sliding scale approach, where, depending on the situation, Māori may have full authority, may participate in shared decision-making, or may influence decisions of others through consultation. This is consistent with the arguments discussed in the next Part that the taonga value of data may be variable, allowing a range of governance approaches.⁷⁶

However, the factors the Tribunal identifies that influence this assessment are more than just the nature of the data and the use to which it was to be put. The Tribunal recommendation for taonga works introduces a further consideration of the *practicality* of Māori governance. This recommendation to consider practicality differs from Māori aspirations of tino rangatiratanga, and from the academic and community approach that will be discussed below, according to which this factor is not given significant weight. While the recommendation will be influenced by the jurisdiction of the Tribunal to consider an application of the Treaty that is *practical*, when considering that the use of Māori data is not a clean slate, it is likely that this practical aspect will feature significantly in any approach adopted by the Crown.⁷⁷

Other relevant recommendations were made to: establish a commission or expert body that could receive and administer objections to the use of taonga works, either because the use was offensive or the minimum standard of consultation had not occurred; and to provide advice on the use of taonga works.⁷⁸ A parallel to this would be a body that could advise on the use of Māori data. The Māori Data Sovereignty Network has undertaken such a function since 2015. However, this is not a Crown initiative and would require a mandate to perform such a role.

75 At 16.

76 See Māui Hudson and others "'He Matapihi ki te Mana Raraunga' - Conceptualising Big Data through a Māori lens" in Hēmi Whaanga, Te Taka Keegan and Mark Apperley (eds) *He Whare Hangarau Māori: Language, culture & technology* (University of Waikato, Hamilton, 2017) 64.

77 Treaty of Waitangi Act 1975, long title and preamble.

78 See Waitangi Tribunal, above n 70, at 93–96.

1 Criticism of the Wai 262 report

While the Wai 262 report was a world first in the recognition of indigenous rights, it has also been criticised as not going far enough. Moana Jackson, one of the authors of the claim leading to the Wai 262 report, states that although “you can read a Tribunal claim as either glass half full or glass half empty ... the report leaves a number of quite fundamental issues unaddressed”.⁷⁹ Criticisms of the Tribunal approach most relevant to a potential application to Māori data may illustrate where taking a similar approach with Māori data may fall short of meeting Māori expectations.

Fleur Adcock notes that under the reforms proposed by the report, it will be rare for Māori to be able to exercise full authority and control over their taonga works.⁸⁰ Without full control and ownership, the proposition that Māori can exercise kaitiakitanga (guardianship) and have responsibility for the safekeeping of the work as guardians has been described as “illogical and culturally flawed”.⁸¹

The Wai 262 report describes Māori as having a kaitiaki *interest* in taonga works.⁸² As discussed above, the Tribunal recommends a sliding scale approach to Māori control, with Māori interests being balanced against interests other parties may have. One reading of this is that the Crown’s Treaty obligations require this to be interpreted as a default position of full control by Māori unless a compelling reason otherwise exists.⁸³ However, the report notes that no single interest should be a trump card, and the goal is a win-win for all interested parties if one exists.⁸⁴ Compromises and balancing acts will typically result in an outcome somewhere in the middle of all available options — such is the nature of a balance. When considering the range of the sliding scale, with full control by Māori situated at one end of the options,

79 Piripi Moore “Wai 262 - Moana Jackson aspirations.wmv” (1 July 2011) YouTube <www.youtube.com> at 0:11–0:16 and 3:11–3:17.

80 Fleur Adcock “Diluted control: a critical analysis of the Wai 262 report on Māori traditional knowledge and culture” in Matthew Rimmer (ed) *Indigenous Intellectual Property: A Handbook of Contemporary Research* (Edward Elgar Publishing, Cheltenham, UK, 2015) 497 at 509.

81 Moore, above n 79, at 2:29–2:42.

82 Waitangi Tribunal, above n 70, at 99.

83 Carwyn Jones “Wai 262 – The Tribunal’s general approach” (4 July 2011) Ahi-kā-roa <www.ahikaroa.wordpress.com>.

84 Waitangi Tribunal, above n 70, at 196.

it seems unlikely that a result will be found at this end-point more than very occasionally, especially when that range is defined within Te Ao Pākehā.

A significant concern is that New Zealand's private property rights intellectual property regime results in the "commodification of taonga".⁸⁵ Rather than recommend a *sui generis* legal framework to accommodate kaitiaki roles, the Tribunal recommends the establishment of expert bodies to identify circumstances in which: existing kaitiaki interests mean that intellectual property rights should not be awarded to applicants for taonga species;⁸⁶ or the commercial exploitation of taonga works should be disallowed.⁸⁷ While disallowing private property-style rights for taonga in certain circumstances, this approach does not accommodate Māori concepts of rangatiratanga or kaitiakitanga in the legal framework.⁸⁸ This is a very relevant concern for Māori data. In attempting to apply the individual-focused privacy regime to govern Māori data, there is a high risk that those aspects most key to Māori data — the whakapapa relationships — are entirely ignored because they do not fit into the framework.

2 Existing legislative protections for Māori data

The view that intellectual property rights in taonga works and species can be adequately accommodated within the existing intellectual property regime by the addition of expert bodies raises a question about whether a similar recommendation could achieve adequate outcomes for Māori data. By analogy to the Tribunal's recommendations in the Wai 262 report, this may take the form of an expert group that could assist in applying existing legislative protection and specialist advice to achieve outcomes sought by Māori.

The primary Act that offers protections for personal information is the Privacy Act. Notably, that Act makes no mention of the Treaty principles. The 2010 Law Commission Issues Paper on the Privacy Act 1993, the precursor to the Privacy Act 2020, lists key

85 Adcock, above n 80, at 512.

86 Waitangi Tribunal, above n 70, at [2.9.3].

87 At [1.9].

88 However, the question of a legal framework is noted as a possibility in the government response to Wai 262. See Te Puni Kōkiri, above n 69.

issues with applying the existing legislation to Māori data, the two most relevant being that: there are tensions between Western concepts of privacy and Māori collective interests; and Māori are concerned that information may be used in ways that are disempowering, derogatory or reduce mana.⁸⁹

The Law Commission's final report in 2011 acknowledged that the Privacy Act 1993 was ill-equipped to accommodate collective interests, and suggests the answer lies in special legal mechanisms in other statutes concerning areas of specific interest to Māori.⁹⁰ The report does note the Office of the Privacy Commissioner's comments that the Act is flexible enough to be applied in culturally appropriate ways.⁹¹ It goes on to make the recommendation that s 14, which required the Privacy Commissioner to have regard to certain matters, should be amended to include Māori needs and cultural perspectives.⁹² However, the legislature did not incorporate this recommendation into the Privacy Act 2020.⁹³ The view that the Privacy Act is not structured to accommodate Māori rights and interests in data, and Parliament's decision to not develop it in this direction, are strong indications that the existing privacy regime is not the appropriate place to find protection for Māori rights to their data.

The next Part will consider in greater depth the views put forward by Māori and others about what a *sui generis* framework to protect Māori rights and interests in data might look like.

V What is Different About Māori Data?

Part V surveys the work of persons and groups that present arguments for why Māori data has distinct qualities that require different protection mechanisms. Support for this proposition falls into two familiar and complementary categories:

89 Law Commission *Review of the Privacy Act 1993: Review of the Law of Privacy Stage 4* (NZLC IP17, 2010) at 458–459.

90 Law Commission *Review of the Privacy Act 1993: Review of the Law of Privacy Stage 4* (NZLC R123, 2011) at [12.39]–[12.40].

91 At [12.41].

92 At [12.42].

93 See Privacy Act 2020, s 21.

first, Treaty rights to self-determination confirm pre-existing Māori rangatiratanga over their data; and, secondly, contemporary frameworks for managing personal information are not properly designed to capture and manage data about Māori people and society. Failing to account for these arguments has led to poorer outcomes for Māori. What is sought is Māori inclusion in the design, governance and operations of systems that incorporate Māori data.

A fundamental part of Māori culture and society is the tradition of oratory — the recounting and transfer of information about people, places, ancestors and the world. Rather than information being stored, protected and transmitted in databases or written form, it is passed along orally. Data shared in this way describes the world around Māori. The persons who hold and pass the knowledge on gain mana. When information is passed on in this way it will not be tightly compartmentalised and categorised, as contemporary models of storing and transmitting data tend to be. Information about people may be communicated alongside information about ancestors, families, lands and other related subjects. In this way, information about individuals is inherently linked to, and combined with, other related information. Nin Tomas describes this as, “a natural emphasis ... placed on linking rather than disassociating objects from each other”.⁹⁴

The scope of information that is personal to Māori is, therefore, wider than would be assumed within Western cultures, where it is typically limited to information about the individual. Information about ancestors, members of whānau, hapū and iwi is as personal to Māori individuals as information about themselves personally. Whakapapa extends beyond the scope of individuals, and includes environments that have historical or contemporary links to Māori, and that form the cosmological origins of the world. The Privacy Act defines personal information as “information about an identifiable individual”.⁹⁵ This makes no accommodation for ideas of

94 Nin Tomas “Key concepts of tikanga Māori (Māori custom law) and their use as regulators of human relationships to natural resources in Tai Tokerau, past and present” (PhD thesis, University of Auckland, 2006) at 103.

95 Privacy Act, s 7(1) definition of “personal information”, para (a).

whakapapa — the communal or collective links that place each Māori individual as an integral member of a wider family, tribe and natural world.

However, Māori and contemporary Western views of personal information share some fundamental qualities. Khylee Quince notes that tapu (something sacred or with the potential to hold power or mana) provides a good analogy to Western concepts of privacy.⁹⁶ Information about Māori is tapu, and may only be used in ways that are consistent with tikanga. This is not dissimilar to the view expressed by Samuel D Warren and Louis D Brandeis that personal information has some inherent individualised quality, the nature of which restricts or limits the ways in which it may be used.⁹⁷

The wider scope of information that is personal to Māori has been summarised as “refer[ring] to data produced by Māori or that is about Māori and the environments [they] have relationships with”.⁹⁸ Other sources of Māori data have also been stated to include (although are not limited to):⁹⁹

- Data from organisations and businesses;
- Data about Māori that is used to describe or compare Māori collectives; and
- Data about Te Ao Māori that emerges from research.

Not all data that falls within this definition of Māori data will be sensitive and require different considerations in its use. Questions about whether data is taonga, and what level of mana it has, require consideration of the nature of the data, as well as wider factors. Te Kuru Dewes identified three factors that are indicative of the taonga value of a data set: “the Provenance of the data; the Opportunity for the data, and; the Utility of the data”.¹⁰⁰ This leads to questions of how the dataset originated and could support Māori aspirations, and other potential uses of the data

96 Khylee Quince “Māori Concepts and Privacy” in Stephen Penk and Rosemary Tobin (eds) *Privacy Law in New Zealand* (Thomson Reuters, Wellington, 2016) 29 at 33.

97 Warren and Brandeis, above n 3, at 207.

98 Hudson and others, above n 76, at 65.

99 At 65.

100 At 69.

beyond what it was gathered for.¹⁰¹ Further indicative questions may consider the spirit of the intended use, the relationship the user has with the data, and the expertise of the user and institution in storing and using data.¹⁰² This sits in contrast to Western concepts of sensitivity. Within New Zealand's legal framework, the question of how the data will be used will be fairly black and white: does the information fall within some statutory definition, such as personal information in the Privacy Act, and, if so, what permissions or restrictions are then applicable?

As noted above in the Law Commission Issues Paper, the wider definition of Māori data and graduated levels of sensitivity do not fit well with the individual-centric management of personal information. These approaches are unlikely to adequately capture the scope or relationships of data about Māori, or the factors that define sensitivity. In addition, the collective and interlinked nature of Māori data means that individual-centric governance (which is often based on individual consent and statutory protections) is not well-suited to accommodating Māori data.

An outcome of the strong whakapapa links between Māori people, ancestors, lands and the world is that inappropriate use of data about one individual may legitimately cause concern or injury to others. Use that is not tikanga-consistent will decrease the mana, not only of the individual, but potentially of the whānau, hapū and iwi as well. Contemporary models of personal information management and governance do not account for this collective involvement and interest in data.

As an example of this conflict, in contemporary approaches to information about people many rights disappear upon death. The Privacy Act specifically states that the protections contained in the statute only apply to living people.¹⁰³ However, the tapu nature of information about Māori would continue whether they are living or dead due to the continuing mana of ancestors. Williams J, in the case of *Ellis v R* in the

101 At 69.

102 At 71.

103 Privacy Act, s 7(1) definition of "individual", notwithstanding the s 32(6) exception for healthcare codes of practice.

Supreme Court, stated that “an ancestor has even more reputation to protect, is more tapu, has more mana”.¹⁰⁴

A framework that considered these wider factors could lead to outcomes where the same data had a different taonga value depending on the intended use of the data, who was working with it, and other considerations (as described above). This concept is quite foreign to the black and white protections afforded to information under the existing statutory regime — an organisation generally either has consent or a license to use data, or does not. However, holistic assessments are beginning to be adopted within contemporary privacy regimes. Statistics NZ provides access to sensitive personal microdata within the “Five Safes” framework: safe people, projects, settings, data and output.¹⁰⁵ The expertise of those using the data and the public good of the work are considerations in granting access. This framework shares similar assessment criteria with the approach described by Dewes to assess the taonga value of data, and indicates that the value in, and desire for, holistic sensitivity assessments is recognised beyond Māori data.

Te Mana Raraunga has published a Māori Data Audit Tool that guides persons collecting and working with data on what an appropriate framework might include.¹⁰⁶ Alongside its Charter, this will provide a starting point for those seeking to accommodate Treaty obligations in their collection and use of Māori data.¹⁰⁷ The overriding guidance is the inclusion of Māori within the design and governance of systems for collecting and using Māori data. Te Mana Raraunga Charter also observes that New Zealand is a signatory to the United Nations Declaration on the Right of Indigenous Peoples (UNDRIP), and states that use of Māori data must be consistent with those rights.¹⁰⁸

104 *Ellis v R* [2019] NZSC Trans 31 at 53.

105 Stats NZ “Integrated Data Infrastructure” (30 November 2020) <www.stats.govt.nz>.

106 Te Mana Raraunga “Resources: Ngā Rauemi” <www.temanararaunga.maori.nz>.

107 Te Mana Raraunga “Our Charter: Tūtohunga” <www.temanararaunga.maori.nz>.

108 Note that, although the phrase used in the Charter is “signatory”, the UNDRIP is not a treaty that is signed and ratified by member states.

A The UN Perspective on Indigenous Rights to Data

The UNDRIP is the international framework for expressing the rights of indigenous peoples, of which indigenous data sovereignty is an important aspect.¹⁰⁹ It does not create new rights in international law; rather, it is a framework that describes the minimum standards for the survival, dignity and well-being that should be afforded to indigenous peoples. The Cabinet Manual states that “New Zealand governmental institutions must increasingly have regard to international obligations and standards”.¹¹⁰ As such, the UNDRIP will influence domestic applications, at least to the extent that it is consistent with existing legal and constitutional frameworks.¹¹¹

Te Mana Raraunga expresses the view that New Zealand's support for the UNDRIP makes Māori data subject to those rights contained.¹¹² They note that the rights articulated are consistent with those in *The Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples*,¹¹³ produced by indigenous delegates from 14 countries, including New Zealand, and in the Outcome Document of the World Conference on Indigenous Peoples, under which New Zealand has made additional commitments.¹¹⁴ While these commitments do not go into depth on the topic of data sovereignty, they do reaffirm that indigenous peoples should have control over their own data. While the rights expressed in these declarations are not directly legally enforceable in New Zealand, they are influential and do provide guidance on good practice.

Significant work on indigenous rights to data has been undertaken by the United Nations Permanent Forum on Indigenous Issues (UNPFII), which is tasked with assessing the effectiveness of the UNDRIP.¹¹⁵ In particular, the UNPFII has

109 *UNDRIP*, above n 62.

110 Cabinet Office, above n 37, at 1.

111 Pita Sharples “Supporting UN Declaration restores NZ’s mana” (press release, 20 April 2010) at [8].

112 See *Te Mana Raraunga - Māori Data Sovereignty Network Charter* at 1.

113 *Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples* (26 July 1993), noting that the Crown has contested the standing of this document as it was not negotiated by and for states’ governments. See Waitangi Tribunal, above n 70, at 53.

114 *Outcome document of the high-level plenary meeting of the General Assembly known as the World Conference on Indigenous Peoples* UN Doc A/Res/69/2 (25 September 2014).

115 *Establishment of a Permanent Forum on Indigenous Issues* ESC Res 200/22 (2000).

conducted extensive investigations into the effects of failing to account for the unique aspects of indigenous data.¹¹⁶ A number of these observations are particularly relevant to the use of indigenous data in the AI application, and can illustrate how data frameworks that do not adequately account for Māori data characteristics can produce poor quality outcomes.

1 Pitfalls in working with indigenous data

The UNPFII has identified that access to data is an issue. Often, data about indigenous peoples was presented in conventional ways that omitted or downplayed the composition of indigenous groups. The UNPFII identified that both qualitative and quantitative data is required to adequately describe indigenous communities.¹¹⁷ Case studies, community testimonies and reports allowed for a holistic view of distinct indigenous peoples. However, it was noted that analysis of qualitative data could be problematic when standardised data for comparison is unavailable.

This is particularly the case with AI applications. As discussed above, Māori applicants to universities have alternative entrance pathways available. These options may focus greater attention on contributions to and involvement in community and culture. A recommendation from a kaumātua, for example, would be a subjective and qualitative indicator of the applicant. Despite significant attention on AI capabilities for natural language processing and sentiment analysis, this remains a relatively immature judgment application of AI and does not produce good data for an AI to learn from.¹¹⁸ Qualitative and subjective data does not provide a good basis for AI predictions.

116 *Report of the Workshop on Data Collection and Disaggregation for Indigenous Peoples* UN Doc E/C19/2004/2 (10 February 2004).

117 *Establishment of a Permanent Forum on Indigenous Issues*, above n 115, at [13].

118 See Jussi Karlgren and others “Usefulness of Sentiment Analysis” in Ricardo Baeza-Yates and others (eds) *Advances in Information Retrieval: 34th European Conference on IR Research, ECIR 2012* (Springer, Berlin, 2012) 426.

The UNPFII considered questions of what should be measured about indigenous peoples, and what should it be used for. It noted that data collected within indigenous groups often did not adequately capture and reflect social conditions.¹¹⁹ This shortcoming would disproportionately affect Māori due to higher prevalence of poor social conditions. As a result, the training data used by the AI could be skewed, or important characteristics about applicants could be missed.

A related challenge was noted in the design of surveys and data collection methods.¹²⁰ Questions would not always accurately reflect the situation of indigenous peoples and might be answered in ways that those interpreting the data had not anticipated. This may result in poor quality data due to limitations on how answers can be given.

The conclusions of the UNPFII Report, and the views of Māori and others that have examined the issue in New Zealand, are aligned: Māori must be involved in the design, governance and operations of applications that capture, contain and use Māori data.¹²¹ The rest of this article will examine how a university may work with Māori to achieve this outcome, within the scope of the AI application.

VI Making Appropriate Use of Māori Data

The previous Parts have identified two key propositions for the use of Māori data, and how a university must involve Māori in the design, governance and operation of applications that make use of Māori data. The first proposition is that the involvement of Māori must be effective and appropriate. The origin of this proposition is the guarantee of tino rangatiratanga over taonga. Involvement must additionally reduce the adverse effects of failing to account for Māori cultural structures when designing systems to capture and store data. The Treaty principle of reasonable cooperation requires that this involvement is genuine and structured, and indicates that specialist

119 *Establishment of a Permanent Forum on Indigenous Issues*, above n 115, at [24].

120 At [25].

121 This expectation is consistent (notwithstanding the different approaches to tino rangatiratanga) with the position taken by the Tribunal for taonga works, taonga species and other intangible taonga.

support may be required to assist Māori to understand the data so they can provide governance. The outcome sought from the partnership is that Māori data is used in a tikanga-consistent way.

The second proposition is that different types and contexts of data will have differing levels of mana. This proposition is supported by the examination of the factors that indicate the taonga value of data.¹²² As the mana increases, a greater degree of Māori control is required. However, this will be balanced with other interests in the data, as identified by the Tribunal in the Wai 262 report, and the contemporary approach to rangatiratanga being tempered by practical considerations.

Part VI will present approaches developed by others to deliver on these propositions, and then assess how a university could adopt them. The outcome expected from this adoption is that a university using Māori data in the AI application can do so in a way that actively protects Māori interests, respects tino rangatiratanga guarantees of taonga data and implements a system that leads to positive outcomes for Māori applicants.

A Partnership and Tikanga-consistent use of Māori data

Personal information attracts special rights in contemporary legal systems, and the rules on how those rights may be exercised are set out to be broadly and consistently applied. These right and rules are often found in domestic statutes,¹²³ but, due to the ease with which information can cross borders, international organisations also influence how personal information should be used.¹²⁴ Courts making case law — with a system of precedent and the principle of rule of law — interpret and apply these rules as consistently as possible.

Tikanga is a more fluid and flexible system. As a set of customary practices, tikanga can vary between iwi and across applications. Kerensa Johnston describes

122 See the discussion in Part V of this article.

123 Privacy Act, s 22.

124 See *The OECD Privacy Framework* (OECD, 2013). See also the United Nations initiatives discussed previously.

tikanga practices “as flexible because they are interpreted and applied differently in different regions, depending on local circumstances, preferences and history”.¹²⁵ It is through the development and application of tikanga that those that are the subject of data can define the ways in which it should be used. The implication is that a university seeking to make tikanga-consistent use of Māori data would be required to engage with iwi to understand appropriate practices. Designing appropriate engagement also raises the issue that in the AI application the interests of two groups must be considered: past applicants whose data is used to train the AI; and people submitting data to seek a prediction from the AI.

Te Mana Raraunga have identified and published a set of themes and practices that are common to the tikanga of Māori data.¹²⁶ These are separated into mana (governance) and mahi (operations) considerations. This split aligns well to the two groups that must be considered. For a *large* collection of data sourced from potentially hundreds of thousands of people, governance of the use of that data, and associated metadata, will be the key focus. For an *individual* submitting their data to the AI for a prediction, operational considerations regarding the use of that data, and the effect of a recommendation, will be the primary consideration.

1 Mana

Governance is concerned with the ability for an institution to oversee the use of data, and answer questions and address issues that arise during its use. This implies a requirement that the organisation has an understanding of tikanga and Te Ao Māori to undertake this function adequately.¹²⁷ Additionally, principles of self-determination dictate a level of hapū or iwi authority over the governance of data.

In practice, the capacity does not exist for all organisations working with any form of Māori data to have direct iwi involvement in every decision. This is where the variable

125 Kerensa Johnston “Māori Women Confront Discrimination: Using International Human Rights Law to Challenge Discriminatory Practices” (2005) 4 Indigenous Law Journal 19 at 30.

126 *Te Mana Raraunga - Māori Data Sovereignty Network Charter*, above n 112, at 3.

127 At 3.

taonga value of data and practical considerations, both discussed above, may lead to a spectrum of options: highly tapu data should be controlled by iwi; while, for data with no tapu value, it may be sufficient that Māori are informed of the use being made. Both of these ends of the spectrum (and other options in between) could constitute adequate self-determination when applied appropriately.

When options on a spectrum are proposed, a key question will always be: who defines the range of possibilities covered? It would be difficult to argue that Māori could exercise rangatiratanga over their data if they did not define the bounds of the spectrum. Constructing such a definition would involve a degree of specialist knowledge, and it is in this role that a group, such as Te Mana Raraunga, could provide valuable input. While the focus of this article is universities' obligations, rather than Crown obligations, the establishment or recognition of such a group by the Crown to assist in these matters would parallel the recommendation for expert bodies in the Wai 262 report. This would assist a university with engaging Māori in a meaningful way on the design of the AI application and the governance of the data contained within it.

2 Mahi

The operational side of Māori data covers how the data is collected, analysed and used. A key aim is to ensure that these operations are conducted ethically, for the benefit of Māori and to support Māori aspirations.¹²⁸ The obligation to conduct the operations ethically can be described as a social contract between the data users and Māori data subjects. The existence of this social contract presumes that: the data has been gathered with free and informed consent; and a foundation of the consent is that the use made of the data is what was consented to.

Secondary use of data, that being use that was not considered at the time the data was gathered, is a key consideration in ascertaining ethical use. As described in Part II, those entities that possess personal information on others enjoy many rights akin to ownership, and statutory restrictions on secondary use are scant. While the data may

128 At 4.

be collected for one purpose, clauses in the terms and conditions of the “consent” given upon collection (if there was consent at all) will often covertly permit: other use; transferring or selling the data to a third party; or the unilateral variation of the terms and conditions. Secondary use underpins many of the business models of tech giants and start-ups, offering ‘free’ services in exchange for data about the users. The maxim *if you’re not paying for it, you’re not the customer, you’re the product being sold* is entirely applicable.

Some protection against covert or unconsented secondary use may be developing within contemporary privacy models. The Privacy Commissioner announced an investigation into Trade Me’s unilateral change to terms of use of personal information in late 2019.¹²⁹ But when considering Māori data, unconsented secondary use of some types of data may additionally go against the principle of self-determination if a breach of the social contract occurred.

The outcome sought in the mahi of the AI application will be that data collected by the application is used in a way that is consistent with the social contract under which it was obtained. This will manifest in two ways: that the data is used for the purpose for which it was given; and that the recommendation made is in the best interests of the applicant. Both of these are aspects that will need to be continually assessed as new opportunities for the application and its data are identified, and ongoing learning leads to the risk of new biases.

B Applying the Mana and Mahi Framework

A key aspect that becomes clear when we consider the mana and mahi framework of using Māori data is that meeting tikanga obligations will require effort and skill. We have seen that contemporary taxonomies of personal information do not capture the whakapapa linkages and qualitative information that are fundamental to Te Ao Māori. Taxonomies would need to be customised to account for this, and to

129 Privacy Commissioner “Privacy Commissioner inquiry into Trade Me privacy changes” (media release, 20 December 2019).

accommodate information about how and for what reason the data was collected, in order to ensure consistency with the social contract. Further information would need to be kept to enable determinations of the taonga value of the data.

The extent of these obligations will vary depending on the nature of the data, and it should be Māori who conduct that determination. However, a minimum capability of tikanga comprehension must exist across the institution so that, in any new undertaking, those circumstances that require engagement with Māori can be identified. Universities must acknowledge that to meet these obligations will require a level of investment in training staff.¹³⁰

C Balancing Interests

By analogy to the taonga works and intangible taonga views expressed by the Tribunal, a consistent theme can be observed which implies that approaches to Māori data will need to be context-specific. Two significant aspects were identified that determine appropriate and practical use of Māori data: the taonga value of the data; and interests that others hold in the data.

For something to be taonga, it must be valued and treasured, and, in the case of data, the taonga value would reflect the mana or tapu status of that which the data represents. Kāhui Legal offers three illustrations of how this might be applied (from highest to lowest taonga value):¹³¹

- Whakapapa data is deeply “connected with who a person is” within their community, and “could be [seen] as part of their whakapapa in the genealogical sense”. Examples would include iwi affiliation, kaumātua testimonies, date of birth and DNA.
- Tāngata data “is connected with who a person is, but may [develop] over time”. This would be the case for health and education data.

130 This was highlighted earlier by the observation that universities were concerned about the workload on Māori staff in supporting their institutions’ engagement with Māori.

131 Kahui Legal, above n 68, at [65].

- Mea data “is about a person, but [not representative of] who they are from a genealogical sense”. Examples would include tax details and criminal convictions.

Mea data, which is reflective of Western social constructs, has the least taonga value, and is likely to be more suited to governance within contemporary information management and protection frameworks because the origin of this data is often from similar contemporary sources. Tāngata data would attract protections under existing frameworks, however there would be the added expectation of consultation with Māori to avoid adverse outcomes from the use of the data. Whakapapa data was acknowledged in the Law Commission Privacy Report as *least* suited to protection by contemporary frameworks,¹³² as this is the type of data that is most representative of concepts specific to Te Ao Māori.

The other axis of consideration is: the non-Māori interests in the data. This axis may serve to limit Māori control over data with high taonga value for “practical reasons”. The Tribunal acknowledged this limitation when considering the practicalities of Māori exercising tino rangatiratanga over all taonga. The Tribunal proposed three possible governance arrangements when considering a balance between mana and other interests in taonga works. These were: full Māori control; co-governance; and influence through consultation.¹³³ A fourth possibility of informed consent may exist for Māori data, this being applicable to what Kāhui Legal describes as Mea data, or data that is about Māori but holds no mana. The analogy to the Tribunal’s assessment of taonga works would be an artistic work produced by an artist who is Māori, but without any elements or claim of Māori culture — use would be governed by the provisions of the Copyright Act 1994 alone, rather than through the involvement of iwi.

While Mea data would be usable with informed consent, Tāngata data would require co-governance or consultation. Where there are few external interests, co-governance

132 Law Commission, above n 90, at [12.39].

133 Waitangi Tribunal, above n 70, at 16–17.

would be an appropriate mechanism. However, the ‘practicality’ of co-governance raised by the Tribunal may present a challenge when a large number of external interests in the data exist. Consultation with Māori, rather than co-governance, may be the “practical” approach when a large number of stakeholders or interests must be managed. However, to adopt the term used by the Tribunal, this is a “lesser option”, and obligations of good faith dictate that this outcome should only be applied where it is unavoidable.¹³⁴

Whakapapa data, as the data with the highest mana value, would come with the expectation of full Māori control over the use of the data. This high level of Māori oversight accords well with this type of data being most problematic to fit adequately into contemporary models of personal information. It also reflects the fact that subjective or qualitative information about a person, such as a recommendation from kaumātua, would fit in this category. As a challenging type of data for contemporary frameworks to accommodate, the highest level of oversight of its use is appropriate.

An issue will arise when data with a high taonga value also has a large number of external interests. The ‘practicality’ argument may suggest something less than full control by Māori. However, this type of data has the most potential for harm through misuse. That harm may be to the individual, but also to the whānau, hapū or iwi due to Whakapapa data being most highly linked to the collective nature of Māori society. This situation is where a dispute is most likely to arise.

D An Approach for Use of Māori Data in the AI Application

A challenge with any sliding scale approach is deciding who gets to determine the scale. The approach of Whakapapa, Tāngata and Mea data considered against the prevalence of other interests in the data goes some way to addressing this problem. The mana value of categories of data would be determined by Māori and objectively assessable in most instances, notwithstanding future changes in use that may change

134 At 16.

the assessment. The weighting given to external interests will be subjective, however. These principles can be applied to the data processed by the AI application using the mana and mahi framework discussed above.

When considering the mana or governance of the application, the first step, as highlighted by the Te Arawhiti engagement model, will be early engagement with Māori on the aspirations and intentions of the application.¹³⁵ The types of personal information to be used to train the AI would be identified by the university, and an assessment of the mana value of each would be undertaken by iwi. The notion of full control over Whakapapa data would mean that use of this data for training would be at the discretion of iwi.

Recalling the inputs to an AI predictor discussed in Part II, examples of types of data that may be considered Whakapapa data could be iwi affiliations, and parents' levels of education. While a simple categorisation on this basis may be attractive, in Part V a number of additional factors that indicate taonga value, beyond just the data type, were identified, such as the intended use and audience of the data.¹³⁶ For this reason, iwi involvement in making a determination is essential.

For Tāngata data, which would include academic results, a consultation relationship may be required rather than co-governance. This would arise from the high level of external interest in academic data, namely its standardisation by the New Zealand Qualifications Authority. As highly standardised data, there would be very little ability to influence the design, however iwi consultation on how the data was interpreted and used would ensure that the university was sufficiently informed to make high-quality decisions.

Appropriate training on tikanga concepts should be made available to those involved in the design, development and operation of the application. This would enable those closest to the application to be able to understand what tikanga-consistent operation

135 The details of how this engagement could occur is beyond the scope of this article. However, all New Zealand universities have established engagement processes with iwi from their regions.

136 Hudson and others, above n 76, at 69–71.

would entail, and to make an early identification of any areas that may require further consultation with Māori. This would meet the expectation expressed by Te Mana Raraunga that those working with Māori data have an understanding of the tikanga associated with it.

Turning to the mahi or operation of the AI application, an early consideration will be the design of the system to capture data from users of the application. The survey design, and the method of collection of Whakapapa data, would be determined by iwi to avoid the issues of miscommunication and incorrect assumptions identified in the UNPFII Report.¹³⁷ This would also support Māori sovereignty over the collection of highly tapu data.

Once the application is in operation, specific focus should be placed on auditing the results for any bias that may arise. The opportunity should exist for iwi to review samples of recommendations made, with sufficient specialist support to ensure the review is properly informed. Potential sources of bias arising from training data where the basis of the data may have changed, such as a recent establishment of better support services not available to previous students, would be identified through this process.

Over time, the purpose of the application may expand, and the data gathered may become useful in other contexts. Acknowledging that the university may have other legitimate interests in the data it has collected, consultation or collaboration with iwi would be the appropriate mechanism to ensure that any proposed expansion adhered to the social contract that was established in gathering the data.

These approaches can be considered an indicative starting point, and the purpose of early engagement with Māori would be to determine other areas where arrangements to properly make use of Māori data may also be required. However, it is hoped that by identifying these basic requirements for tikanga-consistent use — and their origins —

¹³⁷ *Report of the Workshop on Data Collection and Disaggregation for Indigenous Peoples*, above n 116.

some sense of the resourcing required to develop such an AI application can be understood and planned for accordingly.

VII Conclusion

Māori rights to data about themselves is not a recent concept. The expectation was stated 28 years ago in the text of the *Mataatua Declaration*.¹³⁸ However, as New Zealand's approach to Treaty protections moves from addressing historic grievances to examining nationally significant issues that affect all Māori, there is a greater opportunity to define and apply tikanga-consistent use of Māori data. Achieving improvements will not be without barriers, however, as entire industries have been built off the free market, and largely unconstrained, use of data. As noted by the Privacy Commissioner, the multinational giants monetising data are not inclined to fragment their services to account for minority rights.¹³⁹

Fortunately, New Zealand's universities have given greater emphasis to their partnership with Māori than to multinational tech giants. With the vast historic information held about Māori students, and the challenge for universities to enhance access and outcomes for Māori, universities are ideally placed to engage with iwi to introduce Māori data sovereignty practices.

However, this will not happen without investment in people, processes and partnerships. Part II of this article identified the risks associated with AI predictions, and these risks are amplified when considering the duties universities have to actively protect Māori interests in education, which were discussed in Part III. Part IV noted that existing statutory protections do not provide adequate support for the unique aspects of Māori data, but the concept of data about Māori being a taonga is not novel, and parallels exist in how protection for taonga works, species and other intangible taonga have been described. Part V highlighted that Māori are not alone in their expectation of sovereignty over data, with this being a focus for many

138 *Mataatua Declaration on Cultural and Intellectual Property Rights of Indigenous Peoples*, above n 113.

139 Edwards, above n 6.

indigenous peoples. It also identified conceptual differences between Māori views of personal information and contemporary Western approaches, and highlighted the dangers of failing to account for these differences when collecting and using Māori data.

Finally, Part VI suggested how a university could structure its approach to meeting its obligations on the use of Māori data in an AI career path recommendation application. It acknowledges that different approaches are required for the data used to train the application and the data obtained from those making use of the application. It demonstrated that different types of data used by the application have the potential for different levels of mana, and highlighted the potentially challenging point that, for certain types of data, iwi must have the final say on how that data is used.

Two recurring themes throughout this article are that iwi must be engaged early and in an effective manner, and that recognising principles of Māori data sovereignty will require a level of investment. If these approaches are adopted, it will be possible to build an AI career path recommendation application that adopts the principles of Māori data sovereignty, and, in doing so, meet the institution's objective of assisting all students — Māori and non-Māori — in identifying courses of study in which they are most likely to succeed.