



**FOR THE PROFESSIONAL DOCTORAL DEGREE IN
INDIGENOUS DEVELOPMENT AND ADVANCEMENT**

BY

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**LEVERAGING THE POWER OF MATAURANGA-A-HAPŪ IN
NEGOTIATING INTERNATIONAL TRADE: BEING BOTH
TRANSFORMATIVE AND LIBERATING.**

2020

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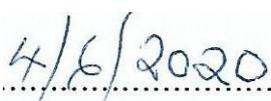
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ABSTRACT

By 2016, four Māori corporations had surpassed the billion-dollar threshold in assets. The primary trading partner being the People's Republic of China who Dr Pita Sharples in 2012 acknowledged as having Māori blood ties. Moreover, Sharples postulated that Confucian Philosophy alongside Mātauranga Māori gave a moral and philosophical compass to base trade relations. During an IT secondment to a Confucian philosophy-based corporation I developed algorithmic and transcultural models based on the two bedrock philosophies. Disquietingly, this business research revealed two subsocieties within a society. One that created employment opportunities through export giving prosperity to its membership. Whereas, based on peer-reviewed research, another subsociety perceived as being insular and with some anti-trade rhetoric. Those differences were stark. As no Sino-Māori research had been published, contextual data from the corporate and central government reports that were published, was used for the literature review purposes. This project focuses on crafting and tweaking, the export decision-making calculus for it involves three languages, two bedrock philosophies, tikanga Māori validated best business practices, international law and the shareholder expectations to render an equitable decision, one hundred percent of the time. The researched corporations acknowledged a richness in data but lacking in the information creation capacity in which to make speedy and informed decisions, on a 24/7 basis. Connecting the Māori worldview to today's international business communities required the creation of the HMMead_Algorithm© establishing Tikanga Māori compliant Algorithms, Artificial Intelligence (AI) and Artificial Neural networking (ANN) technologies. The research tangible deliverable is an Expert System (a branch of Artificial Intelligence) named He Pātai®. Within its internal code is computer logic driven by Interpretative Argumentation

Theory that produces the sustainable, equitable decision – the nub of this professional doctorate research effort.

Keywords: *Confucian philosophy, mātauranga māori, hmmead_algorithm© interpretative argumentation theory, sustainable, equitable decisions.*

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Glossary of Māori Terms

This glossary represents the translations of Māori to English sourced from various Māori to English dictionaries as well as the mita or dialect of my own hapū of Ngāti-te Ao ki te Rarawa from the Tai Tokerau in the North of Aotearoa New Zealand.

<p>A model marae Trust Society</p>	<p>Objectives: to encourage whānau and hapū to principles of mana tangata, mana whenua, manaaki tangata tikanga-a-marae. Promote cultural, social and economic development. Kaitiaki building infrastructure to the highest standards Manuhiri received according to tikanga-a-whānau Whakawhanaungatanga other hapū, marae and iwi. The reserve be administered by the Ture Whenua Māori Act 1993.</p>
<p>Ahi kā</p>	<p>Those who have the right to occupy the land.</p>
<p>Āhuatanga</p>	<p>characteristics guidelines, creativity; entrepreneurship; problem solving.</p>
<p>Aotearoa</p>	<p>Māori name for New Zealand; literally “land of long white cloud.”</p>
<p>Aroha</p>	<p>Love, compassion, empathy, caring for others.</p>
<p>hapū</p>	<p>To be pregnant, conceived in the womb or the relationship of the wider family. A sub-tribe.</p>
<p>He tohu tūhonotanga</p>	<p>Reaching out, a token of goodwill towards building relationships then possible trading partnerships. (The objective of this thesis).</p>

Hui	The gathering, meeting, assembly, seminar or conference.
Hui taumata	Māori economic development meeting
Iwi	The extended kinship group, tribe, nation, people, nationality, race - often referring to a large group of people descended from a common ancestor.
Kāhui kaumātua	Loosely described as an Elders Board who represent the marae interests to the iwi or hapū leadership. It has a quorum. Its role is to be persuasive and a point of deference and has the powers (based on whakapapa) to delegate tikanga where none exists. It may also override non-Māori structures. It should also counterbalance influences. In case law, the Aotearoa New Zealand Courts refer tikanga-based litigants to this body for resolution. It may also serve as an appeal mechanism.
Kaitiaki	A trustee, minder, guard, custodian, guardian, keeper.
kaitiakitanga	Protection, taking care.
Kaumātua	Elder male.
kaupapa	Agenda, topic, protocol, guiding principle, strategy.
Kaupapa Maori	Māori centric methodologies, themes, or strategies.

Karakia	Chants recited rapidly using traditional language, symbols and structures. Karakia were not used to worship or venerate gods. prayer. ‘a formula of words which was chanted to obtain benefit or avert trouble.
Kawa	Protocol – customs of the marae and whare nui.
Kawanga Whare	<p>Noun: Briefly, a house-opening ceremony – the formal pre-dawn ceremony to open a new building, especially a meeting house. Because the newly carved house has been made of timber from the forests of the atua, Tāne-mahuta, and because there are carved figures of ancestors around the walls of the meeting house, the tapu on the house has to be lifted so that the building can be used by everybody. The tohunga recites karakia outside the building and the building is named. There are three karakia used, the first about <i>Rātā</i>, an early ancestor who was a carver and builder of canoes, and the birds of the forest which have to be appeased.</p> <p>The second karakia is to lift the <i>tapu</i> from the building and the tools used, and the third is an appeal to the <i>atua</i> to make the house stable and firm, to avert accidents and to</p>

	make it a pleasant dwelling place.
Kōhanga Reo	Māori language preschool, was the nesting place for children.
Kōrero	To tell, say, speak, read, talk or address.
Kuia	Elder female.
Kura kaupapa Māori	Māori-language immersion schools where philosophy and practice reflect Māori cultural values with the aim of revitalizing Māori language, knowledge and culture.
Mahakī	Humble.
Mana	Power, authority and rights
manākitanga	Care for, entertain, show, respect, hospitality.
Mana motuhake	(noun) separate identity, autonomy, self-government, self-determination, independence, sovereignty, authority – mana through self-determination and control over one’s own destiny.
Māori	The Indigenous people of New Zealand.
Māoritanga	Power, authority and rights.
Marae	The open area in front of the whareniui, where formal greetings and discussions take place. Often also used to include the complex of buildings around the marae.
Matariki	Matariki the Maori New Year is rich with tradition. Discover the importance of Matariki and explore ways that you can celebrate the Maori New Year with your

	<p>family. The next Matariki is schedule for 10 June 2019.</p> <p>What is Matariki the Maori New Year?</p> <p>Matariki is the Maori name for a group of seven stars known as the Pleiades star cluster.</p> <p>Some people think of Matariki as a mother star with six daughters, and it is often referred to as the Seven Sisters.</p> <p>Others think that Matariki are the ‘eyes of the god’. When out his eyes and hurling them into the heavens.</p> <p>Matariki appears in the eastern sky sometime around the shortest day of the year and is thought to determine how successful the harvest crop will be in the coming season. The brighter the stars, the more productive the crop will be.</p> <p>What does Matariki mean?</p> <p>Matariki has two meanings, both of which refer to the cluster of stars. It also means Tiny Eyes, and Mata Ariki means Eyes of God.</p>
<p>Mātauranga Māori</p>	<p>Māori knowledge - the body of knowledge originating from Māori ancestors, including the Māori world view and perspectives, Māori creativity and cultural practices.</p>
<p>Mauri</p>	<p>(noun) life principle, life force, vital essence, special nature, a material symbol of a life principle. Also used for a physical object, individual, ecosystem or social group in which this essence is located. A hidden</p>

	principle protecting vitality. Retrieved from Maoridictionary.co.nz
Mihi whakatau	A less formal ritual of encounter; welcome.
Pā	Māori fortress.
Pākehā	New Zealander of European descent.
Pepeha	Proverb, boast, witticism or motto.
Pōwhiri	Welcome, invitation, opening ceremony.
Pūtake	The origin or reason for being. Every business has a reason for being. Many Māori businesses exist for the same reason as other businesses; that is, they are there to provide goods or services at a profit and to enrich the business owners.
Rohe	territory or boundary of tribal groups.
Tangata whenua	Local people, aborigine, native.
Tangihangā	Mourning, weeping, crying, funeral, rites for the dead, obsequies – one of the most important institutions in Māori society, with strong cultural imperatives and protocols. Most tangihanga are held on the marae.
Tapu	Sacred, forbidden, confidential, taboo.
Tauīwi	Foreign race – sometimes used to refer to Pākehā.
Tautoko	To support, prop up, verify, advocate, accept.

	(an invitation), agree.
Te ao	The world; worldview.
Te ao Māori	Māori worldview.
Te reo Māori	The Native language to New Zealand.
Tika	<p>Described as a norm, (something that is usual, typical or standard) rather than a cod systematic code of laws and rules that keeps order in a Māori customary society. It is prescriptive of human conduct as well as being as normative and has identifiable characteristics. Also described as customs, practices, protocols and values.</p> <p>A respected kaumātua has suggested that it may be created organically where the norm does not exist. Today, it must be ratified by the Kāhui Kaumātua and tabled in the form of ‘minutes.’ In the introduction of commercial or business terms within the iwi lexicon the concept of ‘Organic tikanga’ will assist governance / executive in their decision-making processes. The introduction of commercial or business terminology to the iwi lexicon particularly in commercial sensitivity sees the need for tika being codified in order for non-Māori to be aware.</p>

Tikanga	The custom, obligations and conditions, correct procedure, custom, habit, lore, method, manner, rule, way, code, meaning, plan, practice, convention, protocol – the customary system of values and practices that have developed over time and are deeply embedded in social context.
Tino rangatiratanga	Self-determination, sovereignty, autonomy, self-government, domination, rule, control, power.
Tiriti o Waitangi, specifically Article 2.	<p>The following is Article 2 of the Treaty of Waitangi. Ko te tuarua. Ko te Kuini o Ingarani ka whakarite ka wakaae ki nga Rangatira ki nga hapū – ki nga tangata katoa o Nu Tirani te rino rangatiratanga o o ratou wenua o rato kainga me o ratu taonga katoa. Otiia ko nga Rangatira o te wakaminenga me nga Rangatira katoa atu ka tuku ki te Kuini te hokonga o era wahi wenua e pai ai te tangata nona te wenua – ki te ritenga o te utu e wakaritea ai e ratou ko te kai hoko e meatia nei e te Kuini he kai hoko mona.</p> <p>Article 2 translated to English: “Confirmed and guaranteed to the chiefs’ exclusive and undisturbed possession of their lands and estates.”</p> <p>NB: Accepted by Māori, as a Treaty Partner, to be the authority to negotiate international trade agreements in conjunction with the relevant Aotearoa New Zealand legislation that affords protections. Moreover, the</p>

	treaty relationship assumes access to dispute resolutions mechanisms within the World Trade Organisation (WTO).
Tohunga	Skilled person, chosen expert, priest person chosen by the agent of the atua and the tribe as a leader in a particular field because of signs indicating talent for a particular vocation.
Tūrangawaewae	The place to stand or position, situation, site, foundation and soak or steep in water.
Wāhine	Female, women, feminine.
Waiata	A song. There are various forms of waiata, such as songs of love and revenge.
Wairua	Spirit, soul, quintessence-spirit of a person which exists beyond death.
Whaikōrero	Formal speeches usually made by men during a pōwhiri and other gathering.
Whakapapa	A family tree and the connection of being part of mother earth.
Whakatauki	A proverb or saying where the author is known.
Whakatauaki	A proverb or saying where the author is <u>not</u> known.
Whānau	The extended family, family group or familiar term of address to a number of people, sometimes used to include outsiders.
Whānaungatanga	The relationship, kinship, sense of family connection-a relationship through shared

	experiences and working together which provides people with a sense of belonging.
Whare wānanga	University, place of higher learning- traditionally, places where tohunga taught the sons of rangatira their people's knowledge of history, genealogy and religious practices.
Whatukura	A man of noble stature.
Whenua	Country, land, nation or the placenta, afterbirth.

Glossary of Mandarin Chinese Terms

(Note: Throughout this thesis there are terms derived from Confucianism that are expressed in Traditional and Simplified Chinese characters followed by the Hanyu Pinyin as the official romanization system of standard Chinese in the People's Republic of China (PRC). The International Organization for Standardization (ISO) adopted the standard in 1982. Where MS Word 2016© cannot be used to represent the original texts, as in ancient calligraphy, a snapshot will be taken using MS PowerPoint© and pasted onto the thesis page. Additionally, as the thesis content makes reference to the SINIC (derived from Medieval Latin Sinicus from Sina "China") a grouping of countries that include the PRC, Korea, Japan, Vietnam, and Singapore, care has been exercised to ensure that clarity, not available to all versions of this editing software character set (Hanzi and Kanji: differences in the Chinese and Japanese character sets today). So, at times, different fonts will be used. This background knowledge was gained from 35 years IT/IS experience as a Systems Engineer, some of which was in Taiwan.

(This following list was retrieved from <http://www.confucius-1.com> expressed in English, Simplified Chinese (简化字; jiǎnhuàzì) used in the PRC and Singapore. The second grouping in Traditional Chinese, a standardized character set used in Taiwan, Hongkong and Macau. The third component is Hànyǔ Pinyin romanization based on the pronunciation of Putonghua or Mandarin using the 23 initials in the Latin alphabet. A superscripted numeric may at times be used to depict tone such as Lǐ³ in the Confucian virtue of Lǐ.)

<p>Chinese New Year</p>	<p>is usually known as the Spring Festival in modern China. An important Chinese festival as the turn of the traditional lunisolar Chinese calendar. It is one of several lunar New Years in Asia. Celebrations traditionally run from the evening preceding the first day to the Lantern Festival on the 15th day of the Calendar month. The first day of the New Year falls on the new moon between January 21 and February 20. In the 2018 the first day of the Lunar New Year was on Friday 16th February, initiating the Year of the Dog. It is one of the world's most prominent and celebrated festivals and involves the largest annual mass human migration in the world. It is a major holiday in Greater China and has strongly influenced the lunar new year celebrations of China's neighbouring cultures including the Korean New Year (seol), the Tết of Vietnam, and the Losar of Tibet. It is also celebrated world-wide in countries with significant overseas Chinese populations including Singapore, Indonesia, Malaysia, Thailand, Cambodia, Australia, the Philippines, and Mauritius.</p> <p>The New Year festival is centuries old and associated with several myths and customs. Traditionally, the festival was a time to honour deities as well as ancestors. Within China, regional customs and traditions concerning the celebration of the Lunar New Year vary widely. Often, the evening preceding Lunar New Year's Day is an occasion for Chinese families to gather</p>
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	<p>for the annual reunion dinner. It is also traditional for every family to thoroughly clean the house, in order to sweep away any ill-fortune and to make way for incoming good luck.</p> <p>Windows and doors are decorated with red colour paper-cuts and couplets with popular themes of "good fortune" or "happiness", "wealth", and "longevity". Other activities include lighting firecrackers and giving money in red paper envelopes.</p> <p>In about one third of the Mainland population, or 500 million Northerners, dumplings (especially those of vegetarian fillings) feature prominently in the meals celebrating the festival.</p>
Filial piety	<p>Confucian Philosophy (Chinese: xiào) is a virtue of respect for one's parents, elders, and ancestors. The Confucian classic Xiao Jing or Classic of Xiào, thought to be written around the Qin-Han period, has historically been the authoritative source on the Confucian tenet of xiào/" filial piety."</p>
Guanxi (Chinese: 关系) or Guanshi	<p>describes the basic dynamic in personalized networks of influence (which can be best described as the relationships individuals cultivate with other individuals) and is a central idea in Chinese society.</p>
Li ³ (simplified Chinese: 礼; traditional Chinese: 禮; Pinyin: <i>lǐ</i>)	<p>is a classical Chinese word which is commonly used in Chinese philosophy, particularly within Confucianism. <i>Li</i> does not encompass a definitive object but rather a somewhat abstract idea and, as such, is translated in a number of different ways. Wing-tsit Chan explains that <i>li</i> originally meant "a religious sacrifice but has come to mean ceremony, ritual, decorum, rules of propriety, good form, good custom, etc., and has even been equated with Natural Law."</p>
Mianzi 面子	<p>The closest meaning in English would be 'to save face'. The Chinese idioms would be "Men can't live without face, trees can't live without bark."//ren hou lian, shu hou pi//. Another is, "A family's ugliness (misfortune) should never be publicly be aired</p>

	// jai chou b uke wai yang//. Another means to “grant face: give (someone) a chance to regain lost honour. To show respect (for someone’s feeling.”)
Ren (Chinese: 仁; Pinyin: rén; Wade–Giles: jen)	Confucian virtue denoting the good feeling, a virtuous human experience when being altruistic. Ren is exemplified by a normal adult's protective feelings for children. It is considered the outward expression of Confucian ideals.
Xin: Chinese 信; Pinyin: xìn).	A concept for “disposition or feelings”. Cultivated during one’s life. Considers emotion and reason as coextensive as much as cognitive as emotional. (My note: sometimes sketched as a ‘heart’.)
Lunyu or Analects	Confucius’ teachings and conversations with his followers. A collection formed during the second century BCE
Yi	literally justice and righteousness; meaning is an important concept in Confucianism. It involves a moral disposition to do good and also the intuition and sensibility to do so competently. (Note: This Confucian virtue Yi is not fully expressed here using the simplified, traditional or Jyutping Ji6 (Cantonese translation developed in Hongkong) Zhuyin Fuhao character for this is dependent on the Microsoft© JhengHei font being available post-Windows Release 8.1.
Qingming Festival or Ching Ming	Festival, also known as Tomb-Sweeping Day in English sometimes also called Chinese Memorial Day or Ancestors’ Day or Pure Brightness , is a traditional Chinese festival. It officially starts 104 days after the winter solstice. The festival usually begins on April 4th or 5th, but activities may start as early as 10 days prior. It has been observed by the Chinese for over 2,500 years. It became a public holiday in mainland China in 2008. In Taiwan, the public holiday was in the past always observed on 5 April to honor the death of Chiang Kai-shek (who ruled Taiwan securely as its first President until May 20, 1948.) In the PRC the holiday is associated with the consumption of

	<p><i>qingtuan</i>, green dumplings made of glutinous rice and Chinese mugwort or barley grass. A similar confection called <i>caozaiguo</i> or shuchuguo made with Jersey cudweed (<i>Pseudognaphalium luteoalbum</i>) a thick woolly on both leaf surfaces and has many basal stems, each with many narrow leaves. It is a native to New Zealand and is found in many countries and occurs in lawns and gardens throughout this country and is consumed in Taiwan.</p>
<p>Neo-Confucianism</p>	<p>Name commonly applied to the revival of the various strands of Confucian philosophy and political culture that began in the middle of the 9th century and reached new levels of intellectual and social creativity in the 11th century, in the Northern Song Dynasty. The first phase of the revival of the Confucian tradition was completed by the great philosopher Zhu Xi (1130-1200) and became the benchmark for all future Confucian intellectual discourse and social theory. After the Song Dynasty (960-1279 Common Era), the Neo-Confucian movement included speculative philosophers, painters, poets, doctors, social ethicists, political theorists, historians, local reformers and government civil servants. By the 14th Century Zhu's version of Confucian thought, known as <i>daoxue</i> or the teaching of the way or <i>lixue</i> or the teaching of principle, became the standard curriculum for the imperial civil service examination system. The Neo-Confucian dominance of the civil service continued until the whole system was abolished in 1905. (This description was retrieved from www.ep.utm.edu/neo-conf/ - A Peer-Reviewed Academic Resource)</p>

Glossary of Information Technology and Science terms

This glossary represents the terms of the industry from various world-wide sources. While the Institute of Electrical and Electronic Engineers (IEEE) standards will be adhered to, other

national or academic sources will also be utilised and represented in the context of its author or publisher. Conformity to IEEE standards enables compatibility with partner IT/IS systems and portability for prospective software sales by a registered hapū owner.

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<p>Algorithm and Application and Programming Interface (API).</p> <p>AI GUI (Graphic User Interface.)</p>	<p>A process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer</p> <p>Algorithm are not patentable in the US. In <i>Gottschalk v. Benson</i>, 409 U.S. 63 (1972), the United States Supreme Court case, the Court found that a process claim directed to a numerical algorithm was not patentable because “the patent would wholly pre-empt the mathematical formula and in practical effect would be a patent on the algorithm itself.” The case was argued on October 16, 1972 and decided November 20, 1972. Retrieved from https://supreme.justia.com/cases/federal/us/409/63/.</p> <p>The API is a tool in a software library that allows a computer programmer to access common routines rather than write new code. Commonly found in Open Source libraries where others have sold or donated their works. An example for this project is subscribing or leasing the Google Translate© function to translate He Patai© responses from English to Māori and vice versa.</p> <p>About AI GUI. This tool enables automated testing. It is a basic functionality tool to navigate software and verify</p>
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	<p>elements. It will tackle object recognition and can identify what should be tested or prioritised based on a previous test history or risks that are ranked by how critical they are, their complexity and performance.</p>
<p>Argumentation theory (Interpretative)</p>	<p>Is the interdisciplinary study of how conclusions can be reached through logical reasoning; that is, claims based, soundly or not, on premises. It includes the arts and sciences of civil debate, dialogue, conversation and persuasion. Epistemically, warrants may be backed <i>a priori</i> or <i>posteriori</i>. The interpretative is a dialogical process to explore and/or resolve interpretations. In this context, a Sino-Māori partner may for example question in a tikanga Māori component say, like the rāhui for dates-in-effect or their physical location. Tikanga Māori has variance within some hapū such as kawa or protocols. Using ANN, He Pātai® will present the hapū logic to ensure no ambiguity and at the same time, retain (store in memory) the dialogue for reasoning within posteriori (from the past) or use for later reasoning should the executive make further queries.</p>
<p>Artificial Neural Networks (ANN)</p>	<p>The goal is to solve problems in the same way that a human brain would. However, over time, attention has moved to performing specific tasks, leading to deviations from biology. Used for a variety of tasks including activities that have traditionally been considered as reserved to humans. In this cross-bedrock application, He Pātai® uses high-level representation using successive layers of variables to model each layer. 99% of its tasks are Rules-based with Inference processing. The remaining 1% is used by ANN in the Tacit Information processing.</p>

<p>Artificial Intelligence</p>	<p>Sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals. Colloquially, the term “artificial intelligence” is applied when a machine mimics “cognitive” functions that human associate with other human minds, such as “learning” and “problem solving”. The science was founded on the claim that human intelligence “can be so precisely described that a machine can be made to simulate it”. In Alan Turing’s “polite convention” – We need not decide if a machine can “think”; we need only decide if a machine can act as intelligently as a human being. This approach to the philosophical problems associated with AI forms the basis of the Turing test. NB: The ‘standard interpretation’ of the Turing test, in which player C, the interrogator, is given the task of trying to determine which player – A or B – is a computer and which is a human. The interrogator is limited to using the responses to written questions to make the determination.</p>
<p>Equitable Decision</p>	<p>Derived from Argumentation theory to create ‘sustainable equitable decisions being the core reason for this thesis. Contains rules, legal texts and the reasoning applied to the facts in a situation to be processed by AI. It is triggered by the ‘What if?’ query entry.</p> <p>A term that defines as impartial or reasonable, fair or just, after all impediments and encumbrances are considered.</p> <p>In entering binding international trade agreements, Māori exporters assume new responsibilities involving cross-cultural sensitivities, ritual protocols and the creation or ‘piggybacking’ of international dispute resolution.</p> <p>This burden balances Tikanga Māori alongside Aotearoa New Zealand Legislation, International Trade Pacts (such</p>

	<p>as the New Zealand China Free Trade Agreement of 2008), any hapū-centric Tiriti o Waitangi settlement legislation. Of equal importance as Tikanga is the bedrock philosophy the trading partner such as Confucian Philosophy.</p> <p>On the business of doing business internationally this research also drilled down into over 135 international business principles covered by my international MBA. Two are mentioned here: Return on Investments (ROI) and Equity. Each was tested against Tikanga Māori principles to validate their ordinary and Tikanga meaning to determine any breach. The results were collated in an AI dictionary (part of He Pātai®). Breaches were given a data point ‘weighting factor’ of 0-5. 0 = Ok with an incremental degree of severity. Example of the use would be that 1 is a warning message such as “Rahui in effect” and 5 being a breach of the Tikanga Māori principle such as kaitiakitanga or guardianship = water rights.</p> <p>A decision matrix using qualitative techniques was constructed to include all datapoints described above.</p> <p>When the CEO or Operations Research Officer uses the “What if?” query entry, AI would test it with the database created by knowledge from its human resources.</p> <p>An example could be the hapū Fisheries Manager in Ōtautahi communicating interactively stock orders with known client’s AI systems in China. (While the human resources needed to hold all the above data was conservatively scoped to be at least 10 to 25 decision makers present at</p>
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each meeting, there was still no guarantee of an ‘equitable decision’ being made.)

This AI service would be available 24/7 and responses to the most complex issues in nanoseconds.

To test the integrity of the AI generated ‘equitable decision making’ requires regression (described elsewhere in this glossary). It outlines the process to verify and produce that consistent ‘equitable decision’ for a given situation. Another way to comically describe regression is to take the same ‘idea’ and ‘run it by’ five teams of the experts described above. As humans, we will take the mean, as being the average of the number of groups as close enough. THIS IS NOT GOOD ENOUGH. This is careless and could offend our client and indeed ourselves – not Tikanga Māori. Hence the decision to use AI and this researcher has that capacity.

The AI internal processes: AI operates a Graphic User Interface (illustrated in Figure 16) that allows the CEO or Operations Research to interact with AI using graphical icons or primary notations.

Level one. Tikanga Māori: AI firstly identifies the relevant tikanga argument while the second applies the tikanga to the facts. e.g. the hapū corporations seeks a substantial infusion of capital/cash/equity/shares to expand its factory to meet its delivery needs. Tikanga (Mead, 2003) principles support the transaction however, AI will also interrogate business principles using tikanga, for compliance. AI may proffer advice and/or check for a rāhui status. Thence to,

	<p>Level two: <u>Confucian Philosophy</u>: while the path is identical to level one, Low (2012) ‘exceptions’ will be applied to data validated at level one. Any errors will be returned to the CEO or OR. Then to,</p> <p>Level three: <u>Hapū centric / national legislation</u> an or hapū data such as whakapapa. Could be shareholder data i.e. Koroua / Kuia beneficiary list.</p> <p>Level four: Information or data list. If processing was successful, all new records will be held for a specified time to enable follow-up queries. The information/data lists will be formatted in a GUI presentation.</p> <p>(FYI He Pātai® AI Systems limited has created this AI system of which the first panel is illustrated at Figure 16.)</p>
Expert System	<p>A piece of software which uses databases of expert knowledge to offer advice or make decisions in such areas as medical diagnosis, legal decision-making or business support. Makes extensive use of artificial intelligence (AI) techniques. Use of AI in management information systems have a long history – indeed, terms such as Knowledge-based systems and Intelligent systems have been used since the early 1980’s to describe components of management systems, but the term “Intelligent decision support systems” is thought to originate with Clyde Holsapple and Andrew Whinston in the late 1970’s while emulating human capabilities as closely as possible. Retrieved from http://dssresources.com/history/dsshhistory.htm</p>

Inference Engine	In the field of Artificial Intelligence and Intelligent Decision Support Systems, inference engine is a component of the system that applies logical rules to the knowledge base.
Knowledge Base	A software part that allows non-programmers to add or change business logic in a business process management (BPM) system. A business rule is a statement that describes a business policy or procedure.
Norm	Standard of proper or acceptable behaviour: an average level of development or achievement: something (such as a behaviour or way of doing something) that is usual or expected. Source: Merriam-Webster Dictionary.
Ontologies (Their roles in Information Systems and Artificial Intelligence)	These fall into two broad categories: <i>mechanism</i> theories and <i>content</i> theories. Each represents objects, properties of the objects and relations between objects that are possible in a specified domain of knowledge. They provide terms for describing our knowledge about the domain.
OODA Loop	Making executive decision requires several steps. This filter is part of the Observe, Orient, Decide and Act loop devised by John Boyd (Osinga, 2006).
Parametrically Driven	The drivers of inquiry may be initiated by a simple entry or entries concatenated simulating interactive entries initiating multiple requests to be manipulated by artificial intelligence to address “What_IF” scenarios. A common feature on Expert Systems.
Regression	Regression analysis is widely used for prediction and forecasting, where its use has substantial

	<p>overlap with the field of machine learning. Regression analysis is also used to understand which among the independent variables are related to the dependent variable, and to explore the forms of these relationships.</p>
<p>The HMMead_Algorithm©</p>	<p>Based on Mead (2003) as the source and thesis standard for defining the principle of tikanga Māori. It is a process or set of rules to be followed in calculations or problem-solving operations especially by a computer. Tikanga in this context is described as a norm, in being prescriptive rather than proscriptive. There were perceived wide inconsistencies through lack of scholarship, in some cases, constraints imposed by external influences. There was amongst non te reo speakers' misunderstandings in the meaning of tikanga. Erudite leadership states tikanga must be conducted only in te reo Māori. The Ngati-te-Ao hapū has stated its tikanga be a coherent set of rules based on the knowledge handed down through the generations and only expressed in te mita-a-hapū. This content is populated alongside cross-cultural, legal, and geographic semantics to form the bedrock of the hapū Expert System called He Pātai©.</p>

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PERSONAL POSITIONING

Five careers over fifty years on four continents translated into exciting challenges with commensurate reward. There were downsides; moving disrupted the kids' friendships. The benefits though were living in foreign capitals so different to the whānau home that was (and still is), without a corner store, or indeed, a corner! For Pukepoto, at the top of Aotearoa New Zealand was all-Māori and a safe place. Our school, named the Pukepoto Native School where teachers stressed the acquisition of literacy and numeracy skills that made the English language tops, with numbers and sums coming a close second. Social Studies fostered the desire to seek out foreign cultures. There was a sprinkling of Pākehā (non-Māori) students at our 'Native' school, from nearby Kaitaia. Their father, a physician, brought them daily; that had to be a positive, for he, a learned person had surely done due diligence before committing progeny to our environment. Their presence helped us immensely in the daily language practice; something lacking in our homes. Other Pākehā kids came from the colonisers. My questioning the material disparity between 'them' and 'us' incurred the wrath of some. Much later in life at first-year Law, the words *raupatu* and *contra proferentum* helped me understand that disparity, and their 'acquisition' of the better productive land at higher ground while ours were subject to flooding each winter. To question the "why" labeled me the "troubled one". Those differences were repugnant: yet no resolution was in sight. I got 'it' from both sides: the 'settlers', and my own community — for Christianity had become a cornerstone for Māori. There were no Pākehā churches around, but we had two: funny that. The important questions were: did affluence immunise Pākehā from Riha and Kutu? Probably not. How about tāpā? A definite yes.

English-only at school with the patience of the elder husband-wife school masters

in Mr Clifford and Mrs. Hawkes helped us to gain that confidence in the English language from an early age to seek out in later life, professional careers. That complemented Mum's *te reo* only policy in the home; a privilege really, that would create the basis for an international career with the multi-national corporation. A stickler for homework, she enjoyed listening to us reading English out aloud. Also, a 'student of the world', she expected translations to *te reo* Māori of the New Zealand Broadcasting Service six-pm radio news bulletin.

Cream from our twenty hand-milked Jersey cows went to the butter factory; skim milk fattened the six pigs bound for the abattoir for the much-needed cash to buy fertiliser and stock food. The vegetable garden and fruit for pickles, preserves and jams stocked the larder. The neighbours were also grateful. Our protector worked hard despite being born with the condition known as Kyphosis; tiring easily. An inspiration to us three.

Mei, our mum was a spinster. Lena, my birth mother, Mei's niece, loved me but could not afford the care. My father was from the North-East of the United States serving in the Second US Marine Division shipped out to something called WW2 in the South Pacific. By legal writ, Lena became my cousin; Mei became 'Mum'. I was left a small amount of cash and a shoe box full of military memorabilia.

Mum instilled community values very early for on the last Saturday per month with kids in tow dragging a sack of cleaners and gardening tools, we climbed that hill to prepare the church for Holy Communion. The family burial plots got a tidy up as well. That barbed wire fence separated *tūpuna* at the *urupā*: Anglicans / Episcopalians to the left, the Morehu or followers of T.W. Ratana (25 January 1873 – 1939), a Māori prophet who espoused Christianity, were buried to the right. My *tupuna* born as *whānau* were separated on their passing based on the colonialist Bible. Didn't quite make sense to me.

Army service in Borneo during ‘Konfrontasi’ with Malaysia (where 75% of us in the Special Air Service (SAS) were Māori) taught three valuable lessons: the importance of completing a project (passing the selection course); setting of priorities (through ‘gears’ before ‘beers’); and, doing the ‘small things right’ (making those square bed-rolls 100%, or else.)

A job in Signals Intelligence (SIGINT) within the Defence Department for eight years took the family to live in Singapore. Learning a new foreign language was part of the job description.

Computer programming education in the 1970’s was still in its infancy with US based polytechnics offering classes extramurally, but at a cost. I needed to get out of the spying business because the shift work was killing me. Luckily there was plenty of ‘down’ time during the night shifts, so valuable study was done. Five years later, with a family of four and a diploma in hand, came separation from government employment dropping two thirds in salary to take an entry-level computer programmer position with Air New Zealand. Luckily Ruth whose well-known creative skills in making clothes and keeping us fit and healthy stepped in, resuming her nursing career with great sacrifice working permanent night shift. Her resourcefulness was unparalleled. Times for us all were challenging but that ‘shoe box’ was still foremost in my mind. Learning continued in the USA: an undergraduate degree in Computer Science followed by an MBA enhanced career prospects in Canada, the United States of America, Colombia, France (twice), Australia, Germany, and The Republic of China in Taiwan.

My family enjoyed Paris, including Handel’s Messiah (I think), then the John. F. Kennedy Center for the Performing Arts in Washington, D.C., for the same Christmastide performance.

Retirement brought opportunities in tribal leadership with First Nations of Canada.

To answer the “so what?” question, this research sought through critical qualitative research forms of inquiry and practices, using frames of reality, to seek to improve Māori corporate Key Performance Indicators as well.

What whet my appetite for this research? It was the opportunity to utilise senior management and technical skills from an executive career spanning thirty-five years in both North America and Europe to support whānau, marae, hapū and the iwi commercial enterprises.

Law school taught legal theory, philosophy, statutory interpretation, legal frameworks and structures, Constitution, Public Law, as well as Treaty law. Mooting I found enjoyable. I formally upskilled te reo and tikanga Māori in 2011 graduating from the *Te Pūtaketanga o Te Reo* program at Te Wānanga o Aotearoa, the 2nd largest tertiary education provider in the country. They offered a comprehensive range of certificate to degree level qualifications. During that time, there was participation as an observer at iwi related meetings in Kirikiriroa, Tauranga Moana and Waitangi. Their leaders spoke so eloquently bringing their rich and delicate fabric forward from their rohe especially at Waitangi on February 6th and *te koroneihana*, the highlight of the Māori calendar and celebrated annually at Turangawaewae Marae near Kirikiriroa Hamilton in the province of the Waikato. That developed the curiosity to explore how my tupuna who were successful as international entrepreneurs. An inquiry into a course of study in advanced research combined with professionalism and reputation brought me to this institution. Their support was excellent throughout this research project.

Thus, the knowledge presented in this professional doctorate thesis is the combination of research findings of other people’s scholarship and, personal knowledge of the application of sound business principles while in the employment of some of world’s leading corporations over the last seventy-five years

CHAPTER ONE – Introduction



Figure 1. He kai kei aku ringa

(There is food at the end of my hands) Graphic courtesy New Zealand Trade & Enterprise. NZTE)

This overarching goal of this research thesis is creating measurable deliverables: a permanent repository of mātauranga-a-hapū including cross-cultural elements necessary to promote a flourishing trade and, the AI tool supporting Māori export executives and governance in addition to the Operational Research support team.

The two goals in support of that overarching goal are:

- The creation of the Sino-Māori cross-cultural knowledge base of concepts, elements, terms and activities that contribute to the stated goal of delivering sustainable, equitable decisions.
- Development and implementation of an AI architecture (He Patai® delivering that goal

Before launching into the minutiae describing the subject matter, workflow, and co-dependencies, there first is a need to understand the motivation for undertaking a

Professional Doctorate (PD) in the first instance, rather than the Doctor of Philosophy (PhD). The PHD is normally viewed as a research-only programme whereas the PD contributes to my Information Technology (IT) / Information Sciences (IS) profession through the designing, creating and implementation of tangible deliverables such as AI.

The Professional Doctorate versus Doctor of Philosophy in Business.

The PD according to Lester (2004) stands for an ongoing dialogue between me (researcher) and the Sino-Māori trading hapū (client), the beneficiary, and the Academy. This research choice was offered and accepted at enrolment for it met the disciplinary requirements and was the best vehicle for research of this kaupapa. There was familiarity with its structure after thirty-five years engaged in the Information Technology & Sciences. The research brief from hapū included creating a small business, developing cross-cultural enterprises, restructuring existing corporates to meet new opportunities, developing cutting-edge management tools and, the resolution of existing “known” problems to providing the legal mechanisms for problem avoidance.

The research structured workflow cascaded through dependencies that culminated in the deliverables. The disciplines engaged were Information Technology and Information Sciences, cross-cultural social entrepreneurship, quasi-legal, and those attributes for small-business ownership. All focused-on wealth creation for the client, my hapū. No economic base existed for them hence the need to deliver a workable economic platform from scratch. Then to create the infrastructure and supporting elements to move their goods and services through to the export markets.

Unfortunately, while hapū saw in the early wānanga the merits of creating small whānau and marae businesses, its demographic of 65 to 90 years of age could not support entry-level enterprise creation. Their difficulties lay in securing business financing due to the multiple ownership of Māori land that precludes its use as collateral by the banks. That idea was abandoned. So, then the focus became supporting the hapū based, export enterprises spread throughout Aotearoa New Zealand.

A hybridised conceptual framework espoused by Uz (2014) that meets cross-cultural trade specifications was based on three principles: modernity, capitalism and scientific rationalism. Add to that, the underlying philosophies being Kaupapa Māori, Tikanga Māori with Confucianism. The so-called glue that ties them together are the Ontologies for, and of, the Information Sciences, plus Māori. They will cohabitate to meet the specifications for an Expert System, hereafter referred to as “ES,” and Artificial Intelligence hereafter referred to as “AI,” to produce the tools guaranteeing compliance to the underlying philosophies.

This research project is an ongoing triangulation that forms a partnership who agree to cooperate to advance their mutual interests. Legally a partnership is also a voluntary contract between two or more competent persons to place labour and skill, or some or all of them with the understanding that there shall be a proportional sharing of the profits and losses between them. Generally, a contract has 4 elements: an offer, an acceptance, an intention to create a legal relationship and, a consideration (usually money).

My vocation began at the shop floor level and progressed incrementally but steadily through continued work experiences complemented with formal learning to the completion of the graduate degree of Master of Business Administration (MBA) programme, this while working

full-time as a consultant to several US-based multi-nationals. The combination of work and study plus job performance culminated in leadership roles: first as Chief Executive Officer (CEO) of a First Nations Development Corporation, then subsequently to a seat on the Board of Directors whose purpose was to jointly oversee the activities of a multi-million-dollar Canadian First Nations corporation. Before my arrival, they, the corporation had established a comprehensive and diversified set of portfolios of investments; some of which presented challenges to what the indigenous sociologists and some non-business researchers perceived as incompatible with a values system; that needed major rethinking for the need to progress with the times. The communities were still dealing with the aftereffects of colonisation – land alienation, wholesale ownership of natural resources by foreign investors and the social ills associated with substance issues and poverty. The politically savvy and business leadership had fishing farms, forestry projects, market gardens, vineyards, event hosting establishments, and casinos to employ and support the younger and better educated membership. The choices were stark: to offer gainful employment to its members in a remote area of the country where no opportunities existed with the promise of work or, to depend on the former ‘colonisers’ for handouts. Welfare was subsistence that barely eked out an existence: nothing more. Those unique experiences bring to this scholarship, aspects of interdisciplinary practises unique to the non-Westernised business model, as tangible benefits, to the burgeoning Sino-Māori trade relationships. From the experiences that included a cross-cultural dimension this was also seen as a continuation of a practicum, as a pedagogy underpinned by a set of practices that can be implemented through an analytical approach such as the Kaupapa Māori theory, an educational philosophy. That aspect was reinforced further by Boud (2001) who said,

[t]hat a curriculum of work-based learning grows out of the candidate’s professional context, past experience and current focus of attention . . . it is therefore, essentially practitioner-driven and located in a

context rather than in an academic or professional discipline.

The research structured workflow cascaded through dependencies that culminated in the deliverables. The disciplines engaged were Information Technology and Information Sciences, cross-cultural social entrepreneurship, quasi-legal, and those attributes for small-business ownership. All focused-on wealth creation for the client my hapū. No economic base existed for them hence the need to deliver a workable economic platform from scratch. Then to create the infrastructure and supporting elements to move their goods and services through to the export markets.

In Aotearoa New Zealand the University of Otago or Te Whare Wānanga o Ōtākou (The University of Otago or Te Whare Wānanga o Ōtākou, n.d.) offers and describes the professional doctorate this way:

- A doctoral level qualification that has direct and practical applications for both industry and employers:
- Knowledge is developed for public good / economic benefit as a direct outcome;
- Structured to allow focus on specific business problems within their own workplace as part of the degree; and,
- May include a professional business case, reporting improvement or development of a specific business area.

This research promises to deliver a prototype shell AI system named He Pātai® to support hapū governance and executive in their decision-making role and to their support group that gleans and gathers current and past data to forecast future business trends.

Background to the Study

Initially this research project set out to create an economic base for my hapū located in one of the highest unemployment regions of the country. It was not always that way. From the early to mid-1800's it was highly productive in exporting pork, milled flour, flax and vegetables to Australia and to some of the South Pacific islands. Colonialism brought religion and land alienation changing the situation for the worst. Wānanga were held to determine the viability of creating whānau, hapū or marae based small business units. The idea was shelved as the main demographic group was the elderly pensioners.

After participating at hui, wānanga, the Māori Land Court hearings and the Iwi Leaders' Forum, the decision was then made to focus research in support of the Māori corporations who were becoming successful in trading with China.

Dr Wayne Ngata, a member of the Research Ethics Approval Committee asked to broaden the scope of this research to examine perceived conflicts and tensions between the rūnanga (constituted under the Rūnanga Iwi Act of 1990, as the framework for the social functions of the iwi), and their commercial holdings or business arm. The latter would be the revenue earning ventures like fishing, farming, tourism, and capital investment as examples. The Ngata request was in effect to examine and report back with recommendations on how to resolve issues, specifically to the notions of "power and wealth" within the two intra iwi organisations. Implicit in the request was for a tikanga-a-iwi based resolutional calculus.

Hapū corporate governance tools

Diversification proved the most remunerative and characteristic of today's corporate. Ngāi Tahu Holdings, the commercial arm of the Ngāi Tahu iwi of Te Wai Pounamu fits, in this researcher's opinion (based on consultancy roles with IBM© and Citi©), that bill. Tā Mark Solomon, the iwi Kaiwhakahaere opened its doors without any reservations to this research inquiry.

They are for corporate purposes nominally described as the large enterprise (LE) of at least 5000 employees with turnover greater than one billion dollars. Underpinning their success was strong intra tikanga-a-iwi relationships. Their client relations department included tri-lingual, iwi members who spoke Mandarin in support of their China trade. The iwi Kāhui kaumātua was forward thinking in hiring some of the best executive talent in this country with the goal of advancing the iwi vision and mission statements. While the senior executive that I interviewed was not Māori, or indeed, a Māori speaker, there was a clear understanding of fidelity to tradition or as they described as Ngāi Tahutanga values.

To a non-Māori person, understanding for example, the fundamental principle of kaitiakitanga in conjunction with Māori living and entrepreneurship is a known, unknown. That is, to have some vague notion or acknowledge its existence or use it in dialogue without being cognisant of its true meaning to a Māori person, or, indeed how the principle is applied or its significance. At the governance and executive levels at Ngāi Tahu, the parties displayed an acute understanding of that demarcation in that governance adhered to the "what", "why", "when", and "where" in their mandate and direction. The "how" however, remained the exclusive prerogative of the executive: no micro-management from either party, the cornerstone, I believe, of the Ngāi Tahu success story.

The perceived need that emerged from the interview.

In dealing with the “how” question was intriguing for several reasons. Firstly, there was the need for the non-Māori speaking executive to consult with a te reo speaking colleague to ensure no tikanga breaches would be made in a soon to be announced decision. Note, here the reference is to a ‘te reo’ speaker. For being a fluent te reo (me ōna tikanga) speaker assumes practising tikanga, as both events are mutually inclusive. Gisborne’s (Who is Meng Foon, n.d.) Mayor Meng Foon (Chinese) and the late Judge David Ambler (2008), a Pākehā, are two prominent examples: neither are Maori. The question then was how to guarantee consistent mātauranga-a-hapū capability to the governance and executive for 24/7 in support of their decision-making processes? Expecting another human to interpret mātauranga consistently would be problematic for although the bedrock knowledge created by the whānau, marae and hapū membership, it could well be different from one hapū to another. This demand goes far beyond the expected human expectations and capabilities.

The same question General Electrics (GE) of the US (Bonnison and Johnson, 1984) asked in the mid- 1960’s when their top Locomotive field Service, their sole expert, was nearing his retirement, was how to replace that critical knowledge? That was how elementary problem-solving mechanisms such as ES was born. That said, the human problem-solver is good only if she / he operates in a narrow domain for expertise is associated with a high degree of intelligence, and not always with the smartest person. Although still in its infancy during the 70’s, computer scientists saw an opportunity to widen that scope to include expertise in all corporate functional areas hence the birth of the business unit known as Management Information Services.

Then for the Māori exporter it begs the question why shouldn't that same functionality guaranteeing tikanga be used to extend whakawhanautanga / guanxi of the trading partners? That their cultural knowledge including rules, protocols and rituals, residing alongside mātauranga would guarantee inter-cultural compliance seemed to be the logical step in advancing technology to govern, to support the tikanga based corporation. Today, technology especially in AI is making the most mundane but important things possible from talking to a synthesised voice at KiwiBank or airline to make a flight booking. Both interpret your requests with the AI doing the back-office functions all without human intervention. That as a Systems Engineer informed by a cross-cultural experience with a Confucian based conglomerate was serendipitous. The experience moved beyond the 'pencil and paper' strategic decision-making, towards producing sound corporate decisions involving two cultures towards, it could happen with hapū. Additionally, at the 'workshop floor' level, during the professional assignment the employee desktop workstations toggled effortlessly between the English and Chinese languages through a rudimentary ES.

The same capability at the hapū export executive desk would be cost effective for interfacing with stock exchanges, investment bankers and importantly, legal compliance with the Securities and Exchange Commission whose function is to protect investors. Back then, I could see future possibilities.

Today, the use of an ES with AI in the Sino-Māori framework would handle the dynamic aspect of tikanga Māori (Mead, 2003: p.25), in addition to the principles of Confucian virtue comfortably without human intervention as its decision and guidance would have been tested using real life scenarios already established by the Hapū knowledge teams with the support of whānau, marae, hapū and any external sources such as the business suppliers.

This research proposes He Patai© or “What_IF” as an ES to be developed as contributing new knowledge in the field of corporate executive management as a “hands on” deliverable. That translates industry experience into a higher position of influence as promised by the professional doctorate. The target corporation for this product is the nominal mid-size (SMB) enterprise of between 10 and 5000 employees.

Contributing knowledge

Personal career experiences in the banking, transportation, corporate, privately held small and midsize enterprise sectors contributed to this research. Leadership of an overseas non-governmental organisation (NGO), also contributed significantly towards understanding the national and foreign legal frameworks and their implications around rules and procedures dealing with their unique documental requirements. The professional experience within the Confucian-based conglomerate in the Republic of China in Taiwan had a profound impact on shaping a personal belief that ancient non-Western approaches alongside mātauranga Māori could work successfully. But that requires a team made up from this research, iwi leaders and the academy to develop a conceptual framework with the necessary structures that would be translated into a knowledge base for He Patai©. The Māori physical, cultural as well as intellectual environments were perceived as in harmony with ancient Chinese rituals and protocols that date back some two thousand plus years.

The host Confucius-based Chinese multinational from the personal assignment had created a world-leading corporation with branch operations in every corner of the globe. Their success was through engaging a ‘soft’ or persuasive approach typically involving the use of economic

or cultural influence with favourable credit incentives. This research favours the same approach, of whakawhanautanga by hapū as being consistent with mātauranga-a-hapū.

For this technical researcher, on reflection, it occurred that if two bedrock philosophies are similar in nature that they would have the same inherent flaws. They do. In mātauranga Māori and Confucian virtue both have what is known as vertical orientation (promotion based on a hierarchy rather than on merit) and nepotism (favouring relatives or friends, especially through giving them jobs).

As a Māori researcher raised in te reo Māori (me ōna tikanga) and who initially lived under tikanga Māori, the career assignment in Taiwan revealed many foundational similarities between the two cultures. That experience gave impetus for this research project. The challenge then was how to articulate the experiences in a constructive way to answer the research questions supporting local Māori and the Chinese entrepreneurs. The outcome was the ES with AI that was capable of meeting both the temporal and physical needs and more importantly, the creation of a repository of tikanga-a-hapū for the ES that may also be used by future researchers.

Another unique experiential skill from the Chinese work experience was learning the cross-cultural nuances, skills and strategies for cross-cultural interchange of commerce from the first simple steps of approach right through to negotiations, thence to concluding a contract. Typically, the contract or orders securement process was protracted and could extend up to a year or even more until the nuances of the relationship were fully understood by the negotiators and ratified by governance then there was the handover to the marketing and sales team.

From day one of the secondment and unbeknownst to us as foreigners the Confucius virtues such as ren, lǐ, xìn, yì, and guanxi were in play; in te ao Māori, the material equivalence of whakawhanaungatanga, karakia, manaakitanga, wairuatanga, and kawa. In the rush to secure the multi-year and multiple billion dollars contract my corporation's negotiators who had fully

grasped (having Taiwanese-born and native speakers) the rudiments of Confucian values but did not propagate them down to the shop-floor level to us employees who were non-Chinese. That would have precluded some of the early tensions for those in the supervisory or mentor role especially for the Confucian virtue of mianzi or whanaungatanga test to always accept the conduct or responsibilities and sanctions on behalf of those subordinate in care. Another critical virtue was establishing guanxi or relationship building to be protracted, for to contemplate less would be both naïve and foolhardy. Once proven however, they would be long-term in effect with the regular need to nurture and strengthen the relationship. While these virtues are indeed consistent with tikanga they need to be reinforced within hapū from the beginning of the cross-cultural relationship and reinforced on the employees.

A mātauranga-a-iwi approach by the exemplar

From (Ngāi Tahu Tourism, n.d.) the tourism boss Mr Quinton Hall and his general manager Mr Steve Lester describes their strategy this way:

When we started this week four years ago, our Chinese counterparts thought we was some sort of government tourism agency? We've spent a lot of time there since . . . that's me and Quinton and our two Chinese language-speaking staff – building those relationships. There's been lots of sitting around a table, eating kai and talking. We talk about where we come from, about the history and values of Ngāi Tahu, and the tribe's identity as tangata whenua of Te Waipounamu.

The following facts were restated before embarking on this research journey:

1. That career experiences contributes to the proposed Sino-Māori corporate development model.
2. There is an understanding of the field of study and current literature on the subject.
3. The research questions clearly articulate the research needs.

4. No published research exists on Sino-Māori export trade.
5. The timing is right for this type of research.
6. Market research forecast a promising future for Sino-Māori trade.
7. This research supports mixed Māori / non-Māori corporations.
8. There is a personal history of working separately with the Chinese and Māori corporations.
9. Significant external material support for this research came from a former Aotearoa New Zealand trade diplomat with extensive experience in China.

Aim of the research question

This research speaks to several audiences, discussing their needs, anxieties, tensions (both real and imagined) and, expectations. It is also inter-disciplinary for the linkages between the Social Sciences (culture, economics and law), the Humanities (geography, history, languages, philosophies), and Applied Sciences (computer science, information sciences, engineering and technology). There is engagement of epistemologies and the different ontologies of Māori, Chinese and the Information Sciences for business negotiating and strategising in the applied sciences. Axiology, the studies of the values of both the researcher's own and the various stages of the research process are considered. All must meet Te Whare Wānanga o Awanuiārangi requirements. That notwithstanding, the primary audience is the Māori corporate governance decision-maker.

The research questions

The following questions support the goals listed above.

1. How to culturally manage hybridised data frameworks to deliver sustainable equitable decisions?

2. How to manage and deliver an optimised AI engine that produces those decisions?

Overview of the research questions

Each research question establishes the general theory of the phenomenon. Through a rigorous intellectual framework, each will be deconstructed by critique and subjected to counterpoint and inversion. Then they will contribute to the discourse of advancing the aspirations of the iwi and its sub-entities towards their goal of sovereignty and self-determination, thence to that desired state of human flourishing.

Key terminology

To provide context for the cross-cultural and multi-disciplinary nature of this thesis, a list of definitions is provided here to supplement the glossary section expressed earlier. This provides the reader an outline of the extensive terminologies. This list is broken down into the two main themes of the study: managing optimised data bases and the strategic tool for hapū corporate governance and its research kāhui.

Question one: How to culturally manage hybridised data frameworks to deliver sustainable equitable decisions?

Aotearoa New Zealand data generation

The term Māori in general speech has according the Ngata¹ Māori dictionary several meanings ranging from: normal, usual, natural, common and ordinary. For the purposes of this thesis it will adopt the ordinary meaning of the word as the indigenous people of Aotearoa New Zealand

¹ Named for Ngata, Apirana Turupa (1874-1950) of Ngāti Porou; national leader, land reformer, politician and scholar. Educated at Waiomatatini Native School, Te Aute College and Canterbury College. Graduated with a BA, An MA and LLB. First Māori to complete a degree at a New Zealand university. Knighted in 1927. Retrieved from <https://maoridictionary.co.nz>

(Smith, 1999, p. 6). (It's uses here is not to be confused with Cook Island Māori who reside in the Cook Islands of the South Pacific.) In the Aotearoa New Zealand context Māori identify through their iwi (tribe), hapū (sub-tribe, or extended whānau) and whānau often translated as 'family' but its meaning is more complex (Rangihau, 1975, p. 190) for the term may have physical, emotional and spiritual dimensions based on whakapapa (genealogy). Aotearoa New Zealand Legislation recognises the Māori tradition of whangai whereby a child may be raised by someone other than the birth parents – usually a relative. The whangai is for all intents and purposes recognised as member of that whānau. The term Pākehā² refers to any person of European descent. In Māori, the word mana is loosely defined as power, authority, status, prestige and integrity (Winitana, 2013, p.170). For the purposes of my thesis mana is a great personal prestige, character and authority that has been defined in tikanga-a-hapū, to the titular head of the corporate organisation whether the board chairperson or chief executive officer regardless of age and gender. This delegation of authority also assigns responsibility to his/her subordinates and is fully articulated for that period of the appointment in their roles and responsibilities in the form of Minutes, protocols or informal notes underpinned by the Trust Deed³ of the hapū trading or holding corporation.

Whakapapa according to Mead (2003, p. 42) “is a fundamental attribute and gift of birth”. As such it may determine a position within the hapū structure. How that attribute is recognised in the hapū corporate structure will be determined by the Kāhui kaumātua in its deliberations of leadership for they may have that authority. Meritocracy may be a possible justification for such a decision. Mead (2003, p.11), teaches that tikanga is derived from the word tika meaning correct or right. Moreover, it is handed down from atua, an ancestor

² Originally applied to English-speaking Europeans only living in Aotearoa/New Zealand. Retrieved from <https://maoridictionary.co.nz>

³ Rules and trust deeds describe the constitutional document that lays out how the board or entity is to operate and how the trust property is to be administered. Established by New Zealand legislation under The Charitable Trusts Act 1957.

with continuing influence, god, demon, or supernatural being. Kawa is the procedure (Mead, 2003, pp. 11–12) the iwi and its sub-entities must be tikanga compliant in its business conduct.

Mātauranga Māori is defined by Mead (2012, p.13) as “[a] cultural system of knowing about everything that is important in the lives of the people”. Doherty (2012, p 19) asserts that mātauranga Māori as a body of knowledge that links customary, modern teachings and philosophies.

The Māori Land Court was established by parliamentary legislation (Te Ture Whenua Māori Act, 1993) and is the judicial forum through which Māori or others interested in ownership or the management of Māori land. The hapū business referred to in this research as “Holdings” is created under separate legislation namely the Companies Office of Societies and Trusts through the Incorporated Societies Act 1908 legislation.

Ngāi Tahu Holdings of Te Wai Pounamu is both an exporter of seafood and an importer through their tourism corporation⁴ of one million customers per year who visit their fourteen different attractions. At Tāhuna (Queenstown), Ngāi Tahutanga, their culture and history inform the guide’s narrative that is also offered in the Chinese language. Through a kanohi-ki-te-kanohi (eye-to-eye or personal interview) with its Chief Financial Officer, and access to all iwi data on the public domain, to their publication titled, Te Karaka©, they constitute the exemplar, one of three by this research.

Confucian Philosophy based data generation

There was extensive historical and philosophical data on Confucian philosophy from the PRC, Japan, Korea and the US. Neo-Confucianism scholarship, a movement in religious philosophy

⁴ Retrieved from <https://www.ngaitahutourism.co.nz/> at July 23rd, 2017.

derived from Confucianism in China around AD 1000 in response to the ideas of Taoism and Buddhism, came mainly from the U.S. This research's need was to find publishable and applicable only data on Confucianism, from which to create a strong culturally based business framework to support the tikanga-Māori based exporters.

Fortunately for this research there was ground-breaking practical and academic scholarship on Confucianism ethics and virtues in business and published individually and jointly, and in English, by Dr Sik Liong Ang and Professor Dr Patrick Kim Cheng Low. That body of critical knowledge published between 2001 and 2013 was drawn on heavily by this research project. Both authors have published world-wide in the markets of interest to Māori exporters. Both interpret in Chinese (through various dialects) and English the present-day applications of Confucian ethics and business lessons derived from Confucius' sagely wisdom. For this research's part the scholarship is articulated from two perspectives: Confucian and Western thoughts to be juxtaposed with the principles of mātauranga Maori. Confucius (Pinyin: *Kǒng Fūzǐ*), according to Low and Ang (2012) influenced the Chinese, Japanese, Korean, Vietnamese and Chinese diaspora living in other South East Asian countries, through business and culture and life with Yang (1961) stating Confucius had some influence in the Western World also. His ideas have, in fact been lasting stated Low and Ang (2013a). Confucianists recognised and propounded that Tao, meaning "the way of life" in Low and Ang (2013a) is also the wisdom and ultimate purpose and enlightenment in one's life. In Low (2011) embracing and practising Confucian ethics enables one to self-cultivate in pursuit of the *Tao*. In the Confucian sense (Low, 2001, 2002, 2005, 2006, 2010a, 2010b, 2011) being benevolent (manaakitanga) or kind (aroha) is a characteristic element of humanity and a part of an individual's talent. *Tao* in governance stresses personal cultivation and self-discipline and self-regulation (Low & Ang, 2013a, 2013b).

Ethics (德 , *dé*) is a value (tikanga) or standard that a person adopts (Low & Ang, 2013a), strongly believes in, upholds, and lives by.

Confucian Ethics are values of core beliefs, some of which (with Māori equivalence) ideas and things people care and believe most (Low & Ang, 2013a) giving a sense of right and wrong (Low, 2005, 2011). Mātauranga Māori shares similar values with for example filial piety or *xiào* (whakawhanaungatanga) and trustworthiness or *xìn* (pono).

Corporate Social Responsibility (CSR) as defined by the World Business Council for Sustainable Development in (WBCSD, 2000). Confucianism and tikanga Māori both stress on the compelling (Low & Ang, 2013b) need to return or give back to the community. Moreover, Low and Ang (2012) stated the goal of CSR is to embrace responsibility for the company's actions and encourage a positive impact through its activities on society and environment (kaitiakitanga).

In the paper titled, "Do culture clash?" Professor Uz (2014) presents the Giddens (1990) view on globalisation as the linking of all civilizations that would result in homogenisation. From the Māori perspective that would resemble colonialisation that evolves through phases of Western modernization and as such, is repugnant to us indigenous who have been subjected to that form of oppression. Another view was polarisation (Eisenstadt, 2000; Hamilton, 1994) that suggested Westernisation is not a pre-requisite of modernity. This research viewed all the possibilities then decided based on what would be compatible with mātauranga Māori and Confucian virtue, to adopt the Chinese shift to modernity by adopting capitalism, scientific rationalism and the specific interpretation of these values as an assimilation to the Chinese culture (mātauranga Māori) itself rather than direct mirroring of the West (Hamilton, 1994) and cited by Uz (2014). That is perceived as one of the contributing reasons for the PRC being

the world's second largest economy and will continue to succeed, being masters of their own destiny. That is also seen as the preferred path for hapū.

Question two: How to manage and deliver an optimized AI engine that produces those decisions?

The rationale for investigating the deployment of AI transpired after the conversation with the Ngai Tahu CFO (Ngāi Tahu Deed of Settlement, n.d.), a leading Māori owned multi-billion dollar enterprise, and also informed by a consulting career with the US banker, Citibank©, a US\$1.8 trillion enterprise.

The sheer volume of commercial knowledge as well as the demands from the two underlying philosophies of mātauranga Māori and Confucian Virtue could not be successfully transferred to humans. Aronson and Turban (2001) writes that,

there is the need to capture human knowledge in a form recognised by a computer who then solves a problem that ordinarily needs human expertise to specify the procedural steps and reasoning to arrive at a decision or to offer multiple decisions in a matter of nanoseconds.

The human limitations identified by (Brim, David, Glass, Lavin & Goodman,1962; Dewey, 1910) are based on five sequential phases designed to produce a solution. There exist situations in both Confucianism and Mātauranga Māori where AI would resolve idiosyncrasies using “organic tikanga” for Māori; or in, Neo-Confucianism, “creating a Confucius for today”.

Processing both concepts requires additional complex programming (provided by this

researcher) needing validation by the HMMead_Algorithm© and has been identified for creation later in this these based on the Structured Systems and Analysis Design specification (Langer, 1997). Hapū knowledge will reside alongside the Sino-Māori underlying philosophical data. The “What_IF” inquiry mode in He Pātai© will also interrogate other (if there is a contractual partnership obligation) corporate system, both internal and external systems to resolve any idiosyncratic exigencies of the partnership.

Other key terminologies

Understanding the concepts and theories of AI requires the fundamental understanding of the concept of an algorithm that has its roots in Muhammad ibn Musa al-Khwarizmi a Persian mathematician lived from 780-850 AD. Computer scientist Gurevich (2000) taught that algorithms are essential to the way computers process data. A Māori-centric algorithm created by this research will co-exist with the possibility of a million others. The following algorithm is an example of a commonly coded routine that is non-proprietary (meaning not owned by any one person. Much like expressing the equation of adding one and one to equals two ($1+1=2$). We know it is there, people world-wide use it, and it does not have an owner name label attached).

```
Algorithm:
int i, even;
  i := 1;
  even := 0;
  while ( i < k ) {
    even := even + 2;
    i := i + 1;
  }
return even.
```

Figure 2. The recursive algorithm

Algorithms exist logically meaning they cannot be viewed visually in a form that makes sense such as Figure 3, to the human eye. While a more detailed description of algorithms and He Pātai© (Māori for "What_if?") , the Expert System, is defined at Chapter 5 – Case Study Two – Artificial Intelligence, it is important here to understand their (tikanga) role is to guarantee tikanga. As an implied warranty of fitness, this fundamental governing principle is hitherto exercised only at intra-hapū level. Now, the hapū exporter must incorporate it as a mandatory element in its trade calculus. You may ask is this level of added complexity necessary? Let me explain.

The application of tikanga at the intra-iwi sub-entities levels

At the whānau, marae and hapū levels tikanga is a norm, an unwritten rule and will continue to do so for mātauranga-a-hapū (Mead, 2003) has its own unwritten mechanisms that include those for any dispute resolution. Any tikanga-based decision is passed on judicially in-house

by its leadership. External relationships on the other hand, especially in trade are a totally different matter

Exercising tikanga-a-hapū at the corporate level

While Māori has historically been successful (Petrie, 2002) in international trading since the early 1800's, today after the hiatus of over a century, they alongside their Kiwi counterparts are required to undertake a more sophisticated approach, incorporating high levels of complexity and structures meeting the market's challenges and competition. Moreover, there is the need for compliance with international laws and treaties, best business practises, to have an operational research capability, and the various dispute resolution mechanisms. But what distinguishes the hapū corporation from its kiwi counterparts is fealty to tikanga and, should the partner be China, that their bedrock philosophies including Confucian virtue be respected. This then begs the question: is tikanga-a-hapū in its current unwritten form acceptable within my hapū corporation for the purposes of international trade? The answer is no.

Firstly, the legal authority in Aotearoa New Zealand for my hapū Ngati Te Ao to resume international trade and to assert its autonomy world-wide is based on being a treaty partner and invoking Ko te tuarua o te Tiriti o Waitangi⁵ that states:

[k]i nga Hapū, ki nga tangata katoa o Nu Tirani, te tino
Rangatiratanga o ratou wenua o ratou kainga me o ratou
taonga katoa.

For business, tikanga-a-hapū is recognised as the body of fundamental principles and precedents from what the corporate uses as the guide for making business decisions. It is also published as a public document being available in the form of the Trust Deed on the New

⁵ An English commentary and not English translation: the second article of the Treaty of Waitangi of 1840 that guarantees the hapū chiefs their chieftainship over their land or homes or their gifts. Retrieved from: <https://nzhistory.govt.nz/politics/treaty/read-the-treaty/maori-text>

Zealand government business website. My hapū kāhui heard the arguments for and agreed to the need to codify tikanga-a-hapū for it contributes to generating prosperity for itself and especially for our mokopuna.

The hapū corporation and bounded rationality

By adding codified tikanga-a-hapū (and eventually the underlying philosophy of a hybridised partner) to the corporate constitution, this introduces a further level of complex processing to decision making. At this level the stakes are high where errors in human judgement may offend the partners or indeed, potential lucrative contacts lost. The permutations or lists of decisions and combinations thereof are countless. Take for example, where unknowingly a breach of the principle of kaitiakitanga (guardianship) over profit occurs. Using HMMead_Algorithm©, this research has determined that hapū needs AI such as the proposed He Pātai© the ES to support its hybridised approach to international trade and where it will highlight these possible anomalies such as the kaitiakitanga breach. This is one good example where AI will highlight the lack of human recognition.

In international trade there are new demands on hapū leadership in what the Nobel Prize in Economic Sciences recipient Herbert Simon (1991) described as bounded rationality. That complex operational decision-making is described this way:

[I]s the idea that when individuals make decisions, their rationality is
Limited by the tractability of the decision problem, the cognitive
Limitations of their minds, and the time available to make the decision.

Add other hapū mandatory elements to that decision equation such as best management and

business practises and its potential partner(s) underlying philosophies, language and culture. The ES will instance or make multiple tikanga-based business recommendations to hapū leadership and that challenges Simon's cognitive limits in offering integrated business solutions and options in the matter of nanoseconds. This last measure is critical to effective managers in multi-billion-dollar decision-making.

Research vectoring

Two critical research vectors were utilised in the development of the research questions. They were:

- a) Research question one: Legal argument theory in Year-1, LLB of the year 2010.
- b) In narrative form in Mead (2003: p 335) who predicted future challenges for Māori this way:

All around us are issues that have either not yet been addressed, or discussed seriously, or are yet to be verbalized. The Māori world is assailed by these issues that are not just local but tend to be argued internationally and eventually come here . . . Māori population has to join the discussions and at this point such matters often become difficult.

Applying Langer (1997) this research has modelled an AI system based on foundational (Mead, 2003) alongside national (The New Zealand Law Commission, 2002), Confucian Ethics (Low and Ang, 2012, 2013) and hapū centric legislation, tacit, hybridisation theory to form the syntax, variables and loops that integrates every element of the hapū decision-making calculus. This unique methodology describes a computer system for the purpose.

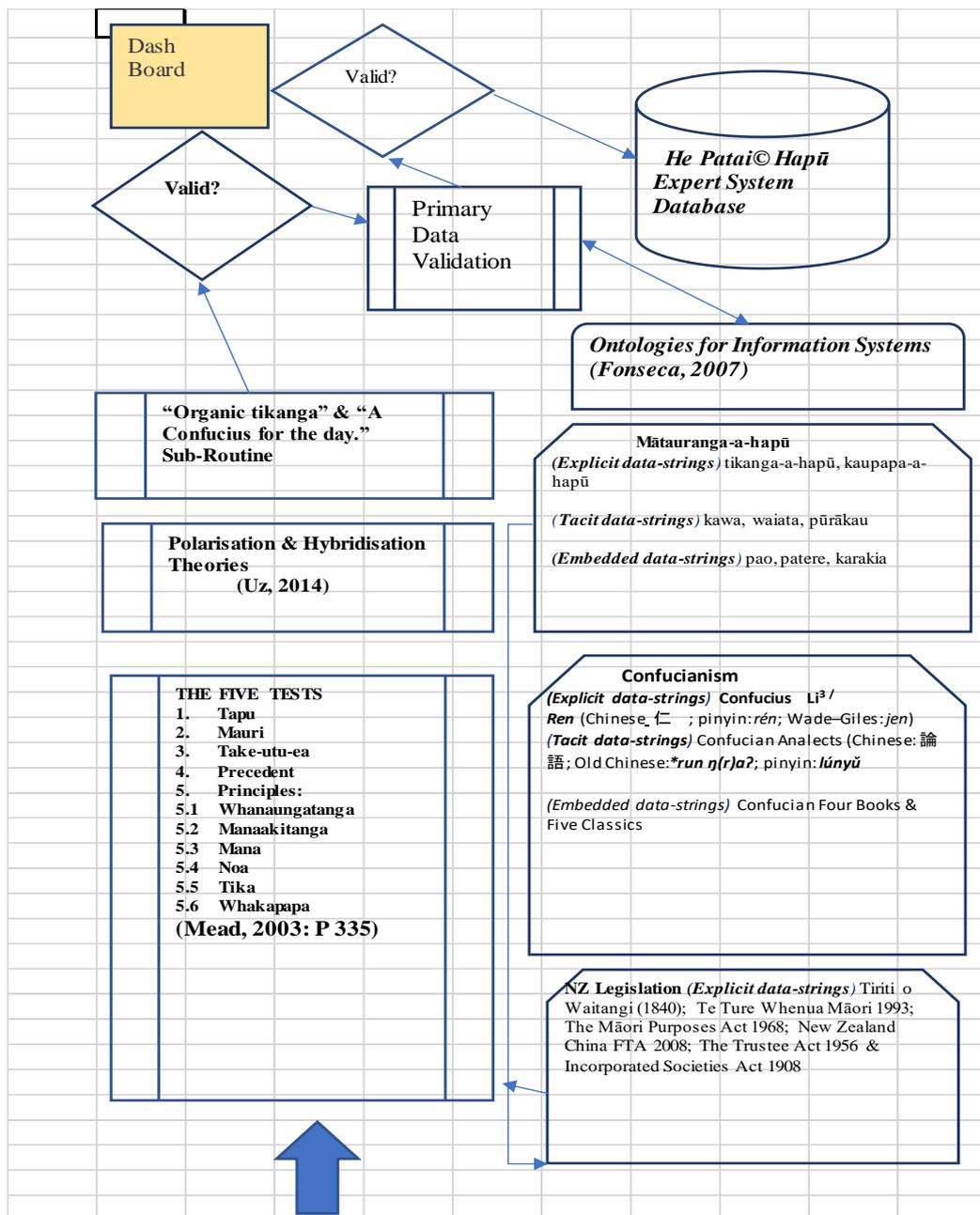


Figure 3. The HMMead_Algorithm(c)

Knowledge Base (comprising matauranga-a-hapū, Confucianism and New Zealand Legislation), the database confirms three types of data input: *Explicit* (codified and stored in certain media); *Tacit* (difficult to codify but with modern techniques it is able to display for example what Eruera Stirling said to Sidney Mead about mātauranga Māori in Mead (2003, p 6) or, *Embedded* (able to generate computer data that will translate te reo Māori and Chinese artefacts of words and pictures into binary formats (using ‘1’ and ‘0’) to enable the languages to communicate with each other.

An Inference Engine driven by artificial Intelligence to query “What_if” situations that will affect organic tikanga and hybridity of the cross-cultural trade. Its components include modules known as “Five Tests” (Mead, 2003), Polarisation and Hybridisation (Uz, 2014) and a Default Organic Tikanga sub-routine.

Like your car or pick-up truck, HMMead also has a Dashboard. It allows an authorized person with the unique logon name and password to “log in” to He Patai© and use the tool to gather strategic information or simply to ask “What if” questions. All transactions are logged to compile an audit trail of changes, additions or deletions of data for security purposes within the Knowledge Base.

To develop and support He Pātai© as the technical solution for cross-cultural trade interchange by Māori, a User and Technical Support team will be trained by the non-profit entity called The Mei Ngarama Rapihana Foundation© hereafter referred to as “Foundation.” The purpose being to meet New Zealand legislative requirements.

The software module annotated with Fonseca (2007) holds Confucianism and mātauranga Māori as geographic artefacts and codified in symbolic representation to offer or make decisions in such areas as cross-cultural trade or around in-house legal compliance based on

trust deeds. This researcher will utilise Microsoft Visual StudioIDE (code editor)⁶ and c# (c sharp⁷) computer generated code to create under the direction of the HMMead_Algorithm©, software to invoke mātauranga-a-hapū, specifically tikanga-a-hapū with Confucianism (both codified) as well as other Application Programming Interface (API) (a tool in a software library that allows the programmer to quickly use someone else's code - legally), to develop case based scenarios by hapū Knowledge Engineers, under supervision of Foundation. Both test and production results will be verified by kāhui to ensure tikanga compliance, to then update the ES and AI. Quality assurance will be consistent with ISO / OEC 9126⁸ to ensure that the HMMead_Algorithm© and its functionality maybe marketable to other hybridised markets, the objective being to make hapū an exporter of Knowledge Engineering software, as a service to others in a bureau or, as a package for their ownership.

The Hapū Expert Systems Database is a computer file storing historical data for analysis by the hapū marketing and sales departments. It will be interrogated by the Artificial Intelligence part to synthesize previous and newly added data to arrive at a decision.

To visualise the process flow in He Pātai©, this graphical representation describes a general, non-proprietary, recursive algorithm. Bartlett (2018) illustrates it this way:

For new computer science students, the concept of recursive programming
Is often difficult. Recursive thinking is difficult because it almost seems
like circular reasoning. It's also not an intuitive process; when we give
instructions to other people, we rarely direct them recursively. For
those of you who are new to computer programming, here's a simple definition
of recursion: Recursion occurs when a function calls itself directly or indirectly.

⁶ The source code editor is a text edit program designed to check computer source code for syntax or grammar errors by a human computer programmer. While using your Laptop or Desk PC it also uses an editor program in the background to check spelling and grammar or any other required functions.

⁷ A computer language is a system of communication with a computer that includes a programming language designed to communicate instruction to a machine, particularly a computer. Languages such as Algol 63, Fortran IV, Basic, Basic Language Assembly to name just a few.

⁸ ISO/IEC 9126 is the international standard. Software engineering – product quality international standard for evaluation of software quality. Compliance by hapū Knowledge Engineers will ensure that He Patai© as an ES with AI product is marketable.

The conceptual framework offered information input for the HMMead is parametrically driven (described in the glossary on page 20). It is also analogous to the $1+1=2$ example above, it is generic, and no one can claim ownership.

The He Pātai© algorithmic framework is secured by multiple layers of authorizations to protect data integrity through a password-controlled library alongside the hapū owned esoteric (specialised hapū cultural and commercial proprietary) data. All mātauranga-ā-hapū includes tikanga is imbued with the wairuatanga (mauri) and supported by regression. To describe regression in simple terms: the baking⁹ of the typical Kiwi pudding or desert found at most family functions. If at each time the baking recipe is used and a new ingredient is added (for whatever reason) family members may comment on an improvement or detriment on the previous baking and their opinions are solicited and recommendations made for the next family get together. Substitute for the purposes of software quality control an ingredient such as a revised element of a customer belief system, a new tikanga¹⁰ for example. The equivalent ‘taste test of the family member’ is a computer algorithm that views the results and highlights differences that could be acceptable or unacceptable.

In the pudding test, excess salt could repulse the family member’s taste buds and memory resulting in total rejection of the loving baker’s efforts. A manual review of the pudding-making process will point to the quantity of the offending ingredient resulting in a promised mental adjustment for the next baking exercise.

Computer processing by another algorithm ensures later iterations of new tikanga or Confucianism virtue pass an integrity test separately with a manual parallel validation method

⁹ Apologies for this simplistic illustration being used to help illustrate the machinations of IS or IT.

¹⁰ Tikanga is dynamic as well as static. For business purposes kāhui has the authority to approve a new tikanga or indeed implement modifications to an existing one to improve it for any number of reasons.

by kāhui for tikanga so that newly introduced tikanga or commercial data does not contaminate trusted existing data and their processes.

Significance of the research

While the development of information and communications technology (ICT) in support of the multi-billion private sector corporations has reached its zenith, and the iwi corporate operates comfortably within that cultural homogeneity while openly asserting tikanga, for hapū, a major technology ‘gap’ nevertheless exists.

Informed by an IS and IT career of over thirty-five years this research presents a viable proposition in He Pātai© based on Uz (2014) for an intercontextual theory of hybridity that comprehends global cultural dynamics for a critical cultural transnationalism.

He Pātai© has multi-level decision-making capabilities for complexities involving theories, models, new and old algorithms, to support governance and the type of decision-making required by the hapū exporters. Moreover, its functionalities and purposes are listed here as promise(s) and not guarantees, as being consistent with product liability legislation and follows the present description in IS and IT contractual standards¹¹:

- Promises governance (policy makers) and executive (decision-makers) hereafter described as “Users”, access to mission-critical data in which to formulate decisions.
- Beyond satisfying hapū commercial and cultural needs it will implement the cultural hybridity framework based on Uz (2014) to underpin an export trade

¹¹ Guarantees are determined in the standard contract by three factors: and agreed time to develop the functionality by project; materials including computer development and production systems; and, providing the human and infrastructure resources.

agreement using the codified cultural norms and rules of tikanga with Confucianism in a proposed Chinese and Māori / hapū trade agreement.

- Following implementation of the Confucianism database, Users will be promised responses of Chinese to Māori queries from in-house translate tables or a subscription service such as Google Translate© a bureau service provided by the parent company Google©. Chinese owned corporations will access He Patai© remotely after a joint-agreement contract is finalised between the parties.
- It promises all queries and responses be in te reo using te mita-a-hapū to be consistent within the bounds of Māori cultural norms, values and beliefs. (The Mozilla© open source speech recognition software will be modified by the hapū knowledge engineers be able to translate English responses to Māori – specifically, mita-a-hapū.)
- He Pātai© will also promise to serve as an educational tool teaching both the hapū and Chinese Users in understanding the Query and Responses constructs that leverage cultural differences in optimising whakawhanaungatanga and guanxi.
- He Pātai© promises to uphold the integrity of both hapū tikanga and Confucianism.
- Through HMMead the concept of ‘organic tikanga’ is supported by He Patai©.
- Promises investment strategies are consistent with hapū values such as kaitiakitanga and related Confucianism principles.
- Will recommend clients whose cultural principles are in line with tikanga and support the cultural hybridity framework based on Uz (2014) to form a trade relationship. Such countries include but not limited to Singapore, Taiwan, Korea, Japan, and Vietnam who subscribe to Confucianism, with some variation. e.g. Taiwan uses traditional

Chinese rather than Modern Chinese in their communications (this difference is important to remember).

- The He Pātai© data interchange tables to support both macron and non-macron use in the spoken or printed word of ā ē ī ō ū in the standard collating sequence. (This function will be carried out by the hapū Knowledge Engineers under the supervision of this researcher.)
- Provision of interfaces with external sources such as the central government of New Zealand online databases.
- Uses Natural Language processing (that uses computer techniques to analyse and synthesise natural speech – an example is the present capability to speak directly to a bank owned computer to obtain account information) by way of AI to receive voice instructions to an inquiry.
- Offers access to hapū workstations, tablets, cellular phones and personal computers.
- Tikanga compliance. Compels leadership who may not be hapū members, or even Māori, or non te reo speakers to default to rules established by the hapū kāhui and the marae. Absolutely no deviations that would undermine the underpinnings of hapū, jeopardising any relationship especially a trade pact.
- Highlights then deliberately moves through a step-by-step process that evaluates all possible decisions (that could exceed millions in some complex business transactions) using rules established by algorithms in general and especially for Māori.
- Mead (2003) in its entirety is encapsulated to create millions of situations with handling ‘exceptions’ like for example, organic tikanga. Each of these ‘situations’ will be created by hapū members trained to be Knowledge Engineers. Other new business relationships will add their sets of pre-set (‘real’ or ‘perceived’ business or cultural)

‘situations’ such as Confucianism. Another example would be a joint trade agreement with a Comprehensive and Progressive Trans-Pacific Partnership (CFTPP) member using their own kind of “tikanga” that every indigenous culture established in their pre-colonialist era, as governing principles for their society, into a cultural hybridity framework based on Uz (2014).

Regardless of the customer query, responses will return instantaneously. He Pātai© will exchange data with other Information Systems providing analytical methods in information, statistics, data science, prospecting, market simulations, sales forecasting, optimisation, probabilities, and statistics. It is also interactive using internal and external data sources plus parametric input solving unstructured and semi-structured problems through multiple levels of complexity. Its immediate benefit or Return on Investment or performance measure to the hapū or iwi-based corporate is the programmed power of deducing through reasoning, new knowledge-based narratives from ontological, epistemological and axiological perspectives for interpretation and understanding. This being the essence of cross-cultural relationship-building or whakawhanaungatanga.

He Pātai© is scalable, in that it can be used with the smallest unit being a whanau/ marae to a major configuration including several iwi sized corporations through hybridising (a term originating in biology, from hybridity). Hybridity is used in post-colonialism and globalisation (Uz, 2014) discourse, and in this context to mean joining a variety of disparate groups whose underlying philosophies or belief systems may differ. To all queries, He Pātai© produces swift verifiable results primarily, as a tool for any hapū governance and its executive to support all aspects of managing a billion-dollar enterprise. After training by Foundation, all hapū knowledge experts will research, initialise and maintain the Knowledge Base. Through a tikanga-based formal process on the marae the trained hapū Knowledge Engineer(s) steeped in

mātauranga-a-hapū and tikanga-a-hapu will gather verified hapū qualitative and quantitative data to be formalised and placed in their epistemological and ontological order as artefacts to be formalised by the principles of the Information Sciences for populating the Knowledge Base. Each stage preceded by karakia to attain the necessary mauri.

Overview of Methods

The purpose of this research project is developing the mātauranga-a-hapū to gain economic prosperity as promised in its mana motuhake and tino rangatiratanga, towards the state of human flourishing. To attain that goal, Smith (1990) espouses Kaupapa Māori as the overarching principle for research as done by Māori, with Māori and for Māori. Kaupapa Māori is informed by tikanga Māori, as the ways to accomplish building strong and healthy relationships based on mutual trust, respect, reciprocity and whanaungatanga (Bishop, 1996), all described as norms, as typical of, or a collective expectation of group behaviour. In the foreword to Mead (2003), the Māori jurist, Justice Sir E. Taihakurei Durie (1994) stressed that tikanga Māori is fundamentally about the future. Tikanga like judicial law, it is prescriptive (is a rule of conduct that imposes a relationship that may or may not naturally exist), as opposed to proscriptive that says, “DO NOT DO THIS,” – that prohibits an action. Tikanga is a norm derived from mātauranga Māori. Both Low and Ang through Low (2001, 2002, 2006, 2013) and Low (2012), present business practises based on the Confucian perspective in South East Asia, particularly in Brunei (a sovereign state located on the north coast of the island of Borneo). Their extensive scholarship on Confucianism teach that,

the emphasis on leadership with integrity, which is linked to positive, harmonious relationship as well as to the values of benevolence and

reciprocity . . . Confucian teachings can bring much peace, learning, and growth for the business sustainability.

During this research project I travelled to several countries who subscribe to the Confucian philosophy to confirm what was previously experienced at the Taiwanese conglomerate where I once worked. That included the PRC and Hongkong (Special Administrative Region of the PRC), the Republic of Singapore, and Malaysia (the mainland as well as the state of Sarawak). It was an informal visit to local chambers of commerce, national libraries and with small-business owners who were predominantly Chinese owners. For ethical reasons their input could not be used in this thesis however, the experiences gained combined with personal interactions were noted to be used to create the backdrop in developing the Confucianist artefacts for the He Pātai© knowledge base. Their data supplied was not readily available in the literature. A parallel situation in te ao Māori was recording the whakamātautau experience described by Mead when describing Te Whānau-a-Apanui kaumātua Eruera Stirling's conversation with the historian Judith Binney (Binney, 1968).

Outline of the thesis

Chapter one - The introduction outlines the two questions this thesis must address.

It also offers foundational knowledge underpinning the stated goals from two epochs: two underlying philosophies from time immemorial that will, through use of a “browser” in a “smart” device from current technology uphold fealty in a Sino-Māori corporate governance model. An overview of the terminology is contextualized within kaupapa Māori, Confucianism and applied research in the Information Sciences design parameters and constraints.

As the researcher, I position myself as a full participant within this study in the roles of a hapū member, an elder based on being a septuagenarian, a researcher, and Systems Engineer who will design, develop, support and deliver the AI named He Pātai(c). Hybridity is used in post-colonialism and globalisation (Uz, 2014) discourse, and in this context to mean joining a variety of disparate groups whose underlying philosophies or belief systems may differ. To all queries, He Pātai© produces swift verifiable results.

Chapter two - The literature review. Research identified two *deliverables* to meet the perceived specifications of a professional doctorate in indigenous advancement and development in the information sciences & business technology. While there is no published scholarship connecting mātauranga Māori with Confucianism in business, there was, however, a successful practitioner in Ngāi Tahu of Te Wai Pounamu (South Island of New Zealand) who has generated contextual knowledge. Their combination of effective leadership, strong institutions, astute hiring practises of highly successful executives while holding true to historic Ngāi Tahu principles, to serve in the opinion of this researcher as the hallmark for success. Peer-reviewed scholarship (Mika and O’Sullivan, 2014; Harmsworth, 2009; Barlow, 1993; Marsden, 1988; Spiller, Craze, Dell and Mudford, 2017; Dell, 2017) from the social sciences was reviewed establishing small business in NZ.

To be credible, He Pātai© AI architecture must first comprehend mātauranga and Confucianism; then, interpret queries, mull over various facts, resolve conflicts, and negotiate “exceptions”, to arrive at a sustainable equitable decision.

Māori are exercising their Constitutional right vested in “He Ko te tuarua¹² o Te Tiriti o Waitangi” (Article 2 of the Treaty of Waitangi 1840) that promises self-determination. Māori

¹² The Māori version retrieved from the Treaty of Waitangi Act 1975. Reprint as at 27 June 2018. Retrieved from <http://www.legislation.govt.nz/act/public/1975/0114/98.0/DLM435368.html>

entities can engage on their own behalf, bilateral foreign trade and relations¹³. By engaging in foreign trade Māori enters *globalisation* as described by Giddens (1990) and their consequences. Polarisation explained by Eisenstadt (2000) and Hamilton (1994) suggested *Westernization* along with the merits of *modernity*. The hybridization hypothesis that focused on interactivity between different cultures became the candidate of focus leading to adopting the narrow focus as articulated by Uz (2014) for there were other commonalities between Māori and the potential business targets with comparable underlying philosophies.

Chapter three – Research methods and methodologies. This chapter has been written in nine sections. **Firstly**, it examined the foundational, ethical and values systems used in the proposed Sino-Māori corporations to decide whether they were compatible. If not, what could be used to ‘bridge’ any anomalies. Beyond that, ‘how to adjust through thinking organically’. **Secondly**, it sought the governance tools to meet the corporate mandate from traditional shareholders being the whānau, marae, hapū through to iwi. In current demographics that could include non-Māori who through giving financial support become shareholders in the iwi corporation. The ownership permutations were many. **Thirdly**, cultural hybridity was found to develop and set up the core and cultural competencies for governance of the various permutations. Each external relationship by Māori needed their unique hybridity model. e.g. an Indian – Māori trade pact or Māori and Peruvian enterprises from the CPTPP. However, as China, Korea, Japan, Taiwan, Vietnam and Singapore, collectively known as SINIC (Medieval Latin from the 1660’s, Sinicus – “from China”) countries subscribe to Confucianism this paradigm would be compatible for each prospective partner with some minor adjustments for their variances by virtue of language. **Fourthly**, the Māori whakawhanaungatanga and Chinese guanxi value systems were examined to find commonalities. A fact-finding visit to the Peoples Republic of

¹³The World Trade Organisation (WTO) of which Aotearoa New Zealand has membership, a dispute settlement gateway that underscores the rules-based system for resolution.

China was made in addition to my supporting Chinese Mandarin language lessons in my hometown of Whangarei. *Fifthly*, there was a need to understand how the Chinese population in Aotearoa New Zealand perceived Māori as a backgrounder to developing trade relations. Through membership of the various Chinese community and business oriented organisations such as the New Zealand China Trade and the Asia Foundation gave what was not published in this country.



Figure 4. The Sinic-Iwi Research Foundation(c)

This research used its legal knowledge and practise to create a Non-profit, legal entity duly registered in New Zealand for the purposes to establish a Sino-Iwi formal relationship whose purpose is to promote Sino-Māori trade, support and of course the He Pātai© tool.

Its trustees include exponents in mātauranga Māori and Confucianism through a trustee domiciled in the Peoples Republic of China but who graduated in New Zealand with business studies, Māori leadership with experience in cross-cultural relationships to develop approaches that were culturally sensitive, as a guide to this research. *Sixthly*. The Discovery, or pre-trial procedure in Law, was used alongside inquiry-based learning theory where no publishable data was available to support the Case-Study Approach to create this scholarship. *Seventhly*. After a sound management plan with credible leadership and governance there was still the need for

a sound financial – capital investment plan. No models existed for Māori exporters that were credible from the standpoint of investment bankers. That needed the creation of what is colloquially known as “The Business Case.” Published works on small and medium enterprises (SME) tikanga-Māori based businesses fell well short of this research’s requirements.

The elements of a “Risk Assessment”, where financiers weigh up their options including rejecting the business case was completed based on the strict requirements of the consulting banks, the Courts, and investment groups coupled with knowledge gained from a personal background with a major international bank. On a more personal scale, the basic process is not that much different to presenting yourself to the local bank or finance office to borrow money to buy a car or to purchase sheep or cows for the farm. The Loan Officer wants to invest in your idea or goods, to take a financial risk with the bank’s other customers’ financial investments. Your life’s history including past credit record, what you may have to offer to repay the loan to the bank should the proposed venture fail. For the purposes of this research, a risk assessment has been prepared for my hapū to approach foreign investment for a proposed project and is contained in Chapter Four – Case Study One – Restoring the ties. Research of filings with the Securities and Exchange Commission revealed that two corporations, one sole-Māori, the other, a joint-owned Māori and non-Māori corporation had borrowed significant capital from international investors based on their credibility through credit risk and management profiling. One of the corporations had in fact sold shares internationally as collateral for an equity swap (a financial derivative) for a substantial investment through an international consortium. The latter points to a significant milestone in Māori executive leadership and more importantly, their credibility and the reputation of the Māori governance, this on the international stage. *Eighthly*. The elements that describe benefits to justify expenditure of the initiative, their alignment with the hapū strategic and overall responsibilities to create the hapū Business Case was collected and examined and agreed to. A model for hapū

corporate philosophy and strategy and profile was created using elements of the exemplars for they espoused tikanga in all aspects of their relationships.

The ninth and final part. Their attainment of prominence, respectability, recognition and maturity of the Māori corporate executive in world-wide trade context called for a need, of the best tools to support them in executing their mission-critical functions. Hence the creation of He Patai©, loosely translated as “What If?” That query made by a human would firstly be validated to ensure readability prior to generating complex data scenarios with options and recommendations in which to make sound business decisions. The functionality for the ES was conceived, functionally described, then architecturally designed (both physically and logically (computer software)) by Foundation to be constructed with an implementation roll-out timed for the competition of this thesis. This is an ongoing transformational process in that members of the hapū and supported by the Kura Kaupapa Māori students will be trained by the Foundation as Knowledge Engineers responsible for the conversion and support of mātauranga-a-hapū in the Information Sciences. (The inclusion of the hapū students at both Kura Kaupapa and Kohanga Reo levels is to introduce them to entrepreneurship as well as the Information Sciences to promote literacy and numeracy up to the advanced level of mathematics and an internship to support the hapū ES and AI.)

Chapter Four - Case study one. Creating the Sino-Māori cross-cultural knowledge base that contributes to the delivery of sustainable equitable decisions. The upholding of two essential ingredients being Mana and *Ren* as described in the Analects as, “wishing to be established himself, seeks also to establish others.” This being referred to as the apex, or crux of this research’s objective.

Outside of peer-reviewed sources, this research proffers contextual knowledge from the Courts of Record that has enhanced Māori property acquisition rights. The sources were from a non-Māori who by speaking Māori and by extension, comprehending Tikanga Māori, uncovered

new funding source previously withheld for assorted reasons. The Late Judge David Ambler (2008) pressed for, and obtained in the forms of assurances from commercial banks that family owned land, subject to the possible conditions within the Trust deed (that could be varied by consent from a whānau), be used a security for loan monies. Other contextual information (but with significant importance to this research) was gathered at iwi leaders' forum such as the concept of 'organic' tikanga or, the interpretation of tacit knowledge (Polanyi, 1966) by fellow Information Scientists (both exist in Tikanga Māori and Confucian Virtue). The Knowledge base includes cross-bedrock philosophies, Trust Deeds, hapū centric legislation such as the Post Settlement Governance Entity (where applicable), Aotearoa New Zealand Legislation, and embedded Business terminology (validated by Tikanga Māori). This case study will be developing the conceptual framework (algorithms) to manage Trusts and their relationships based on core competencies developed by Prahalad and Hamel (1990).

The People's Republic of China is not only the world's second largest economy but importantly, it also stands for this country's largest market for goods and services. Their success is attributed to two proven facts: low-cost production methods, and an industrious workforce that produces high quality and attractive products for western consumers. Those facts were gleaned from commercial literature and seen by this research during a month-long study visit to the PRC in addition to Malaysia and Singapore whose major corporations are owned by Chinese investors. The professional assignment to the major Chinese conglomerate in Taiwan gave me a first-hand view of the practical application of Confucian principles in action. In Aotearoa New Zealand, every Māori-owned business from the smallest tourist operator and food services owner to the billion-dollar corporations state categorically the assertion of a tikanga based approach. That extends to how they operate and view their clients and employees. Those two facts also prompted the need to develop the conceptual framework to accommodate the Sino Māori trade relationship based on both underlying philosophies. But

there may be a major catch: hapū would need to adopt a form of *modernity* that included accepting *capitalism* and *scientific rationalization* in their trade relationship through a form of cultural hybridisation described by Uz (2014).

Again, this research draws heavily on the seminal and prolific writings on Confucianism and business by Low (2001, 2002, 2005, 2006, 2010a, 2010b, 2011) and in collaboration with Ang and Low (2012, 2013a, 2013b). Corroborating Chinese data and counsel came from the Foundation's trustee, a business practitioner based in the PRC and educated in New Zealand. By good fortune, a Cantonese/Mandarin speaking former New Zealand trade diplomat provided the erudite perspective on the culture and trade, particularly in negotiating techniques and where Māori can by using its unique and creative leadership and historical knowledge to their advantage.

It is of import to this research that while hapū accepts that while fellow Kiwi exporters pursue cultural homogenisation (Albrow & King, 1990) as the norm, its own exporter will implement a hybridisation strategy where applicable such as (Sino-Māori), and adopt an 'organic tikanga' approach to foster trade with all others. The hapū ES, He Patai© will recommend on demand, the proper strategy based on published and unpublished data from its database.

Chapter five – Case study two - the corporate AI tool

The Return on Investment (ROI) is a performance measure used to evaluate the efficiency of an investment. In the executive suite that 'investment' could be better hiring practises or new and improved tools that make efficiencies. Based on the two needs of strengthening the corporate institution and merging cultures, this research has the appropriate expertise to create that capacity in AI. It is a major investment that no other tool could provide the mission critical synergies for the Sino-Māori business framework. The knowledge available in the ES and the

logic of AI to handle idiosyncrasies inherent in mātauranga Māori and Confucian virtues will be created by Foundation in conjunction with the human resources provided by the hapū client. It is built from scratch by technicians trained in collecting the artefacts of the two underlying philosophies. It is in essence, a tool created that addresses the Tino Rangatira principle of Kaupapa Māori as espoused by Graham Hingangaroa Smith (1997), Taina Pohatu (2005), Kuni Jenkins and Leonie Pihama (2001).

Chapter six – The findings and discussion

Often referred to as the soul of any thesis, findings from the research are presented using thematic analysis and triangulation to verify data received whether by qualitative or quantitative methods. Each part of the chapter will be themed by the research questions.

Talking points used as discourse is a statement that will be presented to inform and give voice to the participant's points made during the one-on-one dialogue in conjunction with the analysis and synthesis of documents reviewed to support the case studies alluded to in the earlier chapters.

The end-product or deliverables are the manifestation of the preceding events that were tested as the proposed calculi from the evidence to support hapū in leveraging the power of matauranga-a-hapū in negotiating international trade, as being both transformative and liberating.

Chapter seven – Conclusion

This chapter will look back on the research undertaken to find potential areas for further investigation and their implications for new findings particularly as more advanced IT and IS techniques and newer platforms are generated and implemented out of the research laboratories. Cross-cultural trade ties are expanding existentially especially now that the PRC and other major non-Westernised countries including Māori are becoming major traders. While

the primary purpose of this research was to support Māori exporters to the PRC at the institution levels there was an urgent need to resolve fundamental issues to reinforce the underpinnings of the present-day Maori society. The primary cause being the alienation of land leaving only five percent of the land in New Zealand is Māori land by imperialism and colonisation. That effected the ability for Māori to support their livelihoods. Today, matauranga Māori (Smith, 1990) shows the power, strengths and the potential that each iwi possesses as co-equal partnership with the Crown under the auspices of te Tiriti o Waitangi / Treaty of Waitangi, to trade nationally or abroad.

Chapter summary

This chapter articulated the frameworks that incorporate the guidelines of achieving resolution of the fundamental issues towards creating entrepreneurial opportunities for my hapū.

Chapter conclusion

In this chapter my thesis proposes a pathway to support Māori exporter governance to negotiate and succeed in the complex marketplace of the PRC. What distinguishes this approach to previous Māori scholarship is that it breaks from the conventional Western methods of establishing trade practises by adopting a highly complex hybridised approach used by non-Westernised civilizations. It examines what makes finding and working within instances of epistemology and ontology and axiology, especially where these elements may overlap. This is no mean feat hence the offer of the AI cutting-edge tool in He Pātai© underpinned by heuristic knowledge, that is formed from taonga tuku iho and mātauranga with the bedrock knowledge of tikanga provided by the whānau, hapū and the marae to uphold the whakatauki in Mead (2003) that reads: Ngā Ahi E Ngiha Mai Nei or The Fires That Flare.

CHAPTER TWO – The Literature Review

Introduction

He whakatauki

Tē tōia, tē haumatia

(Nothing can be achieved without a plan, workforce and a way of doing things.)

A Confucian Quotation

我们可以通过三种方式来学习智慧：第一，通过反思，这是最崇高的。其次，通过模仿，这是最简单的；第三，经验，这是最痛苦的。

(We can learn wisdom in three ways: first, through reflection, which is the most sublime; second, through imitation, which is the simplest; third, experience, which is the most painful.)

Purpose and scope

Peer-reviewed business journals (Mika and O’Sullivan, 2014; Harmsworth, 2009; Barlow, 1993; Marsden, 1988; Spiller, Craze, Dell and Mudford, 2017; Dell, 2017) formulated conceptual and theoretical frameworks that Māori could engage in social entrepreneurship (Schumpeter, 1991).

To utilise practitioner experiences for this PD research my focus was on the exemplar hapū/iwi owned exporters with multi-billion dollars in assets that are trading with China. But despite the history of Sino-Māori trading no peer-reviewed data was available, only contextual sources¹⁴ from the iwi or a combination of iwi, hapū, whānau trusts and foreign ownership such as Miraka, and the central government. Therein lies the limited scope of my literature pool for

¹⁴ Ngāi Tahu Holdings, Miraka, Wakatu Corporation and Tainui Group Holdings annual financial reporting and iwi statements to business publications.

this review. (From the business support perspective however, those sources of data are the only kind that banks, or investors would accept to underwrite multi-million-dollar loans. The size of loans precludes traditional sources such as family or New Zealand based merchant bankers. That is collateral underpinned by sound management.)

To develop a Sino-Māori AI calculus based on cross-bedrock philosophies

Through critical analysis of peer-reviewed scholarship, the research objective seeks to identify strengths and weaknesses and to also uncover that which was not written. Any ‘gaps’ would be theorised to develop new concepts, terms and activities forming the ‘new body of knowledge’ that also must be applicable and publishable. The target beneficiary of this mahi is the governance or executive entity and their operations research support group for the current multi-million-dollar Māori export corporations.

Describing the thesis’s normative, descriptive and formative approach

This narrowly focused search parameter group is needed to develop an effective decision-making calculus. For the thirty-five-year Information Technology (IT) we developed Management Information Tools (MIT) that informs the executive decision maker. Then, on assuming a CEO¹⁵ role outside of IT as well as serving concurrently on the board¹⁶ (of directors) for a Vancouver Island, BC First Nation’s multi-million-dollar corporation, I saw the urgent need for an AI, ANN and Algorithmic augmented MIT capacity. Why? Simply, because

¹⁵ Of an island based First Nations community of 1,800 in BC Canada. As CEO, responsible to the Canadian Federal Government and the Chief Councillors for implementing policy. Responsible for hiring personnel for the following island infrastructure: tribal administration, safe water treatment management, primary school board staff selection, emergency services including health clinic service, fire and ambulance services, seaport and air services facilities, and supporting island entrepreneurs in marketing their fish. As a remote community in Canada, responsible for implementing bad weather contingency plans. Annual budget \$CAD 18,000,000.

¹⁶ Board member of the Khowutzun Development Corporation of Duncan, BC. Major market gardening, Tourist Convention Services, Tribal social services, retail services landlord, and Casino owner. Regular meetings held on Vancouver Island, BC.

successful decision-making had advanced so rapidly and needed access to mission critical, real time *information* not *data* from a conversational, interactive computer tool. These were real corporations paying employee salaries and benefits as well as federal and provincial taxes. Just as important was paying dividends to its tribal members who could aspire to wealth creation - recreating a history of gathering food during the bountiful summer months to enjoy at the *potlach*¹⁷ during bitter cold winters.

Supporting Māori exporters today

What is involved? Today's corporations have significant investment in financial capital, human resources and assets that become part of the risk in the decision-making process. Moreover, today, in the Sino-Māori partnership there is something even greater at stake: *mana* (prestige) and the Confucian virtue of Pinyin: *Ren Chinese*: 仁 defined as, “wishing to be established himself, seeks also to establish others; wishing to be enlarged himself, he seeks also to enlarge others.” Only AI can deliver on that heavy burden, and therein lies the nub of this professional doctorate thesis project.

Supporting the governance and executive roles

Each day, the multi-billion-dollar hapū export corporations must deliver sustainable, equitable decisions 100% of the time. To support governance and executive, the literature to be reviewed must proffer the following:

- relevant bedrock philosophical underpinnings
- customary laws to apply to the facts
- identifiable ‘exceptions’ and ‘tacit’ elements

¹⁷ The potlach is a ceremony practised among First Nations and Native Americans in the Northwest coastal regions of Canada and the US.

- identifying tool(s) to deliver solutions expeditiously based on the above findings
- benefits and risks of tools to accomplish governance deliverables
- if AI is to be integrated into the management suite of governance tools, then there is the need to apply relevant mathematical structures and the concepts of the data sciences to the disparate units of data to the tool(s) that create the executive information
- make tikanga Māori/customary law adjustments to all business principles (with footnotes¹⁸)
- formulate the appropriate responses including perceived anomalies to the “what if” inquiry message to AI.
- transit management from the ‘white board & marking pen’ to ‘interactive’ strategic planning that delivers business intelligence, a set of methodologies, processes, architectures, and technologies that transform raw data into meaningful and useful information.
- to create within the rūnanga the incentives¹⁹ to drive the hapū economic plan.

A proposed specialised Kāhui role within the hapū export corporation

The efficacy of the machine learning algorithms in AI is dependent on mātauranga Māori data consistencies, completeness and correctness as part of data integrity. (This research has identified the skills and competencies for that function to be discussed in the Case Study Five – AI Architecture.)

¹⁸ Using Information Sciences ontologies/sub-ontologies, to assign weighting 1-5 factors denoting level of severity (based on tikanga). An AI dictionary will be populated using footnotes for exceptions processing to ensure Tikanga/Confucian produces sustainable equitable decisions. An explanatory message in Māori or Mandarin Chinese will be delivered to the CEO PC/Tablet or Cellular phone with an explanation for the ‘exception’ processing.

¹⁹ fair market compensation, transparent human resource selection (nepotism?) and tikanga adjustment that meets the mission and vision statement i.e. hiring temporary external management that would also mentor hapū rangatahi.

This section examines published literature that is relevant to the two research questions. I will also scrutinize real and tacit data (Polanyi, 1966) as a puzzle to be solved using mathematics and data science principles towards encapsulation. This programming technique creates a new single entity from multiple disparate elements. Every data point²⁰ jointly and severally, serves the purpose of examining two essential elements to this thesis being the two bedrock philosophies: Tikanga Māori (Mead, 2003) and Confucian Virtue (Low, 2011). What distinguishes each is that tikanga Māori is uncodified (for the purposes of AI) Māori Customary Law and a component of Mātauranga Māori. Whereas, Confucian Virtue has been codified as The Analects (Yu, 2014). Both will be codified for AI purposes and formatted to meet the strict needs of knowledge reasoning by AI to always deliver the sustainable and equitable decisions.

(Personal²¹ executive and governance experience in cross-cultural business has developed the business decision thought processes (algorithms) for that commerce through unique lenses of Treaty partnerships²² that have national and political implications.) This experience must also contribute to this research processes. Why? Two simple examples; kaitiaki and whanaungatanga (Mead, 2003) – the latter strives for the long-term relationship (the foundation of any cross-cultural accord) whereby, a former colonial power may not subscribe to either (this is expanded later in the section dealing with Māori as a Treaty partner, such as not being at the negotiating table during the China New Zealand Free Trade negotiations). Not to be forgotten²³ is the personal experience of viewing cross-cultural experience first-hand from

²⁰ Discrete units of information to be read but not changed. To be represented numerically and/or graphically.

²¹ While under the New Zealand Social Sciences guidelines personal experiences cannot be used in the literature review, it is used here as the professional doctorate permits their use and for reasons of Tikanga Māori. Experience trumps theoretical framework thinking to arrive at this conclusion. Why? This is based on real and actual business thought processing for decisions are based on an accumulation of facts. Ignorance causes failure that no multi-billion-dollar enterprise could survive - tikanga Māori trumps all thinking including arbitrary guidelines. Only the smartest survive in the real world. The word of the business executive who runs a multi-billion-dollar during data collection overrides theory without practical experience.

²² As Māori, our narratives of water 'Ko wai mātou' or we are water are different to that of our Tiriti partner.

²³ Again, the personal experience is used here for it's a common business train of thought and guided by tikanga Māori.

within a Confucian Philosophy based Chinese corporation who with its unique cross-cultural relationship, used several versions of hybridisation theory (Uz, 2014) to support trade with over forty-two countries on a worldwide basis.

Defining the supporting research objectives

A model for the hapū business enterprise

In the journal article by Harmsworth (2009) and a diverse group of Māori academics advanced several key organisational characteristics to form an ideal trading entity for the future. That call included the hiring of Māori at various levels, to have a distinct Māori ‘style’ of governance and management that focuses on kaupapa Māori. A tikanga framework was articulated to guide the governance and executive components with the principles of tikanga, whanaungatanga, manaakitanga, kaitiakitanga, tino rangatiratanga, and wairuatanga. Their combined ‘vision’ and ‘mission’ statements were expressed this way:

[I]n that the enterprise must be effective nationally and internationally, to operate in a bicultural way that should not ignore established global principles . . . to achieve Māori aspirations related to whakaritenga (balanced motives), of looking beyond the profit motive to culturally based motives such as heritage (for land-and-sea-based industries) as well as social and political motivations.

One strength of this proposition is the use of established Māori principles. This acts as a gauge, that establishes benchmarks to monitor performance. Another is biculturalism also establishing mutually beneficial rules for negotiation as expressed by Chief Judge Sir Eddie T Durie in (Durie, 1994; p. 449). While not viewed as a weakness, the ordinary meaning of the word bicultural means ‘combining cultural and customs of two nations.’ Therefore, logically, any or

every partnership is deemed bicultural? While ‘global principles’ were not defined or articulated, the implications alone would create a dispute resolution mechanism to support a trade pact. Mason Durie (2005) proposed a generalised Māori business framework derived from adapting a ‘mainstream’ business model. The objective being to,

help ground the concept of what constitutes a *Māori centred* business in relation to Māori development and advancement.

It also helps define what is meant by the *Māori economy*.

The two concepts of *Māori centred*, or *Māori economy*²⁴, are defined as being local within in Aotearoa New Zealand and contributing to the nation’s wellbeing. What is of interest is how it can be delineated from a so called ‘mainstream’ model based on the following:

a) generally, a business (Schumpeter, 1991) is defined as commercial activity where goods and services are exchanged for one another and/or for money. Three ingredients are needed: investment, a needed product and customers to make a profit. Question: if the commerce is to be centred around Māori only, will it be viable? Would barter be acceptable to purchase raw material? Would the financial institutions accept anything other than hard currency as collateral for loans? Adapting the concept of ‘mainstream’ business model places fiscal and monetary constraints on commerce. One solution would be to create Māori-only (although I viewed that as being discriminatory) institutions, requiring a central government policy change as it will certainly involve funding by taxes.

b) An economy is defined as the state of a country or region in terms of production, consumption of goods and services and the supply of money. The metrics that would constitute a ‘Māori Economy’²⁵ are also not available so, that would preclude its definition.

²⁴ Defined as agriculture, forestry, fishing and mining

²⁵ Generally, the Ministry of Business Innovation & Employment (a government agency) combines all statistics and reports as the New Zealand economy. ie Tourism figures and earnings are reported as combined.

The importance of connecting of culture to business (Barlow, 1993; Marsden, 1988; Mead, 2004) cannot be overstated, and underpins the argument by Mason Durie (2005) that:

[i]t, lies at the heart of many Māori businesses, and the cultural concepts and helps guide an enterprise towards a vision and principles, as well as planning and implementing strategies for Māori development and advancement.

The consolidated teaching points from Harmsworth (2009), are thus:

[M]aori must achieve market share and export growth . . . sharing common values with the host nation . . . to understand their culture, protocols, language . . . to align with Māori cultural values . . . networks are important for Māori to sell, products and services, access to other countries . . . access to experts well versed in all aspects of Māori lore and culture.

Determining the scope articulated for the above requirements requires the analytical and planning tools of Knight (2005) and qualitative sample sizing (Cavana, Delahaye and Sekaran, 2001: p. 279; Sekaran, 2000: p. 296-297 and Roscoe, 1975).

While believing the journal article to be aspirational, this research asserts that its own hapū proposed business kāhui would need to examine every core business principle used in its own decision-making to ensure its compliance with tikanga principles. This assertion may be alluded to in Mika and O’Sullivan (2014) who penned:

[D]ifferences in approach may be influenced by several factors including: tribal differences; the nature and purpose of the organisation; the nature of the assets under management; tribal differences; the nature and purpose of the organisation; the nature of the assets under management; the locality; and the strata of Māori social organisation . . . some form of management is universally implied within the make-up of Māori organisations, the precise style (principles,

process and outcomes) will vary.

What is not written or expressed contextually is the degree to how ‘principles, process(es) and outcomes’ that are nominally classed as variables, are adjusted to meet the individual needs for there is no universal formula or description that is written across whānau, hapū or iwi grouping. For example, each hapū unit may consider itself as being autonomous; having a hereditary (whakapapa based) or merit-based hierarchy? If so, how is the principle of rangatiratanga resolved? In terms of guardianship/ kaitiakitanga, would a business decision to sell water help or hinder guardianship of the environment? Another being the Return on Investment (ROI); using Creswell (2009) would determine whether to invest in the speed and efficiency of technology such as AI or, continue deploying manual labour with pencil and paper. While protocols and kawa for inter-tribal commerce (Petrie, 2006) were Kaupapa Māori based, what new kaupapa Māori elements would be added to allow partial or full foreign ownership to its hapū owned export corporation as trade partners in the export model? Why? The hapū corporation would definitely need a major injection of capital investment to expand or indeed, to survive. What if there is bankruptcy? Another challenge derived from the aspirations was funding in general. Today’s sources, involve a variety from banking, private financial institutions both local and abroad, types of securities required and the limits? What if the business capital needs exceed that of all today’s sources combined? Borrowing abroad of major capital (Vinamilk Invests in Miraka, n.d.). Historical records show hapū tūpuna (Petrie, 2006) were successful exporters to Australia during the 1860’s. Each used various sources from mortgaging their vessels to using ‘hedging’ techniques that bet on the receivables or the sales of their pork, vegetables, milling flour, flax and other commodities. Question: did they use European law or whether (the then) customary law had built-in organic processes during their

offshore experiences to meet offshore capital needs?

Defining traditional leadership roles

Traditionally, tikanga Māori leadership was decided by virtue of being the first-born male from the chiefly lines of descent. While this may reek of nepotism by today's standards, there are instances where leadership roles could be acquired through 'force of character'

(Firth, 1973, p. 108), or a proven talent or as the unwillingness (or inability) of one to

assume inherited status (Mahuika, 1992, pp. 43-45). Cited in Mika and O'Sullivan (2014).

Defining Māori management

In Mika and O'Sullivan (2014) define 'Maori management' as

Systematic action-oriented deployment of resources by managers of Māori descent and within a Māori world view to achieve purposes which are meaningful and of benefit to whānau, hapū and iwi and Māori communities in terms of both means and ends which may be conducted within both Māori and non-Māori contexts. Fundamentally, our definition suggests that whakapapa and a Māori world views are necessary elements for there to be Māori management. That is, our manager has to be of Māori descent for the activity which they undertake to be described as Māori Management. This does not negate the adaption of Māori management practices by non-Māori organisation.

The stated strengths are that a manager must be of Māori descent in order to be defined as Māori Management and that non-Māori may adapt Māori management practises. What is not written here is how a tikanga Māori solution is applied to the whānau, marae or hapū business in a case of malfeasance? How would the perpetrator be sanctioned? How would any

restitution be made? By consensus of its shareholders, then a declaration by their rangatira? Research asserts that tikanga Māori does have within the principle of wairuatanga, best practises derived from customary practices and spiritualities that are handed down from one generation to the next. There was no glossary or a full explanation defining exactly what is ‘Māori Management.’ There was no vision or mission statements while a value statement would be assumed in Mātauranga Māori? The adaptation by others is certainly a valid aspiration when viewed from a cross-cultural perspective.

Defining the functional roles of a Māori Management Model

Mika and O’Sullivan (2014) suggest using their table that describes a distinctive Māori approach to management in respect to planning, organizing, leading, and controlling.

Planning	Organising
Consider future generations Pursue social, cultural and economic objectives Incorporate past, present and future.	Adapt and apply available resources Consider whakapapa when assigning roles Deploy resources based on tribal priorities
Leading	Controlling
Seek concensus through hui Balancing traditional and modern leadership Legitimize role through whakapapa and mana	Māori values and customs as standards Accountability to whānau, hapū and iwi Sanctions and solutions collectively agreed

The authors advance the strengths this way, “fine Māori management effectively integrates Māori and Western management theories and practices to achieve Māori defined purposes within Māori organizational settings.” To support the planning aspect, both authors cite Waitangi Tribunal (1999, p.12) of which an excerpt is presented here as, “the principles of language is a taonga, people are our greatest resource, marae as principal home of the iwi, and the principle of rangatiratanga.” In following the thematic support for this research’s objective under organisation was “the adaptation of Māori and non-Māori resources . . . new technology (Frederick and Henry, 2004).” The assumption here is that AI could meet the definition in this category of innovative technology?

Defining Māori Economic Activity

The Te Puni Kōkiri report titled The Māori Economic Development Taskforce (2010a) describes activity as individuals being self-employed or marae, hapū to iwi and to pan-tribal commercial activities. Another report, The Māori Development Taskforce (2010b) expressed “the need for iwi to engage with government in the development of models of joint or co-investment arrangement with the Crown.” The perceived weakness of both reports is the lack of specificity. In the second proposition of joint activity and co-investment, however, shows the promise of cooperation although recorded skepticism is outlined further on in this chapter.

Regional economic development plans for our Iwi/hapū

The policy outline makes future promises towards economic independence or self-sufficiency as a fundamental principle for Māori. Programs promised include assistance towards land

utilization and productivity alongside skills improvements particularly with the poorest whānau (Tai Tokerau Northland Economic Action Plan (2016)).

Have the Crown/Māori Treaty partnership roles changed or evolved?

The formal (NEW ZEALAND FOREIGN AFFAIRS & TRADE MANATŪ AORERE, 2008) trade pact²⁶ between China and New Zealand was concluded by the Fifth Labour Government in 2008. It brought liberalization and the ease of trade in goods and services, and improvements over a broad range of economic areas. It also established rules for their regulators and officials to work more closely together to create a secure trading relationship. The proceedings from the first Trans-Pacific Partnership (TPP) hui (Beehive.govt.nz, 2016, March 10) outlined the opportunities and gains that would accrue to Māori in forestry, fishing, red meat, and dairy. The legal standing²⁷ and responsibilities as Treaty partner are represented as follows:

New Zealand's approach in its free trade agreements reflects the Constitutional significance of the Treaty of Waitangi (TOW) to New Zealand . . . special protection in regard to the Treaty . . . TPP specifically recognises TOW so nothing will prevent the Crown from meeting its obligations to Māori.

Interestingly, the government trade minister trade Mr McClay sought to reinforce in the following quotation:

Every free trade agreement signed by a New Zealand government since 2001 has included a specific provision preserving the pre-eminence of the Treaty of Waitangi in New Zealand.

²⁶ Is the ability of a party to bring a lawsuit in court based upon their stake in the outcome. Need to show connection to and harm from the law or action challenged.

²⁷ Is the ability of a party to bring a lawsuit in court based upon their stake in the outcome. Need to show connection to and harm from the law or action challenged.

Yet, through parliamentary representation by the Māori Party member and Northern Māori member Hone (Harawira, 2008) expressed his reservations during debate on the proposed New Zealand China Free Trade Agreement. Speaking for his constituents he raised Māori objections to the pact that was articulated this way:

[o]ngoing concerns about human rights . . . of dumping goods on our domestic markets . . . weak health, safety and environmental standards . . . poor protection of workers will be suffered by New Zealand workers . . . hundreds of Tibetans being imprisoned.

The member of parliament did, however, offer tacit approval for Māori entrepreneurs to engage and to enjoy trade with China in his concluding sentence.

We fully respect the right of Iwi, of Māori businesses, to take up the opportunity to pursue their own best interests, to return dividends to Māori shareholders . . . prerogative, we are confident they will be competitive and achieve impressive returns . . . trickle down of economic growth. We support fair trade, not free trade. We must know the rights of Māori will be actively protected as provided under the Treaty of Waitangi . . . our laws serve to protect and enhance our nation, not globalist agendas.

What could be perceived as paternalistic may fit an editorial's narrative and is without legal basis (Te Puni Kōkiri, 2002) for the second article (ko te tuarua of the Tiriti o Waitangi and expressed in the glossary section) defines an enduring relationship. Legal scholar Carwyn Jones in (Jones, 2016, April) sees the treaty partner relationship in another proposed Trans-Pacific Partnership (TPP) this way,

The concerns around Treaty rights are not that the TPP expressly forbids the Government (Crown) from fulfilling its obligations . . . but rather it creates incentives to avoid taking any action that might be open to challenge . . . given that many areas of New Zealand law and policy have been found to be inconsistent with Treaty principles, one might have thought the Government would be virtually continuously needing to call on these Treaty exceptions as it strives to correct this. And yet that doesn't seem to have been the case.

A lengthy and comprehensive list of 10 free trade agreements (NEW ZEALAND FOREIGN AFFAIRS & TRADE MANATŪ AORERE, n.d.) is available for scrutiny. The common denominator for each is that a tikanga Māori corporation may need to develop a hybridised framework for trade depending on the composition or partnership²⁸ of the pact.

Is consultation still integral to any relationship, especially on treaty matters?

By highlighting the constitutional significance of Crown/Māori relationship (Waitangi Tribunal, 2016) Maanu Paul, co-chair of the New Zealand Māori Council (NZMC) identifies a breach in the consultative role imposed by statute (Beehive.govt.nz, 2016, March 10):

The exclusion of Māori from the Crown's decision-making process significantly and adversely affects the overall well-being of Māori in Aotearoa, and at the end of the day, exacerbates the long held and continuing distrust between Māori and the Crown. . . insufficient, or no assessment by the Crown of the TPPA's impact upon the guaranteed rights of Māori under the Treaty.

²⁸ Depending on the partnership. A tikanga Māori exporter presents its core belief within the negotiating framework outline. Such principles as whanaungatanga, manaakitanga, kaitiakitanga, and tikanga. A partner would proffer their set of beliefs that could affect the relationship. While mātauranga Māori covers most aspects of trade, the issue of escrow (legal document that ensures payment of debt or, the holding of an asset by a third-party) is an acceptable practise. New exporters may be slighted at the idea?

Key points drawn are the assertion of the nature and extent of Māori interests in a trade pact such as articulating for example, its fundamental principles of kaitiakitanga and protection and the influencing outcomes based on tikanga Maori. Moreover, consultation provides necessary openness and transparency.

The Māori leader further asserted bad faith by the Crown's selectivity in choosing 'who' represented Māori interests. In that same paper Waimarie Bruce-Kīngi of Ngāti Kahu o Torongare me Te Parawhau captures well the frustration at the Crown's engagement over the TPPA: 'we are being told to "go outside and play", while the "adults" talk at the "big table"'.

Skepticism expressed by others on Crown/First Nations of Canada treaty relations

The (Crown) action draws the parallel in Canadian First Nations jurisprudence for the decision in *Delgamuukw v British Columbia* [1997] 3 S.C.R. 1010,

[a]lso known as *Delgamuukw v The Queen* is a groundbreaking ruling by the Supreme Court of Canada "containing its first definitive statement on the content of Aboriginal title in Canada." The ruling also described the "scope of protection afforded Aboriginal title under the Constitution Act, 1982" as well as defining "how Aboriginal title may be proved." It also outlined the "justification test for Infringements of Aboriginal title."

Central to the Supreme Court of British Columbia ground-breaking ruling was the failure of the Crown to consult with its treaty partner. Moreover, the decision created case-law and precedent for indigenous rights worldwide (Kurjata, 2017).

Another perceived difficulty of entering collaborative business relations with the Crown can be explained by Professor Henry Mintzberg, the Cleghorn Professor of Management Studies

at McGill University in Montreal, Quebec who opined in the Harvard Business Review of March 2017 in (Mintzberg, 2017, March 31), that:

Consider this: Business has a convenient bottom line, called “profit,” which can readily be measured. What is the bottom line for terrorism? The number of countries on a list, or of immigrants deported, or of walls built? How about the number of attacks that *don't* happen? Many activities are in the public sector precisely because their intricate results are difficult to measure.

Note: This research did not uncover any joint Crown and iwi business relationships in existence. The search argument was based on business entity where the governance and executive teams was based on iwi or hapū with someone with or delegated by the Crown.

Perceived legislative challenges as viewed by the social sciences

The complexity of contexts, dual objectives, blended environments and organisational forms constitutes unique and diverse settings under which Māori business operates. Contexts adds complexity, but also adds a rich and diverse environment for exploring theoretical gaps and opportunities (Dell, 2017). While the author summarizes Aotearoa New Zealand legislation guiding and protecting Māori assets and further alienation, the perceived weakness is not enumerating the developed strengths of Tikanga Māori that presently holds within jurisprudence, a legal system. Supreme Court judge, Justice Joe Williams (former Māori Land Court Chief Judge) published the following legal opinion (The New Zealand Law Commission, 2002) publication: New Zealand Law Society at NZLII Sec 41, in 1998.²⁹ It refers to the expectations of the Māori litigant in a Court of law.

²⁹ As reported by the New Zealand Law Society at NZLII Sec 41 at http://www.nzlii.org/nz/other/nzlc/sp/SP13/SP13-3_.html

They come to Court, if they are in conflict, armed with the tikanga-based arguments which support their position. Trustees are appointed to administer lands not for their skills, but for their seniority within the leading families. The view of kaumātua will take priority whatever the shareholding of those individuals, and sometimes if those individuals own shares at all.

Responding to perceived challenges posed to the Māori management model

The difficulty for Dell (2017) was creating a ‘neatly synthesised’ one-size fits all theory generalised across all models of Māori management and business examples. The perceived lack or absence of any suitable conceptual or theoretical frameworks suitable to use as a useful lens was the difficulty in theorizing the Māori phenomena and to its relevance within a global academic context. While none could be found, the strength was in the findings that,

Māori management utilising Western-centered methods to guide business, may in fact, be perpetuating Western behaviours, instead of capturing and identifying their own unique practises. Revealing and explicating Māori-centric management phenomena will need to be charted via different ontological and epistemological applications.

A curious finding was the author’s definition of ‘Māori management’ and reference to a ‘Western-centered’ method. The perceived differences between the two are in law (New Zealand legislation as well as Māori customary law), local regulation and customs (tikanga Māori to underpin ‘Māori management’) versus the ill-defined ‘Western-centered’. This research asserts that any hapū exporter should incorporate both approaches. To illustrate that point, this research used Langer (1997) to identify disparate data points for its AI tool to define the exporter (see Figure 3 – The HMMead_Algorithm©.)

Risk types, causes, and remedies?

The control functions in the Māori Management Model (Mika and O’Sullivan, 2014) are, “Māori values and customs as standards for accountability to whānau, hapū and iwi and any sanctions and solutions are collectively agreed.” So, key to their success is (Kaplan and Mikes, 2012) managing risks. To every corporation there are three types, preventable, strategic and external. The first category is unauthorized, illegal or unethical behaviour activity that is not only a breach of tikanga Māori but is also preventable.

Good judgement in fiscal management, compliance with legal or regulatory issues is the expectation of any effective strategic leadership. Another form of strategic business acumen exercised by the Māori corporation Miraka (Vinamilk raises stake in New Zealand’s Miraka Company, 2015) was exercising an equity swap³⁰ to attract substantial capital to meet the far-reaching strategic vision. As an extension and condition to the equity swap, a member of the foreign owned lending corporation joined the board of directors with full voting rights. The company shareholders comprising hapū and various trust boards had approved the transaction thus the tikanga of each was involved and that points to the resilience of the guiding principles. Another large corporation had Mandarin-speaking employees from their own hapū/iwi and based in both China and Aotearoa New Zealand. The action met the tikanga Māori aspect of whanaungatanga / guanxi: another strategic goal. The final type of risk is the external type. That has the potential to be the most severe and have the greatest impact on the control by whānau, marae or hapū businesses. Tikanga Māori expects the management in conjunction with its shareholders/hapū members to have plan contingencies so as to meet the temporal needs of food, shelter and protection.

³⁰ An equity swap is a financial derivative contract where a set of future cash flows are agreed to be exchanged between two counterparts at set dates in the future. In this instance the Māori corporation exchanged shares for cash.

Today, the potential kinds of external risks include famines, foreign wars, financial jeopardy such as the global financial crisis (of 2008) or indeed the Coronavirus-19 as in the year 2020. For all risks, Tikanga Māori teaches us about consensus through being unified and collective towards the goal of goodwill, patience and free from time constraints.

Making executive transitions work: following trends

While current decision makers will use their ‘white board and marker pen’ surrounded by numerous experts, advisors and consultants to formulate decision making, Rob Marvin (2018, November 13) highlights current trends among multi-million-dollar, real-world businesses. An earlier sub-chapter articulated several risk factors with the consequences, deemed fatal. The management of trends/risks articulated by Marvin may result from the ‘bounded rationality’, as prescribed by Simon (1991). They are tractability of the decision problem, limitations of the mind and the time available to make the decision. This cross-cultural nature compounds the Simon hypothesis requiring the following: ‘hands on’ knowledge of cross-bedrock resolution, legal and legislative matters, business principles, internal capability gaps³¹, and on occasion, some external support. To support the executive during the transition to meet these exigencies, the support group of kāhui and Operations Researchers will develop business scenarios described earlier. Precise and cumulative ‘exceptions’ will be added to these scenarios that are converted to AI ‘scripts’³² to be uploaded to the corporate AI decision-maker. The concept and role of this testing methodology has a tikanga basis as described in Mead (2003; p.12) this way:

tikanga is defined as tools of thought and understanding . . . packages
of ideas which help to organize behaviour and provide some predictability in how
certain activities are carried out . . . providing templates and frameworks to guide

³¹ Mātauranga Māori, Confucian Virtue, bi-lingual capability, hapū centric and national legislative,

³² A format that converts human language texts to AI machine readable text. Utilised by this research’s owned prototype AI platform called He Pātai® incorporated under New Zealand Legislation as He Pātai AI Systems Limited© 7821762 with NZ Business Number 9429047830158.

actions and help steer . . . actions and help steer . . . people and differentiate right and wrong . . . right and proper way to conduct one's self.

AI will respond to every 'What if?' query in three ways: information to support her/his executive decisions with option(s) and or footnotes; data to the kāhui/researcher in the form of projections with an error/explanation message to both recipients. To underscore, management uses information to create business decisions; whereas kāhui is responsible for the integrity of the internal data information in their support role.

Modernity, Capitalism and Scientific Rationalism

Uz (2014) writes that China had created their successful business model by adapting a set of three principles of *modernity*, *scientific rationalisation* and *capitalism*, through, a specific interpretation of modernity as an assimilation to the Chinese culture itself – rather than the mirroring of the West (Hamilton, 1994). The strength of this move is that politically, China is still described as a People's democratic dictatorship and expressed in Pinyin: Rénmín Míngzhǔ Zhuānzhèng. A phrase that is incorporated in the Constitution of the People's Republic of China. Yet, the irony is that their merchants and business executives use capitalist principles to produce high quality consumer products at a competitive price to appeal to the western capitalist societies' consumers. The reason why these three principles are mentioned is that in a TPK document (We review in the discussion chapter) that there is some objection to using the word enterprise or the hint of 'capitalism' or of the word 'profit' in some circles surrounding Māori small business.

(Earlier in this thesis mention is made of a request by Dr Ngata on the subject of defining the principles of Power and Wealth within the intra-iwi organisation. This research was unable to

undertake Discovery (law) due time constraints. The brief at the time of the request suggested these principles as a basis of the conflict hence the mention here.)

Creating the impetus for small businesses at the whānau and marae

Encouragement to change the status quo and aspire was answered by Freire (1983, p.11) in the “Pedagogy of the Oppressed” when it was written that, “a person who could not read was no less intelligent than a person who could read, they were just a person who had not yet learnt to read.” More encouragement came at Freire (1983, p. 21) who articulated that

[e]ducation is the greatest medium for change in all societies this way
. . . to liberate themselves and their oppressors as well. The
oppressors, who oppress, exploit, and rape by virtue of their power, cannot
find this power the strength to liberate either the oppressed or themselves.
Only power that springs from the weakness of the oppressed will be
sufficiently strong to free both.

The fundamentals of Freire’s pedagogical methods concerning education is to heighten the student’s level of consciousness of the world around him/her, while at the same time learning to read. According to Whitehead and Annesley (2005), education is the most significant contribution to Māori economic development and likely to improve the skills of Māori people. Authors Kuntz, Naswall, Beckingsale and Macfarlane (2014) draw attention to the five core Māori values of manaakitanga, whakawhanaungatanga, wairuatanga, auahatanga, and kaitiakitanga, as being central to a culturally responsive workplace (Mead, 2003).

Māori Epistemology

Bawden (1991) and Creswell (2003) explain epistemology this way: it is a way of knowing and understanding and instigated through culture, history with or without religious beliefs; of knowing the world through lived experiences and realities.

Aotearoa based researchers Black (2012) and Doherty (2012) assert that mātauranga Māori is scientific knowledge, an *episteme*, (a term derived from the French word *épistémè* used by the French philosopher Paul-Michel Foucault (1926 – 1984)), of how Māori know what they know.

A body of knowledge that links customary, modern teachings and philosophies and as a theoretical or practical knowledge acquired through and education and/or experience.

Doherty (2012, p. 65) articulates a framework to show that mātauranga Māori, mātauranga-a-iwi and kaupapa Māori theory are distinct but inseparable entities for several reasons including the survival of language, knowledge and culture. It proposes the following term, ‘generic knowledge’ that encompass (non-Māori) epistemologies and concepts. The strengths that I take is from the author’s tribal (Ngāi Tuhoe) history when describing how Elsdon Best (1941) found it,

difficult to rationalize Tuhoe history from his perspective . . . was relying on the *Pākehā* lenses to understand elements of Tuhoe epistemology and, because he was unable to comprehend it, he marginalized, diminished it as an absurdity.

Marie Battiste and James (Sákéj) Youngblood Henderson (2003: p.36) highlight the dilemma of having a non-indigenous theoretical base explaining what is indigenous knowledge, being difficult for non-European is to comprehend because Eurocentric thought has created a mysticism around indigenous knowledge that distances the outsider from indigenous peoples

and what they know (cited by Doherty, 2012: p.69). Wiri (2014, p.200) expresses the subject of mātauranga Māori this way:

Māori epistemology; the Māori way of knowing; the Māori world view; the Māori style of thought; Māori ideology; Māori knowledge base; Māori perspective; to fully understand the Māori world; to be knowledgeable in things Māori; to be a graduate of the Māori schools of learning (whare - wānanga); Māori tradition and history; Māori experience of certain phenomena; Māori enlightenment; Māori scholarship; Māori intellectual tradition.

Kaupapa Māori

Kaupapa Māori theory was developed by several well-known Māori academics (Smith, L. 1995; Smith, G. 2003; Pihama, 2001; Bishop, 1999; Irwin, 1994). Kaupapa on the other hand has been developed by Māori scholars in the last thirty-five years from (Nepe, 1991) who stated that it is derived from distinctive cultural epistemological and metaphysical foundations. Linda Tuhiwai Smith (1995: p. 8) explains it this way, “the concept of Kaupapa implies a way of framing and structuring how we think about those ideas and practices.”

Nepe (1991) declared that Kaupapa Māori is a conceptualisation of Māori knowledge. Leonie Pihama (2004) argues that Kaupapa Māori is not new but has the foundations that reach well beyond the colonisation of these lands. Where previously in Pihama (1993; p 8) opined that:

In the New Zealand context, distinctive modes of theorising have emerged from Māori Communities, which have a common element the validation of Te Reo and Tikanga Māori. These movements have been framed under a range of broad terms, ‘Tino rangatiratanga’, ‘Māori Sovereignty’, ‘Māori perspectives’, and ‘Kaupapa Māori’. These modes of Analysis and theory are by no means contemporary phenomena.

Kaupapa Māori theory supports the idea that the outsider approach to research does not work when working with Māori people due to Māori distrust of researchers. Add to that their inability

to correctly understand certain behaviours, the possibility of missing certain nuances which do indicate issues of importance and the inability to relate to the participants (Smith, 1997, pp.14–18).

Kaupapa theory is the underlying concept or philosophies based on Tikanga Māori that has been developed and proven for centuries and based on fairness and equity consistent with Māori values (Mead, 2003). Tikanga has a wide range of meanings – culture, custom, ethic, etiquette, fashion, formality, lore, manner, meaning, mechanism, method, protocol, and style. Graham H Smith (1997) and Linda Tuhiwai Smith (1995) advocate that a kaupapa Māori approach makes good business sense for it guarantees integrity and honesty. Moreover, “it underpins strong employee engagement that builds lasting relationships with our clients, delivering safe, consistent and timely operations.”

Since the mid-20th century there has been a resurgence in developing scholarship of mātauranga Māori by both Māori and non-Māori (Professors Dame Anne Salmond and the late Professor Dame Judith Binney as two examples) researchers. Bishop (1998) writes that it is our way as Māori to understand the world. During that same period others (non-Māori) have tried to delegitimize the findings of that research (Mikaere, 2003; Pihama, 2001).

Tikanga Māori

This research draws heavily on Mead (2003) as the authority on the subject of tikanga for it outlines structures, sets of values, systems, roles and protocols for leadership whether on the marae or, presumably in the corporate governance of the Māori owned enterprise. It creates the norms, customs, practices, and lore to be adhered to by Māori in their daily lives and implores

governance to capitalise on its leveraging powers as a tool to negotiate the complexities of external trade negotiations. Mead (2003) makes it very clear that

[t]he key point here is that the (framework) proves *a* position and not necessarily *the* position, the dynamic aspect of tikanga Māori. A range of variables that impinge not only how tikanga is interpreted but also, its practice, subtle and sometimes major changes are introduced every time a tikanga is practiced.

That distinction of an ‘*a*’ and ‘*the*’ (tikanga) position has not been lost in the Courts of Law. Judges have (Milroy, 2007) deferred litigants of tikanga-based arguments to find resolution on the marae for arguments based on ‘lore.’ Should there be no tūranga-waewae, where we as Māori feel empowered and connect, then the Courts, would impose rulings based on case-law and precedent underpinned by current New Zealand legislation, and in line with the various judicial guidelines.

Adding ‘he hunga tiaki’ to tikanga Maori as tikanga-a-hapū in a temporary/consultant role

The Te Arawa Tribe’s Guide ‘Bubbles’ (Mihinui, 2002) of Rotorua used the term ‘te hunga tiaki’ as all encompassing, rather than kaitiaki, as the word ‘kai’ infers food. The hunga (group) as a separate entity is also linked up with a,

sense of communal responsibilities . . . invokes ideas of obligation to offer hospitality, but also to manage and protect with the implicit recognition of the group’s mana whenua [customary authority over traditional] role in this respect.

A proposed *ad hoc* or temporary sub-committee has a role in what Mika and O’Sullivan (2014) described as the Māori management’s³³ need for comparative analysis between Māori and Western management theories. This research asserts that this is not a static role and is imperative when considering multi-billion-dollar decision making. The entity uses analytical, logical and systematic methods to complement the tools used by governance. The purpose being problem-solving/decision-making helpful to the hapū governance and executive when resolving numerous issues. The group would use advanced mathematical and analytical skills for budgeting, forecasting, planning future growth, seeking new commercial ties and innovative technologies to support the governance function. An example is should governance consider entering into a strategic partnership to further its vision and mission statements. Would it merge with another business or acquire it outright? How much would it cost? Where to obtain funding? How would it meet the Tikanga Māori principles of Kotahitanga if attrition of the work force becomes an issue? Some decision makers may argue that the task be outsourced to others. The question then becomes whether they the consultant group would deliberate using Tikanga Māori. All these points would have to be considered.

Views on what tikanga Māori is, or is not.

Mead (2003) is the foundational teaching of Mātauranga Māori (including Tikanga Māori) kaupapa of this thesis. Other have expounded on the subject with their varying interpretations. Followers of the Reverend Māori Marsden (1924—2003) claim that tikanga Māori as being an esoteric doctrine intended for only a small or select group of people. Another Christian community leader speaking³⁴ said in te reo that in his church’s opinion tikanga was

³³ There is no glossary or explicit description of what constitutes Māori Management. It is a vague term.

³⁴ Jehovah’s Witnesses. Retrieved from

<https://www.google.co.nz/search?q=jehovahs+witness+and+maori&oq=jehovahs+witness+and+maori&aqs=chrome.69i57.7871j0j7&sourceid=chrome&ie=UTF>

incompatible with the biblical scriptures. Their religious dogma presented ethical and legal issues both incompatible with tikanga Māori, specifically kaihau-waiū or birth right. Mead (2003) teaches that, “the dynamics of birth right, the conferred rights that a child can expect from being born Māori are based on tikanga.” The merits of that dogma were also argued in the Canadian High Court in *A.C. v. Manitoba* (26 June 2009), where the same sect denied a medical procedure as contravention of the kaihau-waiū principle in te ao Māori, and to *Ren* in Confucian philosophy. The latter holds to benevolence, perfect virtue, goodness and human heartedness as the essence, to love others. By the way, Mead (2003) asserts that the any purported exclusivity is based on the adoption of religious dogma and is against traditional Māori beliefs.

A corporate view on tikanga Māori

A prominent Māori lawyer and corporate executive for a multi-billion-dollar iwi corporation published an opinion piece in the New Zealand Herald newspaper³⁵ for the appointments of corporate “Tikanga Māori Officer” and “Chief kaupapa Officer”. No names, no qualifications or backgrounders were attached to the proposed executive appointments. This research reiterates (Mead, 2003) that the responsibilities for tikanga and kaupapa is incumbent on all employees, not to be assigned to an individual or individuals. Why? Simply because the rules for corporate decision-making are majority based, thus making tikanga and kaupapa options, rather than underpinnings.

Tikanga Māori in the context of Aotearoa New Zealand legislation

³⁵ The online version of the New Zealand Herald. Retrieved on June 17th, 2016.

http://www.nzherald.co.nz/business/news/article.cfm?c_id=3&objectid=11440671

In this bicultural nation, there exists for Māori two specialist courts and an ongoing commission that investigates into claims brought by Māori relating to Crown actions which breach the Treaty of Waitangi / Te tiriti o Waitangi. These two Courts of Record are the Māori Land Court and the Māori Appellate Court.

Chief Judge Sir Eddie T Durie of the Māori Land Court defines it as the values, standards, principles, or norms to which the Māori community generally subscribed for the determination of appropriate conduct (Durie 1994: p. 449). Dame Joan Metge also describes tikanga simply as ‘the right Māori ways’ (Metge 1996: p. 21). Chief Judge Joe Williams also describes tikanga as ‘the Māori way of doing things – from the very mundane to the most sacred or important fields of human endeavour’ (Williams,1998: p.2). No one definition is completely correct or wrong. The word tikanga originates from the two words ‘tika’ and ‘ngā’. ‘Tika’ can be defined as right, correct, just or fair. ‘Nga’ is the plural for the English word ‘the’. Therefore, in this context tikanga is defined as ‘way(s) of doing and thinking held by Māori to be just and correct’ (NZ Law Commission, 1998). The learned jurist further expanded:

This paper suggests that there are three levels of tikanga. The essential principle underpinning tikanga at the highest level is the notion of what is right and moral, and what is wrong. Below the principle of what is right and wrong are the core values which underpin this notion. The final level of tikanga was the practice and application of these core values. Māori Customary Law rather than tikanga is explained here for it is a term used by the Crown in matters pertaining to the Treaty of Waitangi Tribunal.

Establishing tikanga Māori compliant AI technology

A definition and the scope of Mātauranga Māori was offered by Whatarangi Winiata (2001) as,

Mātauranga Māori is a body of knowledge . . . explains phenomena

drawn from one generation of Māori to another . . . has no beginning and is without end . . . being constantly enhanced and refined . . . each generation making their contribution to Mātauranga Māori.

Implicit is the need to find or the development of the necessary tools and technology that must also be tikanga compliant. The analogy used earlier was to move from ‘white board and marker’ to the developed technology used by contemporary business organizations. In creating this project tikanga, Mead (2003: p. 26), orders,

by focusing on pono a judgement may thus be made on whether the practice of a particular tikanga is true to the principles of Maoritanga are important . . . order to qualify as tikanga Māori a ceremony, for example needs to be correct and true to the principles and values of Māori culture.

Stephens (2001) points out the need to be careful with interpreting tikanga Māori for subtlety (countable and uncountable) and the need to always consider context for, “tikanga contains central values common to different hapū and iwi and practised according to contextual situations of these groups against which all rules may be measured.”

Mead (2003; p. 20) articulates the philosophical underpinnings of mātauranga Māori as:

[t]o participate in the Māori world needs to know not only the language but also, the culture and its tikanga. Without knowledge about tikanga . . . is uncertain of what is expected, moves with great uncertainty within the culture and becomes very reliant on others for guidance. Peace of mind is greatly assisted by having a fair degree of knowledge

Confucianism epistemology

The Master (Kong Qui) said, “When you know, to know (recognize) that you know; and when you do not know, to know (recognize) that you do not know; that is knowledge.” (*Analects* 2.17)



Figure 5. The Teacher, Editor and Philosopher

While describing the teachings of the sage Yang (1961) contrasts Confucianism with Christian beliefs this way:

it as being definitively pantheistic and nontheistic, not based on the belief in the supernatural, or for a personal relationship to a god as being separate from the temporal plane.

Therefore, it is possible to believe in Confucian teaching and practises as well as being a believer in one of the Abrahamic religions of Judaism, Christianity and Islam. The guiding principles of Confucianism and one of those faiths are not mutually exclusive. Much the same as tikanga Māori and relationship with the same religions.

To help non-Chinese understand who Confucius was, and what his beliefs stood for, the works of the 17th-century European Jesuit (a Roman Catholic order known as the Society of Jesus, set up in the 16th century) as mission scholars / priests Michele Ruggieri, Matteo Ricci and Prospero Intocetta, moved to China to directly translate the Chinese texts from the Lunyu, and who wrote extensively on the works of Confucius in Latin beginning in 1687 (Yu, 2014).

In Mi (2017), the case is made for Confucius as being a virtue epistemological thinker and differentiates traditional Chinese scholarship with the modern Western model to simplify the science of knowledge this way.

based on the (Confucian / Kong Qui) thoughts expressed in the *Analects* . . .
the significance of Confucian thought within the epistemology will
continue to make a contribution to progressing contemporary epistemology.

In contrasting Kong Qui (Confucius) with Aristotle and Socrates, Mi (2017) further explains

Unlike Aristotle, however, (Confucius) did not leave us any writings through which we could discover his ideas. Rather, like Socrates we learn about Confucius' ideas through records kept by his students in the . . . form in which we have Confucius' ideas is not such as to lend itself to comprehensive unambiguous accounts of theoretical positions; interpretations of Confucian thought is required.

Confucius also lists *zhi*, wisdom, as a virtue. In fact, it is listed in the *Analects* as one of three virtues that lead the way to becoming a *jun-zi* (is a Chinese philosophical term often translated as 'gentleman' or 'superior person' and employed by both the Duke of Wen and used in the I-Ching – 'Classic of Changes' or 'Book of Changes' – one of the oldest of the Chinese Classics). "The wise (*zhi*) are free from perplexities; the virtuous [actually *ren*] from anxiety; and the bold from fear. *Zhi* is, therefore, a significant virtue in Confucian thought and an intellectual virtue

at that Confucius is undoubtedly concerned with moral issues". (*Analects* 9.29, discussed in Mi (2017, p. 365).

Mead (2003) describes the importance of tikanga values and their use within the whānau, hapū and iwi in deciding what is wrong and what is right to set standards of behaviour.

The same applies in Confucian virtues and referred to in the *Analects*. Illustrated as logograms and expressed in Traditional and Modern Chinese with Pinyin captions, what the sage taught as important values of which two are represented here. Firstly, there is filial piety as *xiào* and humanness as *ren*, and pronounced 'jen', that translates³⁶ to goodness and benevolence. The use of written Chinese here illustrates their aesthetics, as principles concerned with nature and the appreciation of beauty, as the second part of axiology, the study of the nature of value and valuation, and the kinds of things that are valuable.



Figure 6. The Confucius Virtue of Filial Piety

The top portion shows an old man and underneath, a younger man supporting him, there is a sense of support and respect for the older generation by the younger. The Confucian

³⁶ In tikanga, I make the point that understanding the full meaning of the principles is dependent on proficiency in te reo Māori as a pre-requisite, as directly proportional. As a student of Chinese, I can only quote from what I am taught, for the full meaning of these two virtues, particularly *ren* can only be explained in Mandarin. To think otherwise would be preposterous and disrespectful.

interpretation is that it is also reciprocal in that the parents nurtured their child since infancy to then to care after their parents at an old age and to revere them after death.



Figure 7. Confucius Virtue of Ren

Another key value in Confucian thinking is humanness (ren) the care and concern for other human beings. Its character is made up of two parts: the left element means a person or a human being with the right element representing the numeral two. Ren has a sense of a person together with others creating the concept of society.

儒教
rú jiào

Of Being

- Fundamental precept
- Āi = aroha/ manākitanga
- Rèn – “Benevolence, charity, humanity, love”.

Figure 8. The Confucian Virtue of Being

Their translated texts influenced great European thinkers of the period. One was the French philosopher Voltaire who Lan (2005) reported saw the concept of Confucian rationalism as an alternative to Christian dogma when saying the following:

Confucius has no interest in falsehood; he did not pretend to be a prophet; he claimed no inspiration (from a God); he taught no new religion; he used no delusions; flattered not the emperor under whom he lived.

Gottfried Leibniz (1646 – 1716) the prominent German polymath and philosopher in the history of mathematics, and whose accomplishments on differential and integral calculus brought him prominence as a European thinker, expressed his thoughts on Confucius this way according to Mungello (1971),

(Confucianism) is an attractive philosophy because of the perceived similarity to his own and that certain of his elements were a “simple substance” and “preestablished harmony,” were borrowed from his interactions with Confucianism.

Although Mateo Ricci (Gunn, 2003) saw Chinese (Confucian) rituals as civil rituals that could co-exist with spiritual rituals of his Catholicism, by the 18th century the Dominicans and Franciscans began to dispute the ‘Chinese ancestral worship’ as idolatry. In 1742 Pope Benedict XIV ordered a ban on Chinese rituals.

This business-oriented research focuses on the seminal works published between 2001 and 2013 by Low and Ang (2012, 2013) as the basis for creating their document titled *Corporate Social Responsibility*, that is underpinned by Confucius teachings. This will help hapū to understand their rules of ritual and kawa preparatory to entering a Sino-Māori trade relationship.

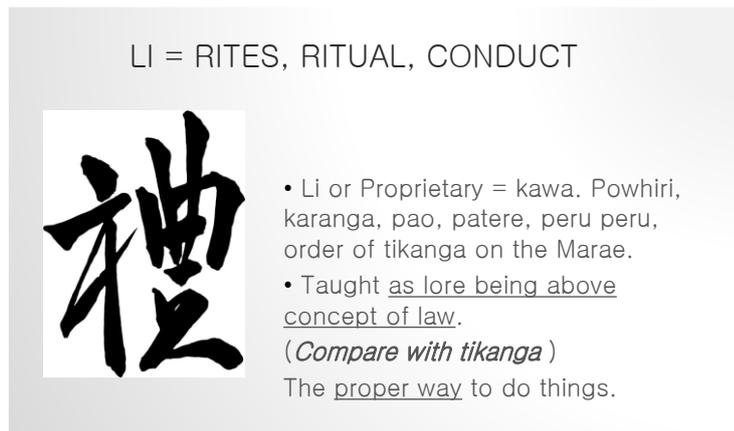


Figure 9. The Confucius Virtue of Li

The starting point of Confucianism are the three values according to Robert Oxnam, President Emeritus, Asia Society, is Xiáo, being considered the most fundamental, the root of all others and humaneness (Rèn) is the ultimate goal. The third value is ritual consciousness (Li^3). Each of these tenets are expanded in the glossary. The Māori words whānau, the concept of the extended family is the closest to Xiáo with tikanga Māori and kaupapa Māori, is to Li^3 . The Ngata Māori dictionary defines humane as hūmārika or ngākau atawhai.

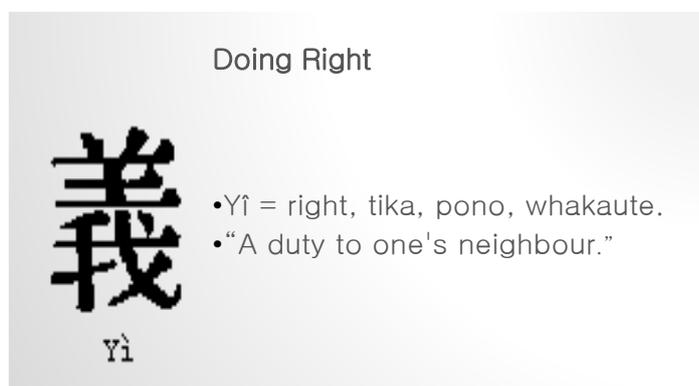


Figure 10. The Confucian Virtue of Yi

Developed by the Chinese philosopher Confucius Pinyin: K'ung *Fu-tsu* Kung Fu Zi, “Master Kung”, 551-479 BCE, an esteemed thinker and social philosopher whose teachings and philosophy have deeply influenced Chinese, Japanese, Korean, Singaporean, and

Vietnamese thought and life (Wei-ming, 1976), (Low: 2001, 2002), Corporate Culture and Values (Low, 2002), Motivation, the Chinese leadership way in Singapore's small and medium companies, (Low, 2006).

The Confucian tenet of 孝 or xiào in its Pinyin form is a virtue of respect for one's parents, elders and ancestors. The same veneration exists in the SINIC influenced countries of East Asia. At the centre of Confucianism lies relationships (Rarick, 2007; p.3). To counter the speculation by Western religious scholars that Confucianism was another theology of religion like Christian, Hindu, Islamic or Judaism, Ip (2009) writes that:

[C]onfucianism era lasted from 206 B.C to 1911 and taught ethical values without any religious connotation . . . foundations of Confucian tradition aim to achieve harmony within a society. These values are rooted in a hierarchal and patriarchal system where individuals always owe respect to their senior, who in turn must give protection and care (Zinzius, 2004).

The Analects in XV:24 quotes what Confucius outlined as the human (Lin, 1994 p. 186) qualities,

not to do unto others what one does not want others to do unto oneself and expressed as a principle to man that one moves away from oneself and becomes less self-centered . . . more thinking of others . . . more altruistic.

To the list of desired Confucianist leadership qualities Low (2006; p 10) added honesty and integrity. Five years on, Low (2011) added the concept of **Ren**. It is the Confucian virtue of benevolence accentuating humanism, for the love for mankind and of nature; being ethical, the impact of an action or lack of, to the environment and the public at large.

Confucian Philosophy as the partner bedrock philosophy

Recall Sharples (2012) who stated the Māori blood ties to Asia and that Confucian philosophies alongside mātauranga Māori gave the moral and philosophical compass to any trade relations.

The minister further elaborated when addressing a business round table:

What we've discovered is what I call the Maori edge in business:
kanohi kite kanohi. It means talking face-to-face – where you create respect before you do business . . . parallels on relationships, genealogy with the land and family . . . introducing Māori rituals . . . waiata or a chant.

Sharples reinforced the whanaungatanga/guanxi (building relationship) aspects, “once you’ve gone and done that it’s easy to relate with the people as old friends, old cousins, and that’s the secret to our success.” The Hongkong New Zealand Business Association responded, “Dr Sharples is correct, “they (Chinese and Māori cultures) are both respectful and hierarchical, so at a business level they communicate very well.”

Confucian Philosophy is codified and in English

The entire texts of the Confucian Analects and supporting linkages have been codified and are listed in English by (Legge, 2009) that hold to,

extended knowledge which concerns epistemic cooperation with others requires reflection and consensus. By establishing consensus, a group has peace or harmony which allows it to persist as a social unit and facilitates learning cooperation.

Historical trade between these cultures

Three New Zealand researchers (two Māori and one English-born) have undertaken

publishable research. One was by Professor Virginia Warriner (2009), whose PhD thesis was titled “Internationalisation of Māori Business in the Creative Industry Sector.” In Henry (2010), a Hui Taumata Summary Report (2005), developed a set of recommendations focusing on research and strategy; intellectual property and Brand Māori, as a cooperative action within the screen production sector. The Petrie (2002) presentation to the XIII World Congress of

Economic History in Buenos Aires followed by the publication titled: “Chiefs of Industry: Māori Tribal Enterprise in Early Colonial New Zealand” (Petrie, 2006) explored the entrepreneurial spirit and activity and details the Māori capital-intensive enterprises pre and early colonisation. Moreover, it highlighted the phenomenon of Māori ship ownership and flour milling to their exports of vegetables and pork to Australia in the mid-1800’s. Anecdotal third-party reporting by a non-Māori author pointed to seal skin exports to China in the early nineteenth century. As of 2015, there were no published papers specific to Sino-Māori trade from Aotearoa sources. There were, however, iwi already trading with China. Sourcing their websites and published company records came from the public domain. Actual extracted data and statistics from various governmental agencies came as secondary sources and are annotated as such.

Does Kaupapa Māori have a role to play in the export corporation?

Within the hapū corporate its kaupapa (Walker, 1991) defines the ‘life for Māori’ and to use functions of governance described earlier, as the *why, what, when, which* and *where* such as described by the Wakatū Corporation Our past, Our Future (n.d.) At the whānau, marae and hapū it strengthens relationships through its elements of Maoritanga and taha Māori. Whereas,

in the corporation hapū, tikanga-a-hapū determines the *how* everyone including non-Māori behave and perform.

In describing “management the Confucian way” Low and Ang (2013a) uses the survey by the University of London (1994) to define management this way:

it is the act of supervision . . . refers to skills of executive ability . . .
 management comprises planning, organizing, staffing, leading or directing
 and controlling an organization . . . for the purpose of accomplishing a set
 of goals.

A corresponding list of te Ao Māori equivalent terms and examples has been added to the Low and Ang (2013a) table as a recommendation for the hapū governance entity.

Management principle	The Confucian Way (Low & Ang, 2013a).	Te Ao Māori (Based on the Ngata Dictionary© (Equivalent Maori word and example of its usage.)
Planning	- Ensure effective planning, prepare carefully such as strategic positioning; grow a dynamic and talented human capital; and ensure effective and efficient supply chain management in the selling one’s products or services.	-whakatakato kaupapa, tātai whakaaro, whakatakoto tikanga. Ka whakatakoto kaupapa te kaiwhakahaere kia kōkiringia ngā take I mua o te kāhui kaumātua
Organizing	-Attending to peace and harmony (和 hé píng) with others in the organization - Being just or having moral courage (義, yì) - Practicing integrity (廉, lián) - Being aware/ careful of shamefulness (恥, chǐ).	-Whakarite(a), whakahaere(tia). Ka taea e koe te whakarite he hui me to whānau.

Staff	- Practicing loyalty (忠, zhōng).	-pūmau, ngākau pono. E kore e rangirua tōku pūmau ki tōku whenua.
Directing	- Being benevolent (仁爱, rén ài). - Practicing filial piety (孝, xiào). - Fostering the feeling of brother (sister) hood (悌, tì).	-whakahaere. Ma te kaiako e whakahaere ngā mahi a ngā taurira.
Controlling	- Growing trust (信, xìn), trust ensures smooth operations of the running of the business / organization, with little or no conflict. - Observing rites and social rituals (禮, lǐ) and ensuring its place in organization. - Overall, they also help to ensure that the team members stayed energized while working as a team.	-whakahaere(a). Ka whakatūria e rātau he tangata matatau hai whakahaere i ta rātau pākihi.

Figure 11. A suggested governance entity

Interpreting Confucian / Western / Māori philosophies in the AI context

This research draws heavily on Low and Ang (2012) for the application of Confucian ethics/virtues in business and articulated from two perspectives: Confucius and Western thoughts to be juxtaposed with the principles of mātauranga Māori. The influence of Confucian they write,

influenced the Chinese, Japanese, Korean, Vietnamese and Chinese diaspora living in other South East Asian countries, through business and culture and life with Yang (1961) stating Confucius had some influence in the Western World also.

In Low (2011) embracing and practising Confucian ethics enables one to self-cultivate in pursuit of the *Tao*. In the Confucian sense (Low, 2001, 2002, 2005, 2006, 2010a, 2010b, 2011) being benevolent (*manaakitanga*) or kind (*aroha*) is a characteristic element of humanity and a part of an individual's talent. *Tao* in governance stresses personal.

Regardless of their geographical origin, in AI, the Information Sciences expressed all in the same binary character form of '1' or '0' (Stokes, 2007) in the computer memory. Whereas, the philosophical description is in letters of the alphabet forming an artefact, being knowledge. Binary characterization enables AI to be in "read" only state and **never changed**, in that data environment. This is important for some to know and who fear that **tikanga can be manipulated and exploited**. Understanding how *mātauranga* is acquired and any limitations therein provides the knowledge engineers in AI how to understand its purpose. Bawden (1991) expresses an understanding of what constitutes knowledge through the definitions of epistemology, ontology (even at sub-ontology levels), and axiology, of the nature of value and valuation, and the kinds of things that are valuable.

Social entrepreneurship

This principle is suggested as the model for the start-up *tikanga* based corporate philosophy.

Mair and Marti (2005) explains it this way:

[i]ntegrates economic *and* social value creation . . . long heritage and a global presence . . . a multidimensional construct involving the expression

of entrepreneurially virtuous behavior. . . a coherent unity of purpose and action in the face of moral complexity, the ability to recognize social value-creating opportunities and key decision-making characteristics of innovativeness, reactivity and risk-taking.

Haugh and Tracey (2004) describe the “community minded”, the social enterprise that reflects the Māori enterprises from their humblest form to the existing billion-dollar exporters who uphold the tikanga principles of whanaungatanga, kaitiakitanga and manaakitanga this way:

Social enterprise[s] [are] business [es] that trade for a social purpose. They combine innovation, entrepreneurship and social purpose and seek to be financially sustainable by generating revenue from trading. Their social mission prioritizes social benefit above financial profit, and if a surplus is made; this is used to further the social aims of the beneficiary group or community, and not distributed to those with a controlling interest in the enterprise.

In Friedman (1970), the author critiques the notion of the “social responsibilities of business” as being notable for their analytical looseness and lack of rigor. “What does it mean to say that “business” has responsibilities? Only people have responsibilities. A corporation is an artificial person and, in this sense, may have artificial responsibilities, but “business” cannot be said to have responsibilities, even in this vague sense. The first step toward clarity in examining the doctrine of the social responsibility of business is to ask precisely what it implies for whom.” This research will through data collection and qualitative research methods seek to address that question.

A disinterested party is the North American writer Frederic Sautet (2008) who articulated a history of the sustained nature of Māori entrepreneurial confidence and spirit to the New Zealand government and a privately held party of New Zealand businesspeople. The publication titled “Working Paper 3 to the New Zealand Business Roundtable” reports,

[E]uropean explorers arrived and began quickly building important trading relationships in the first three decades. Māori quickly sought resources and products for example such as: foodstuffs such as potatoes, chickens and pigs; tools, especially metal tools such as axes; weapons such as muskets; and clothing such as cotton, wool and leather.

Contrast the findings of that disinterested researcher with a practitioner whose vested interests benefitted her hapū. Warriner (2009: p. 17) expands the Sautet (2008) scope and the definition of what really constitutes a “Māori business.” Earlier focus was on producing Māori products and services for the international marketplace to the benefit and economic well-being of an individual, marae, hapū or iwi. Whereas, a “business” in this research’s context would add two further permutations: one being multiple hapū ownership including whānau trusts and secondly, non-Māori participating investors or foreign shareholding by equity partnerships such as the case of the firm Miraka (Vinamilk raises stake in New Zealand’s Miraka Company, 2015).

Governance leadership qualities

The personal qualities expected of each of the governance and executive officers (Mead, 2003; p. 237) were: pukuaroha (empathetic), pukumahara (cautious), pukumahi (hardworking and industrious person). What personal were not acceptable are: pukukai (greedy), pukukata (one given to much laughter, pukuriri (angry) and pukutākaro (a playful person).

Cultivating trust in corporate governance

If people like you they will listen to you, but if they trust you,
they’ll do business with you.

By Zig Ziglar³⁷

In explaining growing trust (信 *xin*), *Zi Xia*, a Confucian disciple (Analects of Confucius, XIX: 10) explained the virtue of trust this way,

Gentleman must gain the trust of the common people before he gives orders to them. Otherwise, they will feel abused. The gentleman must gain the trust of the ruler before he remonstrates with him. Otherwise, the ruler will feel slandered.

Both Low and Ang (2013a) articulate a contemporary view of trust from management in today's work environment in recommending,

trust must exist so that each can perform their duties smoothly without much interference of micromanagement . . . in a sense of some level of empowerment prevails . . . is good and motivating for the employees . . . benefits through retention of its skilled pool of human capital.

Three models of interpersonal trust development are expressed in a framework from the researchers Lewicki and Bunker (1996) and articulated as follows:

Calculus based: through predicting partnership behaviour using “tests” to and calculate through building trustworthiness to the next level of the relationship. By understanding beforehand and maintaining the virtues of *guanxi* and *whakawhanautanga*, the trading partners have a baseline from which to begin negotiations. Ngāi Tahu Tourism leader (The Ngāi Tahu

³⁷ Born 1926, Died 2012. An American Salesman, motivational speaker.

Website, n.d.) describes their trust type relationship with existing PRC clients with great enthusiasm this way:

[i]t as a kind of mihi. Whenever we visit China . . . doing that a lot in the past four years . . . we talk of our history and values . . . the tribe's identity . . . and the 300,000 Chinese visitors to Aotearoa during the past 12 months. Seventy percent of whom are our customers. Trust is key . . . our two Chinese language-speaking staff – building those relationships . . . sitting around the table, eating kai and talking. I think they're also saying to themselves, 'are these guys going to be around next year, or in five years?' Yes, we found very useful cultural common ground . . . It helps us to build trust in the market . . . our ownership structure and the fact that we are Ngāi Tahu.

Knowledge-based: created over time in the negotiations with that knowledge of predictability contributing to the ability to plan, make investment or, other decisions contingent on behaviours (McKnight, Choudhury & Kacmar, 2002). Cultural and business practises was an integral part of our employee indoctrination training preparatory to the IT secondment to the Evergreen Group,³⁸ a privately-owned corporation in Taiwan.

Identification based: trust is of the highest kind found at corporate level for there needs to be a strong mutual understanding of the roles of each player. The rigorous choice of prospective executive members by the board members ensures one party can act on behalf of the other. This thesis asserts that cultural and historical connection also contributes to identification that are espoused in the corporate vision, mission, values and loyalty principles and be known to both parties and mutually beneficial in the long run (Borgen, 2002).

³⁸ Business case study of Dr Chang Yung-fa Director of Evergreen (Taiwan). Evergreen Group values are heavily influenced by Confucian ethics. The EENI Business School & HA university in Barcelona Spain. Retrieved from <http://en.reingex.com/Chang-Yung-fa-Taiwan.shtml>

Tikanga and hybridization

The tikanga Māori principle of Kotahitanga (unity or solidarity) is the ‘identifying as one or, of sharing, and extending support to others.’ Uz (2014) explains it this way:

[i]s an increase in within-culture variation, but at the same time
an increase in the similarity of cultures which once were distinct.

While the notion of hybridisation challenges Māori as being fixed or insular in their thinking and may not work, there is evidence from the exemplars that the stability of the hapū or iwi does remain a constant or in a state of being bounded especially in order to meet its needs to support marae and whānau. This encourages pragmatism.

In Mead & Grove (2001: p. 355) reference is made to the whakatauki: taku ahi tūtata, taku mata kikohe, taku ahi mamao, taku mata kipōro that translates as follows:

Distant ‘fires’ have a habit of coming close to home so that we do have
to sharpen our wits and deal with them . . . (by) attempting to discover a
position, we will discover a position, however, we will have to engage
with tikanga Māori and its knowledge as mātauranga Māori.

That concept is supported by Lusty (2007) in the proposed relationship between Confucian Philosophy and mātauranga Maori.

The decision-making burden of today’s hapū export corporation boss

A decision-making activity network called OODA (Osinga, 2006) presents the high-level executive (multi-million dollar in assets) leader with a list of tasks to perform, each and every time. Here are three scenarios:

- Representatives at the table with expertise in Tikanga Māori, Confucian Philosophy, International Law, Best business Practices, Community or shareholder representatives, Marketing, Sales, Compliance and Legal, Operation Research Group, Department Heads, and that each is assumed in having knowledge from prior meetings. Recorders/secretarial staff with accesses to prior senior level conferences minutes. This meeting is normally scheduled on a weekly basis unless an extraordinary meeting is called.
- Semi-automated whereby each of the above representative has direct access to her/his own departmental data. The quality is typical data rich, but information poor. HBR (2014) calls this,

having troves of data is of little value in and of itself. What separates winners from losers is the ability to transform data into insights about consumers' motivations and turn those insights into strategy. Building an Insights Machine. Access to data would still be filtered and available weekly.
- This doctoral research's model hapū export corporation with AI/ANN capacity to access its secure warehouse of all departmental data. Maintained by hapū AI Operational Researchers ensuring data currency with internal capacity-created information uses Artificial Neural Networking to simulate the human mind in gathering and discerning information then to massage it with the applicable tikanga creating the decision. This capacity is available 24/7 to nominated Users over the Internet via Personal Computer, Laptop, Tablet or Cellular phone.

Expert System - the cross-bedrock application requirements & support

In their essay, Wheeler & Pereira (2004) took the view, “that analytical epistemology and artificial intelligence are complementary” by asserting that traditional epistemology occupies itself primarily with two sorts of concerns:

the analysis of fundamental epistemic notions such as *justification, evidence* and also *belief*, with the analysis of key epistemic relations . . . like *is warranted by, supports*, and *is reasonable to infer*.

The chief concern, “is the challenges posed by skeptical arguments to the possibility of having knowledge” especially where developers are not only technically competent but speak the languages of the clients.

Holding a proprietary partition for esoteric knowledge within AI

Using Langer (1997) a provision has been made within the AI design to hold knowledge deemed by hapū / corporate leadership classed as restricted and held in a partition with security access e.g. commercially or esoterically sensitive.

Ontologies / sub-ontologies

There are two types of ontology applicable to this project: a) the philosophical kind based on lived realities and associated with fact and theory (Fonseca, 2007); b) AI describes its ontology

as an engineering artifact made from a specific vocabulary describing a certain reality. For the purposes of this research, the philosophical ontology will create the knowledge base to populate AI. It is derived from mātauranga-a-hapū using the collection method devised by Doherty (2012, pp. 15–37).

In AI, ontologies have the dual role that include ontologies *of* Information Systems and the ontologies *for* Information System. To clarify: *for* is that externally offered data such as mātauranga whether tacit, explicit or embedded (defined in the HMMead_Algorithm© diagram in Figure 3.) and referred to as philosophically based ontology. As the Researcher and AI engineer, I provide this inanimate computer hardware with the programming instructions AI needs to ‘see’ that knowledge and ‘manipulate’ it to produce the desired results. These are the *of* ontologies. Both have important roles (Guarino,1998).

Axiology

The study of the nature of value and valuation, and the kinds of things that are valuable.

Historical Chinese and Māori ties

If you understand others you are smart.

If you understand yourself you are illuminated.

If you overcome others you are powerful.

If you overcome yourself you have strength.

If you know how to be satisfied you are rich.

If you can act with vigor, you have a will.

If you don't lose your objectives you can be long-lasting.

If you die without loss, you are eternal.

— Lao Tzu, Tao Te Ching³⁹

The questioning of the Chinese and other migrant's presence in New Zealand is also a present-day phenomenon by local critics. The statement on 3rd April 2008 by Peter Brown as former deputy leader of the New Zealand First Party drew widespread attention after the expressing concern at the increase in New Zealand's ethnic Asian population, (Brown, 2008) in the press.

We are going to flood this country with Asian people with no idea what we are going to do with them when they come here . . . there is a real danger we will be inundated with people who have no intention of integrating into our society . . . to form their own mini societies to the detriment of integration leading to division, friction and resentment.

A former NZ Labour Minister of Māori Affairs, the late Parekura Horomia (2007, April 25) contrasts the NZ First Party's position when commenting positively on the successes enjoyed by the Chinese who had been in the country for some time, and of the recent other Asian arrivals thus:

We preach whānau whānui doing things for the good of the whole extended family we've got to practice it. But it's certainly what the Indians and Chinese have done over years in this country, they've merged their mortgageable assets, they've gone and used the banks, they've used the government agencies and they've gone and used whoever they can, and they've certainly built up equity.

³⁹ Ancient writings by Lao Tzu (c.605BC-c.531 BC) Tao Te Ching - The Book of The Way and its Virtue. (Note: Like other ancient writings does not have an ISBN # for the reference section.)

Manying Ip, Auckland University's Professor of Asian Studies studied the history of Sino Māori relationships and published under the title "Chinese Perceptions of Māori - The IMPORTANT OTHER" Ip (2009, p. 149), and argues,

that the interaction between the new Chinese and Indigenous Māori are among the most pertinent issues facing New Zealand as a modern civil society. Referring to the fundamental questions about what is shaping New Zealand's national identity. The point is underpinned by the age old Pakeha-Māori, two-way tug-of-war, the twenty-first century is witnessing the evolution of a pakeha-Māori-Asian triangular engagement.

Additionally, Ip (2009, p. 150) deals with the arrival of the new Chinese immigrants, most with considerable wealth from the PRC and Hong Kong for example and that there is a perception by the new arrivals of the Māori struggling to re-assert their mana and sovereignty: te tino rangatiratanga. Note: The issues of bi-cultural and multi-culturalism are too numerous to discuss and out of the scope of the research hence only some relationships between New Zealand born Chinese and Māori are given exposure at this point.

Does Kaupapa Māori have a role to play in the export corporation?

Absolutely. Within the hapū corporate its kaupapa (Walker, 1990) defines the 'life for Māori' and to use functions of governance described earlier, as the *why, what, when, which* and *where* such as described by the Wakatū Corporation Our past, Our Future (n.d.) At the whānau, marae and hapū it strengthens relationships through its elements of Maoritanga and taha Māori.

Whereas, in the corporation hapū, tikanga-a-hapū determines the *how* everyone including non-Māori behave and perform.

In describing “management the Confucian way” Low and Ang (2013a) uses the survey by the University of London (1994) to define management this way:

it is the act of supervision . . . refers to skills of executive ability . . .
management comprises planning, organizing, staffing, leading or
directing and controlling an organization . . . for the purpose of
accomplishing a set of goals.

The trust deed is fundamental and establishes the legal requirements for Māori whether the unit of organisation is the whānau, hapū or iwi. Its serves as a deed of conveyance by creating and setting out the conditions from which the hapū operates today. While it is a legal organ and indeed a vestige of colonialism, nonetheless it sets down the ‘rules’ on how governance administer the functions charged with making principled and also pragmatic decisions. However, unlike their Aotearoa New Zealand counterparts, the Māori example has the element of tikanga that may override some functions. For providing that no criminal statues have been breached, the Courts of the land will defer any (Milroy, 2007; Williams, 1998; p 2) or indeed some resolution to the hapū / marae / whānau rangatira. Hapū after all, has tino rangatiratanga and the kāhui, as arbiters of tikanga may exercise their option of ‘organic tikanga’ as a remedy. That is their discretion in addition to asserting the principle of delegated authority to support the governance and executive. But as always, that decision comes with responsibility for in some cases, tribalism if it exists, may prevail.

What is not generally known by most New Zealanders is just how successful iwi were as entrepreneurs before, and during the early days of colonisation. They thrived until political pressure thwarted access to finance. Business records (Petrie, 2006) reveal a keen interest by

Māori in proprietary rights, quality assurance and maritime laws for their small shipping fleets around New Zealand then offshore to Australia. The extent is how Petrie (2006) writes:

[M]aori owned shipping in 1849 was for 118 registered vessels of ten tons or more employed in coastal trade. The Mataatua and Tūwharetoa tribes (8,000 people) had 3,000 acres in wheat, 3,000 acres in potatoes, nearly 2,000 acres in maize, upwards 1,000 acres in kūmara. Add to that, 2,000 horses, 200 head of cattle, 5,000 pigs . . . 43 coastal vessels nearly 20 tons each supplying 46,000 bushels of wheat.

The activities of buying, selling and managing on such a large scale, for that era attested to the chiefs and their lieutenants who quickly learnt the ‘Pākēha ways’ and to compete them with excellent negotiating skills both in Aotearoa New Zealand and the ports of Melbourne and Sydney. For assorted reasons that activity would cease (Petrie, 2006). A century and a half ago later, six iwi owned and mixed iwi and privately owned corporations have through the ability to make good business judgements and quick decision surpassed the billion-dollar threshold in assets. Led by some of the best executives in the land, the push to expand into new markets such as to the PRC underscores the need to use ES with AI capability to provide knowledge-based data into the processes for making decisions at the multi-national level are complex.

Māori leadership (Mead, 2003: p. 212) traditionally arrives at a decision this way:

At hapū discussion was kaumātua or rangatira of the whanau gathered together and shared in the decision making. The task of the hapū chief (leader) was to listen(ed) to, the opinions of the kaumātua and others, consider the essential points and then, at the very end of the discussion, summarise and make a collective decision. The word of the chief then became the policy for all to follow.

Each member from the whānau, marae, hapū or iwi has the mana to act in its best interests and that is no different today as shareholders of the marae corporate. Of equal importance are the legal statutes of the land that give legitimacy to that body to act on the other behalf as shareholders. More importantly, breaches must be resolved transparently with the full knowledge of its members.

It is becoming the practise within some (personal communications) hapū that governance proceedings be conducted in te reo Māori (me ōna tikanga) and underpinned by tikanga Māori. In some hapū the discourse is being developed through a process of articulating tikanga knowledge and its power, concepts, theories, and practices for understanding tikanga. This is the learning exercise built on whanaungatanga, another attribute of tikanga Māori. An interesting practise (personal communications) is that having contentious issues tabled to be resolved later where hopefully, ‘wiser minds would prevail.’ The danger is that some issues are ignored and become litigious. For rangatira, tikanga will always prevail (Milroy,2007).

Unfortunately, today, as with other societies, ego plays an unfortunate part in the intra-tribal discourse resulting in litigation that is sometimes unjustified to the rest of the community. But more than often, level-headed rangatira use arbitration based on tikanga for handling objections. This can be seen at hui where wiser leadership prevails.

Soft Power as a corporate strategy

Water is fluid, soft, and yielding. But water will

Wear away rock, which is rigid and cannot yield.

Lao Tzu

Laozi (Lao-tzu), the 6th century BCE legendary Daoist philosopher, taught soft power as being descriptive, meaning that could be either true or false rather than being a normative concept that states such and such ought to be the case. Contrast that with tikanga (Mead, 2003) which is a prescriptive norm in nature; for tikanga states *a.* position and not *the* position. While the phenomenon of ‘soft power’ by Joseph Nye (1990) was advanced as a ‘new idea’ that advances the approach of attracting and co-opting, rather than to coerce through ‘hard power.’ The virtues of whakawhanaungatanga and guanxi, both thousands of years old, achieve that goal. Take one of Māori exemplars in the Ngai Tahu Tourism (Ngāi Tahu Tourism, n.d.) team whose corporate marketers make several visits to the PRC to “eat a lot of kai with both prospective and existing customers and talk of their whakapapa and history.” Sales talk and the opening of the Orders Book may not take place at the first, second or third visit but until after the relationship has been established.

The role of the Kaumātua, Koroua, Koro and Kuia

Leadership from the marae to the rūnanga and to some degree outside both is incumbent on a single or multiple male figure of the hapū with the title kaumātua.

Metge (1995) explains it this way:

For example, the common practice of translating "kaumātua" by the English "elder" has misled Pākehā into taking advanced age as the defining feature of this role, whereas to Māori the exercise of leadership functions are as if not more important ... the concept kaumātua has five components, age plus social seniority plus life experience plus wisdom gained from reflecting thereon plus current occupancy of a position as leader to a group. Of these, age is perhaps the least essential. True, the word ‘elder’ as used in English also has implications of experience and wisdom, but because

of its form it is associated first and foremost with advanced age.

Then in New Zealand (1996) reported that over recent years there has been a steady increase in Māori terms used in statutes.

E-learning

This researcher in conjunction with Foundation has the expertise and professional training necessary to create training programs for hapū small business operators through the incremental levels required by management to that of governance and executive functions in the Sino-Māori corporate. A portal or gateway within He Patai© will provide 24 access to that function. Both Daniel (1997) and Johnstone (1991) teach that the use of information and communication technologies (ICT) in teaching and learning will provide at least part of the solution to many of the issues of technology to universities. Its implementation requires the same management commitment as other mission-critical organisational wide initiatives (Henry & Pene, 2001).

Chapter summary

There was no peer-reviewed data on Māori trade with China based on the cross-bedrock philosophies, but Uz (2014) presented the hybridised conceptual framework as the basis for this research towards cross-cultural trade. Fortunately, Low and Ang (2013a) had generated an abundance of business scholarship based on Confucian Philosophy. Bol (2012), provided the Neo-Confucianism scholarship.

Chapter conclusion

Since time immemorial, these two cultures have practised their respective bedrock philosophies as guiding principles in human endeavor and conduct. Now through commerce, each of the

principles has been adapted to meet contemporary needs yet the original intent has never changed. As the Sage taught, ‘that to wish to be enlarged (a leader) must also seek to enlarge others.’

CHAPTER THREE – Research Methods and Methodologies

The methods section describes processes undertaken to investigate a research problem and the rationale for the application of specific procedures necessary to identify, select, process, and analyse information towards understanding the problem.

The methodologies section then answers two questions: how was the data collected or generated? Then, how was it analysed. Details of the procedures and outcomes will be presented further on in this chapter. The summary section restates the main arguments and evidence while the conclusion articulates the thought processes involved.

The subjects for this research project are complex and multi-disciplinary in nature. They encompass the social sciences (culture, economics and law), humanities (geography, history, languages, philosophies), and applied sciences (computer science, information sciences, engineering and technology). That notwithstanding, the rule remains that each finding must not be influenced by personal feeling, interpretation or, indeed prejudice. Only the facts are important to the research objective. It also positions me as a Māori researcher who must be subjective, explicit, and importantly, to declare any biases (Kiro, 2000).

Case study research method

The combination of social science, information science, business, requires an investigative tool that provides depth and description especially where the boundaries between the phenomenon and context are not so well defined. This empirical inquiry can be single or multi-thread or intrinsic. Its purpose is to highlight issues identified by a researcher that addresses the research

questions and providing a detailed and deep description for presentation in the findings (Creswell, 2003).

A case study meets the need to examine practical problems considered as relevant from both sides, not only from business managers and scholars but potential users. The deliverable(s) may generate a theoretical model that explains a specific problem and at the same time abstracts for a model that can be applied in other contexts (Graf, 2016).

Creating the hapū enterprise

Should the research questions be simply “how” and “why”, then the case-based study is the preferred method rather than surveys and the analysis of the archives (Yin, 2003, p. 5). However, it may also be used in conjunction with kaupapa Māori and qualitative research to access archival data such as case law from the New Zealand Legal Information Institute (NZLII), a free access database and of course, the Waitangi Tribunal through the Office of Treaty Settlements.

The mixed-method approach

The primary difference between qualitative and quantitative data is that qualitative is descriptive while quantitative is numerical. The integrity of AI in He Pātai© is dependent on both sources.

Qualitative research is primarily exploratory in nature and used to gain an understanding of an underlying problem through eliciting opinions and their motivations from human sources. This method of data collection varies through using unstructured and semi-structured techniques. Responses from the singular or group discussions provide observations and their supporting data.

In chapter two, a business case was made to support the implementation of AI to support any hapū and its commercial holding to make quality sustainable⁴⁰ tikanga-a-hapu based decisions. Building that case required using qualitative research methods to accumulate largely non-numerical data by seeking in-depth understanding of human resources, business procedures, best business practises, underlying philosophies, legal, political and organisational structures of both. Their constituent parts are whānau, marae, hapū rangatira, as governance as well as the decision-makers from the business arm.

From the derived data the qualitative phase then establishes a start point from which to develop ideas, concepts, insights or even hypotheses to mull over. Every response during the qualitative inquiry will draw ‘why’ questions searching for reason and causality; the latter being any consequential relationships between real and perceived events to ensure quality (Ruiz-Sanchez, Valencia-Garcia, Fernandez-Breis, Martinez-Bejar & Compton, 2003) ontologies. Qualitative research is best suited to small numbers of participant where the individual narratives are captured. It is effective in reaching culturally specific information about values, opinions, behaviours and the social context of the selected group (Bishop, 1999). The ontology and sub-ontology represent formal naming, data definition types, and the interrelationships of entities of each of the above components. Quantitative Data deals with quantity or numbers. Creating that sustainable tikanga decision making mechanism is dependent on the data ontologies holding values and counts expressed in numerical term that guarantee AI performance. These are the ontologies *for* IS that is actioned by AI.

In Chapter Two, He Patai© is described as a machine. The Bachelor of Computer Science degree taught how to design, program and implement an idea into software to be executed on an inanimate object such as a computer. He Patai© fundamentally is no different except that

⁴⁰ Implies long-term quality through developing high-quality IS ontologies. It is possible through lack of due diligence to create poor ontologies.

AI provides it with a level of intelligence that is controlled by software written by a human being. Off-the-shelf software required to operate He Patai© presently exist; the tailoring of AI to meet hapū needs requires populating ontologies with hapū centric data. The method of doing that is in the software documentation described earlier (Langer, 1997).

The ontologies *of* the IS (He Patai©) as well, monitors its own performance through simulating and generating performance statistics using the data supplied from external sources or generated within its internal tables. The performance data is displayed on the He Patai© owned dashboard.

The qualitative research methods used for collection are:

- a) Survey
- b) Experiments
- c) Observations and Interviews

Mixed methods research designs take advantage of multiple ways to explore a research problem. One such way is through triangulation, to study the phenomenon through different methods (Konecki, 2008, p.14-15; Huettman, 1993, p.42). Sample sizes may vary based on the methods used or, on the technique used by the researcher. The advantage of mixed methods from my IT / IS experiences is its usefulness when unexpected findings arise from earlier research and that would position the research in a transformative mode. However, if not executed correctly, could weaken the overall design and the physical and logical structures causing inefficiencies when using different data types. In It / IS, a risk assessment on both approaches were needed to be undertaken as part of the overall design phase for the project.

The research participants were a culturally diverse group comprising hapū members, a Mandarin / Cantonese speaking former senior New Zealand diplomat based in the PRC, and, several Chinese entrepreneurs in New Zealand, Chinese-owned business in Malaysia, and of

course in Singapore which is 76% Chinese descent⁴¹. The period of study was from January through to November 2016. The number of participants was small based on a national population of 4.1 million and the niche market being relatively new and exploratory. According to the two Confucian-based business researchers / practitioners Ang and Low (2012) sample sizes larger than 30 and smaller than 500 are appropriate for business research. Qualitative studies prefer small sample sizing (Cavana, Delahaye and Sekaran, 2001: p. 279; Sekaran, 2001: p. 296-297 and Roscoe, 1975).

The hapū corporate tools of E-learning and He Pātai© that are demanded by tikanga are to be developed based on the feasibility studies conducted through quantitative research test theories. The cutting-edge technologies are expensive, and their success lies in selecting the optimum system to meet the perceived need. Their feasibility lies in the analysis and planning (Knight, 2005) from the performance figures, costs and benefits will be computed to ensure the best Return on Investment (ROI) for the hapū shareholders. The technological tools require testing theories, relationships, effects and causes, that are descriptive, correlational, casual comparative/experimental, and the experiments through all aspects of the development to provide the variables for the ROI calculations (Creswell, 2009). Foundation, led by this researcher and the design team will conduct performance measuring from data simulations using quantitative research to decide whether to create the business case using case-based studies to also determine whether the tool would be exclusively for my hapū or, a turnkey (buying the base-line computer platform then have it modified to meet our needs) project that will offer the same services to a number of hapū on a subscription or cost sharing basis.

⁴¹ Singapore Demographics Profile 2018. Retrieved from https://www.indexmundi.com/singapore/demographics_profile.html

Another distinguishing aspect of the professional doctorate format in this instance is that the researcher is creating a *new* business concept, and who will as the practitioner, act on all aspects of the innovation from the conceptual model to the roll-out of the final product.

Research versus common sense

Researchers Whitely (1984) with Gill and Johnson (2002) present the conundrum that some researchers face at the presentation of their findings. For IT/IS and presumably other disciplines, parameters are articulated at the outset with the researcher's remit to execute the research promptly and professionally. In the real world there is an ongoing dialogue between the parties mainly to clarify any points of concern or, where the researcher feels an aspect of the requirements could be improved on to deliver a better quality 'product'. The IT researcher also had deadlines to meet. Extending the scope has cost implications for the client and of course, the contract for time is money.

This research had a case in point with the Dr Ngata's request. A 'real' conflict between intra-hapū bodies that naturally required a tikanga based resolution. A wānanga audience from my region proposed a 'common-sense' resolution. Of the 'social' wing of the hapū body dictating how its business unit conducted its commerce based on a vague notion of being 'socially entrepreneurial.' When pressed, they suggested that the commercial arm operate without profit for the notion of profit was deemed 'dirty'. When conversation turned to developing intergenerational wealth, restoring te reo education and job training there became an awareness for the need for an income stream. My own hapū had had history of being led by entrepreneurial rangatira during the nineteenth century but today the vestiges of colonialism that include dependency are still deep seated. Hapū and this research formulated ⁴² tikanga-a-hapū based

⁴² Remember Mead (2003) teaches that in tikanga there is an *A* and *the* position.

resolution by mapping out on a solid whiteboard in a classroom using te mita-a-hapū, algebraic expressions, New Zealand parliamentary legislation (Trust Deeds), top down IS techniques based on Langer (1997) and Mead (2003) to counter the ‘common sense’ proposition.

In another region one educated leader saw research as just another costly ‘academic exercise’ undertaken by those who are unfamiliar with managing people and of the challenges faced by leadership and their business managers.

From the IT experience, when implementing the recommendations of our research we noted that some managers did not know how to use research findings to fully gain the benefits and conclusions of research. To the point of interpreting of research findings Ghauri et al, (1995) expressed a view that,

research in business studies and managerial problem solving are not much different from each other . . . managers need to have some knowledge and evaluation capabilities to understand the consequences of their decisions . . . the systematic procedures and approaches of advancing knowledge, suggested by the research process, also to serve as a discipline and systematic procedure for managerial problem solving.

This research thesis project involved three languages (Te reo, Chinese Mandarin and English), their cultures, and three sets of underlying philosophies (tikanga, Confucian and European-based legalese, scientific and culture). There was frequently the need for a ‘to and fro’ exercise to search for and clarify any perceived nuances within each. I needed to distinguish between what is ‘common sense and beliefs’ within the context of each partner’s space.

The IT experience taught cultural practises such as in one region of the world where staring directly at someone in the eye was not OK. Whereas, in the US and Canada the lack of eye to eye contact may be perceived rightly or wrongly as you are being dishonest or untrustworthy.

Sometimes despite the best research data returned in a questionnaire to the requestee there are challenges beyond the researcher for some findings may at first be puzzling until the cause and effect of any potential failures are examined in detail. The following illustrates such a situation:

A man and his son are involved in an automobile accident. The man is killed and the boy, seriously injured, is rushed to the hospital for surgery. The surgeon takes one look at him and says, "I am sorry, but I cannot operate on this boy. He is my son. (Seltiz, Wrightsman & Cook, 1976: p. 4).

Gauri and Grønhaug (1995; p. 109) illustrate the catch this way, "we unconsciously believe that a surgeon is always a man and therefore do not even consider the thought the surgeon can be the mother of the boy."

Kaupapa Māori theory in the research framework

While mixed methods were used in this study, the primary method is qualitative guided by Kaupapa Māori theory as developed by several well-known Māori academics (Smith, L. 1995; Smith, G. 2003; Pihama, 2001; Bishop, 1999; Irwin, 1994). The interviews at the hapū, whānau and marae levels was to understand their inter-relationships in the how, why, what, when and where, by collecting whakapapa, whakatauki, and pūrākau in which to create and the update the knowledge base for He Patai©. Hapū governance corporate presented their dreams and aspirations towards developing strategies to develop viable commercial products and expanding trading links.

Mātauranga-ā-Māori

Also, known as Māori knowledge, the beliefs of mātauranga Māori are like those of indigenous knowledge, where everything in the natural environment is interconnected, and has their own wairua and mauri (Durie, 2005). Mātauranga Māori as a body of religion, mythology and reality, is considered tapu and belongs solely to the iwi and hapū who are the possessors of that knowledge. Even today there are Māori with apprehensions about just who should be in the possession of Māori knowledge. Further debated is whether it should be given to Māori as a collective and especially whether it should be out there in the global arena (Durie, 1994). So, important is this knowledge to iwi and hapū that it is generally passed on to others who are thought ready to receive it, and who have displayed the necessary skills to respect it. Cited by Warriner, (2009).

The Insider and Outsider Perspectives

As Māori raised in a te reo Māori-only home qualified my researcher's role as an insider on matters relating to whanau and the Ngāti Te Ao hapū. Work experience in Asia and a student of the Mandarin language did not count towards an 'insider' status however, it gave me an appreciation of cultural sensitivities, nuances and body language interpretations to obtain the benefits from this research. These advantages are an integral part of the research process (Smith, 1999, pp.138-142).

There were caveats attached to having 'insider' status such as not making assumptions or, taking for granted that what is being said is already known to me, the researcher. There was also the need to allow the non-English interviewee time to translate and internalise before formulating a response. As alluded to, reading body language correctly is important for it comes with experience. These factors must be considered during the interpretation, analysis

and writing up the research findings. The researcher must be neutral and objective placing aside any beliefs, values and biases to not shape the inquiry at any level. Follow-up questions must also be permitted to clarify any points not fully understood.

Western research theory state that the researcher should not be personally involved in the research; that an “outsider” is better able to observe and interpret behaviours as being of interest, or important (Davies & Dodd, 2002; Bannister & Riahi-Belkaoui (1991). This in sharp contrast with Smith (2003, p.14-18) to Kaupapa Māori theory supports that the outsider approach to research does not work when working with Māori people due to Māori distrust of researchers, the inability to correctly understand certain behaviours, the possibility of missing certain nuances which do indicate issues of importance and the inability to relate to the participants.

The insider knowledge for the sociology (non-Information Technology and Information Sciences) component of this research helped me better understand the sociological and philosophical worldview and epistemologies of Māori (Smith, 1999), and supports what Porsanger (2004) argues of the subjective research in Western theories and scientific modelling that requires indigenous researchers to sit on the outside and to record their research findings from that position.

Smith (1999) asserts that many Western frameworks call for objective research to be conducted from an outsider’s viewpoint to prevent bias. It is an imperative that in order to be transformative, the Māori worldview must include their stories and histories to be authentic (Rigney, 1999; Smith, 1999).

Research Model for Confucian Ethics

Low and Ang (2013a) stressed the core beliefs, ideas and things people emphasize mostly in the research model shaped by Confucian ethics. They stress showing care and concern for the people; and this includes employees or labour. By Adopting a humanist (Pinyin rén) approach (Low, 2011), Confucian leaders / managers must strive for good virtues, integrity and character; human-orientated; concerned for being socially responsible for those who they lead whether they be colleagues, employees and to their families.

Confucian ethics can also be categorised into three sections, namely, self-development of a leader/manager, his or her relationship with others and social responsibility of manaakitanga and whakawhanaungatanga.

In conducting cross-cultural qualitative research underpinned by Confucian Ethics in the South Korean context, Park and Lunt (2015), stressed the many attributes highlighting the concept of *mianzi*, in Chinese, as one to be conscious of. Lack of respect or whakaute for a person in the social or business situation would result in the breakdown of the relationship / guanxi / whanaungatanga. Issues of technique for culturally proper encounters were underlined by the same authors wherein the nature of the Confucian societies present potential conceptual epistemological ‘gaps’ between methods and implementation. This would also apply to the Māori trader with any of the Sinic partners. A further caveat expressed by the same authors was that cultures are not static, and that care should be taken to avoid essentializing and freezing culture.

Applied Research Methodology (AR)

The IT and IS industries recommend this methodology for it involves close client relationships that sometimes goes even beyond the life of a contract (critical to possible future work being

performed). Evidence is the creation of so-called User⁴³ or ad hoc groups. Today after 50 years it still holds annual conferences with former clients. There is the promise to create *new* knowledge towards the advancement of professional theory and practise in the industry. Started by the airlines it now includes banks, shipping, credit-cards and a US government agency Internal Revenue Service (IRS). This research project views such a relationship using AR with the Iwi Chairs Forum.⁴⁴

At whānau, marae or private small business levels

Te Puni Kōkiri is a central government agency (Māori Business Growth Support, n.d.) charged to offer AR with kaupapa Māori support to whānau and marae and hapū to create the sound small business infrastructures necessary to secure realistic financing arrangement that contribute to the long-term viability of Māori. There is a step-by-step plan with the outcome being a business plan that details the vision, mission, and goals of the enterprise that potential funders demand to ensure their investment is secure. Bishop (1998), describes this approach as whanaungatanga driven in relation to his Kaupapa Māori research emphasizing an approach where the interests, the problems and the preferences of the whānau are what drives the research process.

For the governance of a hapū exporter enterprise

In building the business case for the hybridity (Uz, 2014) that will execute the tikanga-based business plan, AR promises to fill-in knowledge not known when determining leadership for the enterprise at governance, executive and the shop-floor levels. Its application is ideal for solving everyday supply and industrial relations challenges. There is a prompting to seek new

⁴³ I am a member of the TPF Users Group formed in 1969 by five airlines. Its purpose was to discuss automation in the airline schedules. The product common to all was created by IBM©.

⁴⁴ Sharing the vision of Kotahitanga. Nau mai, haere mai, tatui mai. Retrieved from <https://iwichairs.maori.nz>

knowledge and to address real-world issues forcing people to examine their own knowledge base, and to critically reflect on how they perceive and interpret the world, rather than on others (Kemmis, McTaggard & Nixon, 2014).

The He Pātai© data base has in addition to the mātauranga-a-hapū partition, an Operational Research (an analytical methodology for business problem-solving and business decision-making) capability created through AR to support the corporate mission statement. It prompts governance to be proactive in conflict resolution on tikanga⁴⁵ issues (Rog & Knickman, 2004).

Observation as a systematic method within applied research methodology

As mentioned earlier, my upbringing was in a te reo Māori (me ōna tikanga) only home located in a Māori-only village in a remote part of Aotearoa. From this bi-cultural and bi-lingual (officially in 1987 – and tri-lingual with New Zealand Sign language in 2006), country I learned how to mentally observe and record and analyse behaviours and interactions essential to my career in IT and adjusting to several international fronts over the next several decades.

As in life, surroundings and settings varied, some markedly from the tranquil and peaceful setting of the Kiwi family home; thence to a combat zone as a twenty-year old combat soldier; through a government agency with an international reach and finally settling for a professional IT career in the US, Europe and Asia. Returning to Aotearoa New Zealand after 35 years, to undertake this research.

That IT experience may have been the specialised training necessary that Baker (2006. P. 187) articulated when deciding to utilise the observational research. The suggestion was thus:

observational research differs from the other methods in that it requires the research to have more specialized training on how to observe, what and how to record the data, how to enter the field and leave it, and how to

⁴⁵ A programmable feature of AI in He Pātai© is its ability to utilise unstructured inquiry in AR mode.

remain detached and involved at the same time . . . would need to be highly skilled to perform accurate and ethical observational techniques.

Language utility, a systematic method within applied research methodology

Ko tōu reo, ko tōku reo	Your voice and my voice
te tuakiri tangata	are my personal identity
Tihei uriuri, Tihei nakonako	(Not translatable in English)
(Te reo Māori)	(English translation)

For decades US multinational corporations have used native⁴⁶ speakers who were born in or near the target country to front their sales and marketing efforts. This was further strengthened at the technical supervisory level and maintained throughout the life of the product development culminating in providing chargeable services in the maintenance role.

Closer home in te ao Māori was the Late Judge David John Ambler (2008) who utilised te reo in his role. Elsewhere in this thesis I describe Judge Ambler's proficiency in te reo Māori (me ōna tikanga) and by extension, tikanga Māori, who was able to articulate his legal judgement with cultural narratives.

Professional and social experiences show that having a workable knowledge of another language makes one cognisant of other characteristics and values unknown to one's own cultural heritage. In personal terms, it also removes what could be described as disadvantage barriers – receiving a favourable price after greeting a merchant and completing the business transaction in their language.

For AI purposes, the comparability of data collected from different countries / cultures on the same subject also needs to be examined, evaluated and documented. The source and the

⁴⁶ Is someone who learned to speak a language as part of childhood development. Their language was usually the language spoken by their parents or the language of their country of origin.

information collected should represent the same meaning and interpretation. In Information Technology, it did: in the corporate culture it did also.

Both should be equally reliable and correct. Diversity in culture, language and methods of communication between the respondents and researchers can also lead to misunderstandings and misinterpretation (Craig & Douglas, 2000; Ghauri et al, 1995). All authors recommended the development of an equivalent or comparable measure and the interpretations of the data to be collected. The hybridisation of mātauranga Māori and Confucian virtues in this instance provides the first step in this function. The Foundation as the vehicle that drives this research has researchers and trustees with the academic and linguistic qualifications to support these functions.

Systems Development and Life Cycle

The ES with AI conceptual design, development, stress testing, quality assurance, and implementation is based on the proven Systems Development and Life Cycle (SDLC), a methodology developed by Yourdon (1988) that revolves around seven principles. Within the conceptual phase of SDLC is an interpretive quantitative approach used to interview the ‘experts’ or current practitioners of the functions to be automated through learning the existing manual step-by-step methods. They then, following the implementation of the ‘new system’ become the ‘keepers’ of automation (Elliott & Strachan, 2004).

Data Sources for Analysis

Quantitative data in numerical representation came from the central government official records such as the Minutes of the Māori Land Court and on the public domain, particularly, the iwi owned portals. Their veracity or accuracy was determined through certificates of

notarised memoranda supplied by the various owners. The Ngāi Tahu iwi portal presented the most comprehensive display of data that was easily cross referenced with Annual General Meeting information published for the benefit of their shareholder at hapū and marae level. In some instances, the archival research included the legal data bases of such as LexisNexis New Zealand© and the New Zealand Legal Information Institute© were not exhaustive but enough to support the case studies.

The Interviews

In-depth semi-structured interviews were used (Krivokapic-Skoko & O'Neill, 2011) because they supplied the ability to collect data on personal histories, perspectives and experiences. Similarly, Konecki, (2008) and Whiting (2008) saw the advantage of this method or technique for it could be utilised to obtain feedback and offers the opportunity to reveal issues that hitherto not identified in the literature. Separately, Whiting, (2008) extolled the advantage that allowed interviewees to express their own opinions, to highlight any fears, concerns and feelings. More importantly, the technique allowed the conversation to flow where it needed to be in order to deal with issues as opposed to interjecting that would cause the dialogue to flow and stray from a pre-determined approach to the topic. Open-ended questions are also designed to guide the conversation (Letherby, Scott & Williams, 2013; Whiting, 2008; Davies & Dodd, 2002).

After requesting demographics, the questions covered a range of topics including the subject's views of leadership, early influences, role models and mentorship if applicable. Comments made 'off the record' were respected with a mental note made to help develop a holistic picture of the interviewee for, it may expose values which it embodies.

All interviewees were asked how they viewed leadership, competencies and characteristics needed of the role of CEO or chairperson. The question of whether nepotism was acceptable was asked, with an expectation that some compelling reasons to support that notion would be

offered. Interesting responses came from the question of whether there is a role for non-Māori in hapū leadership.

The disadvantage of this method is that the task of data analysis is time consuming and resource intensive (Krivokapic-Skoko & O'Neill, 2011; Whiting, 2008; Davies & Dodd, 2002).

Selection of participants

There was a wide range of participants from small business owners to the hapū members at the marae. A retired and well-respected New Zealand diplomat, a participant in the negotiations of the New Zealand China Free Trade Agreement gave of his time generously. It is said that the interview process must be an active and collaborative effort and a powerful way of understanding others (Fontana & Frey, 2005: p. 696). Over a thirty-five-year IT career spent over five continents all interviews were conducted face-to-face. The client's first language in most cases was not English. Add to that were the subtleties of the cultural differentials and of course, we were in their space that had its own set of rules and protocols. The same approach was adopted for this research. Where te reo Māori (me ōna tikanga) was required, it was used alongside the appropriate kawa and protocols. Interviews with Chinese respondents were conducted consistent with the Confucian virtue of guanxi. The Foundation's Mandarin speaker who graduated in New Zealand and has since returned to the PRC was utilised where necessary to understand the nuances. In Malaysia and Singapore both English and Bahasa Melayu (national language of the Federation of Malaysia we used as SAS soldiers during 1966 and with government service in 1970's while based in Singapore) was used interchangeably with English where necessary for the purposes of clarification and verification.

There were many unsolicited opinions received on the various marae but they could not be used for this research although they were mentally noted for the possible inclusion in He Patai©

to contribute as nuances towards a holistic view. This practise is widely used in an investigative career for collecting evidence where it may, or may not, be material to the civil or criminal case being investigated. The candidate list was drawn up from the following:

- Through hapū panui notices, membership lists and the public domain.
- Acceptance of an in-depth semi-structured interview process by key Individuals.
- Through data collection techniques, surveys during the interview process.
- Surveys

To meet that criteria a list of 20 potential interviewees was drawn up and participants were selected from the following categories:

- hapū leaders from Pukepoto
- rūnanga chairperson
- Chief Executive Officers
- Iwi corporate executives
- SME
- Is willing and available to participate
- Aotearoa New Zealand Trade Diplomats with China experience.

A budget was prepared to travel throughout Aotearoa New Zealand. SIRF© was utilized as an instrument to obtain travel funding to demonstrate the connectivity between the two cultures. The goal was to interview both women and men in leadership roles. Ten participants were sent letters of introduction by New Zealand Post and by email. There was a brief outline introducing myself, the research project, and an invitation to participate in a kanohi-ki-te-kanohi (face-to-

face), one-on-one, semi-structured interview. A participant information sheet with a consent form for participation was sent via NZ Post and emailed to ensure the potential interviewee had a clear understanding of the purpose for the research preparatory to the interview. Follow-up calls and/or emails were made to each participant confirming their participation and setting the time and date and place for the interview.

Matua Heke Puhipi, the leader from one of the three hapū in Pukepoto - Te Uri o Hina replied promptly to the request for an interview.

The office of the Kaiwhakahaere (Chairman) for Ngāi Tahu and Rūnanga Chairman for Ngāi Te Rangi, and the Kaiwhakahaere of Māori Relations with the Whangarei District Council responded positively making time and their senior officials available. Follow-up emails and letters were sent to the rest.

Practising the Confucian virtue of guanxi in Aotearoa New Zealand

Meeting fellow students and their parents at the Whangarei Chinese Language School lessons each Saturday morning provided ample opportunity to practise guanxi, the art of developing relationships based the teachings of Confucius. Attending the Chinese Lunar New Year or Spring Festival and regular patronage of the many restaurants over the two years prior to this research developed a friendly relationship with the nations that subscribe to Confucianism whether from Vietnam, Cambodia, Korea, Japan, Malaysia, and Singapore.

Creating the culturally sensitive setting for the small business owner

When asked to ‘talk’ about their family businesses most were shy, but all offered positive experiences on being immigrants to Aotearoa New Zealand. The research approach to those who clearly came as refugees from Asia was the same for all. While some had escaped the tyranny and had spent months in ‘holding camps’ it was their promise and references from their

cultural organisation within this country that enabled them access to lines of credit to establish themselves in business. To most having come from oppressed states made them reluctant to sign any forms such as consent and there was definitely a prohibition on the use of recording devices, but they were prepared to chatter at their places of business in between serving customers. Note: there were two audiences. One for this scholarship that is bound by the rules of academic ethics and secondly, my hapū needs to populate their data base for the purpose of hybridising cross-cultural knowledge.

Creating the general setting

The research objectives were articulated at the beginning of the interview. There was an announced time of sixty minutes with a proviso for a rescheduling if necessary.

As managers of businesses their time was valuable. To save their time my questions were sent well before the interview enabling the interviewee to do any research and to seek any clarification.

Being the interviewee: an executive's strategy for protecting tenure

Media strategy⁴⁷ was part of career training following the MBA program and subsequent elevation through the ranks of the executive and governance levels. The rule-of-thumb was to “reveal” only that which was already out in the public domain. Then, when prompted by an interviewer, carefully releasing the underlying reasons for the successes of the organisation: not a tad more. This I quickly recognised with the CFO interviewee.

⁴⁷ A plan of action to guide advertising and marketing. How to target an audience successfully to grow business. While the specialist spokesperson has that role, it is also incumbent on every executive to represent the corporation by controlling the flow of information. While journalists are taught techniques and protocols ensuring continued access, an ad hoc person such as a researcher does not operate under the same constraints, although in fairness, a researcher is bound by the academy's ethics.

Contrast the ‘game’ with that of a previous role as an IT researcher whose purpose was to find structural weaknesses and to recommend solutions. There, both executive and governance practiced candour, to be honest for they had a vested interest in producing critical information that may include features or qualities not appealing or attractive. Why? Because, their governing board was making a multi-million-dollar investment in IT to improve the enterprise’s profitability.

Limitations on choice of cases to interview

In traditional business practises where there are specific and complex issues it is recommended that a bigger firm be selected for it is assumed they would have far more experiences in the more complex problems (Gauri et al, 1995; p. 113) and theoretically, have greater in-depth knowledge on a particular issue.

Ngāti Tahu Tourism was the only tikanga-based iwi owned corporation actively trading with the PRC, and whose CFO responded to the invitation.

When questioned whether one case is enough for a research project, Mintzberg (1979: p. 583) responded,

what, for example is wrong with a sample size of one? Why should researchers have to apologize for them? Should Piaget [an influential philosopher-psychologist] apologize for studying his own children, a physicist for splitting only one atom?

It is the researcher’s problem and the research objectives that influence the number. In this my case, the single candidate was the most experienced and successful leader in Māori corporate circle and had received a national award that week.

Present day iwi & hapū business executives

Their corporate officer ranks met the threshold for transparency and objectivity. Race, ethnicity, gender, or the religion of the candidates was immaterial for leadership. That diversity was tikanga based, with the proposition that if and when a suitably educated and competent hapū member was available, then she/he would be in competition for any leadership role.

Final list for interview

Five finalists confirmed their participation and signed off on the consent and disclosure forms.

They were:

- A rūnanga chairman with a Master of Business Administration Degree and considerable service within the New Zealand Public Service sector prior to returning in preparation and the implementation of their historical treaty claim.

- The Chief Financial Officer from Ngāi Tahu Holdings©.
- An executive from the Māori-owned Aotearoa Credit Union©
- An Iwi Relations Manager with the Whangarei District Council.
- Former New Zealand Diplomat with extensive China experience.

Note: Pursuant to Appendix 'B', the Covering Letter for Participants and found at the latter end of this thesis, the rights and protections were articulated to each participant on receipt of their consent and signature. Then there were those who I have known for years from the Chinese, Vietnamese, Korean, Japanese, Singaporean, and Malaysian Chinese communities (in New Zealand, Singapore, Malaysia, and the PRC) and for personal reasons did not sign up, but

still wanted to share this hearsay⁴⁸ for the mutual benefit of the Māori importers / exporters. Their material was critical to the efficacy of He Pātai©.

Analysis of data

Raw data derived from various media was collated then transcribed. Dialogue was validated to ensure the translations of the Chinese, Māori and English languages used were free from error, oversight and indeed accurate (Kothari, 2004). The Foundation's Chinese trustee who was born in the PRC and graduated from Northtec©, a New Zealand Quality Assurance (NZQA) tertiary institution and based in Whangarei, sat in on the informal interviews at the various informal settings.

While being assisted particularly with the foreign language components, it is still my responsibility as the researcher that every piece of data collected had integrity, was correct for any discrepancy would show up in the AI responses creating unsustainable tikanga responses.

Purpose for data collection

Data is the fuel for AI, (Artificial Intelligence (AI) is arguably the most popular technology topic of our time, n.d.) for it describes:

the cognitive function of humans (and animals) of becoming aware of situations, learning from them, and applying the learning to make decisions and solve new problems. It includes one's capacity for logic, understanding, self-awareness, learning, emotional knowledge, planning, creativity, and problem-solving.

⁴⁸ Defined as a statement other than one made by a declarant while testifying at a trial or hearing. Hearsay is inadmissible unless in this thesis.

For the business enterprise (Ghauri et al, 1995: p 103) the findings from data collection should reveal at least the following six things:

1. Brings objectivity in the decision making.
2. Measures a baseline, benchmarks and expected targets to stand against the competition.
3. Helps in doing a Cost Benefit Analysis if a solution is costing more than the problem.
4. Will help the corporation to confirm a perceived size and intensity of a problem.
5. Confirms or disproves current thinking.
6. To act on what you discover.

Corporate alongside hapū internal data (mātauranga-a-hapū) delivers value to whānau. This, however, is dependent on having the competent analytical infrastructure rendering its full potential, using AI. Tikanga based programming creates the internal calculus to solve the business challenges including the notions of *power* and *wealth*, with its intra-hapū and external partners.

Interpreting statute as data: trade pacts after ratification become national legislation

In 2008, the China and New Zealand (NZ-China Free Trade Agreement, n.d.) Free Trade Agreement was concluded and provided each partner with favourable access to each other's markets. Moreover, dispute resolutions were embedded to resolve most issues, emanating from the interpretation of the textual content. Furthermore, both countries have membership in the

World Trade Organization (WTO)⁴⁹ with New Zealand being the first to agree to China's accession to that body.⁵⁰ The latter gives access through what is known as a regional trade agreement or preferential trade arrangement.

Data defines the who, why, when, which & what we are as a hapū. AI's uses that data to determine the 'how' to meet our needs based on tikanga.

So, what does all these forms of data mean to hapū? It is incumbent on hapū, this researcher and Foundation to develop the questions that will draw value from each data category otherwise, on their own, they serve no purpose. Data are not knowledge according to Bonaventura (1997, p. 83) but raw material for knowledge creation, for there is no inherent meaning in data, it is raw material for information.

An overview of the data collected and of published conceptual frameworks offered

There were no published findings on tikanga based AI operations or, explicit Sinic-Māori governance conceptual frameworks. The exemplar's tikanga-a-hapū corporate models were uniquely Māori and not what Giddens (1990) described as "Westernised" based on tribal management selection policies. While some corporates may have in some instances non-Māori executives, the governance operating philosophy asserted its own cultural, economic, and political influence, of not being European or North American based.

The exemplars, each with their unique corporate governing cultures consistent with their hapū core tikanga beliefs as well as being multi-billion-dollar trading corporations would I assume be models for Māori. Moreover, each was positioned to adopt the narrow (Uz, 2014) approach

⁴⁹ Retrieved from https://www.wto.org/english/thewto_e/countries_e/new_zealand_e.htm

⁵⁰ Retrieved from <https://www.mfat.govt.nz/en/countries-and-regions/north-asia/china>

to polarisation and hybridisation theories using common attributes such as guanxi and whakawhanaungatanga as a component for negotiating strategies with potential Chinese partners.

Data collected is to be integrated to form a database for verification, validation and application through the Case Study methodologies by the analysis of key aspects of planning with the inclusion of commercial, cultural, ritual and Kaupapa Māori for the decision makers such as the governance and executive user.

Those who might benefit from this thesis would include:

- The academy.
- Policymakers at Te Puni Kōkiri (Māori Business Growth Support. (n.d.).
- Decision makers responsible for allocation of resources at TPK (Te Puni Kōkiri, 2002).
- Scholars of historical antecedents to current and future agreements

It is the hope that the analysis presented is useful to those communities and others interested in promoting Sino-Māori trade or, other trade relationships with those civilizations who deem themselves as being “non-Westernised.”

What prompted the research on this topic?

Confucian Virtue Ethics experience from the secondment to the Chinese corporation and the advances in ES particularly with AI, grabbed my interest. Then its daily use by Citifinancial© part of the Citibank, my penultimate employer in the IT/IS section.

Recent findings by Uz (2014) on the mechanism to resolve issues and the complexities of cross-cultural.

A discussion with the leading Māori corporation who has international subsidiaries gave the final impetus for this research

Data collection methodology

Invitations for one-on-one interviews were sent out accompanied by the questionnaire.

Significance and justification of the study

This research set out to create the infrastructure and to develop tools for the Māori corporation contemplating the exporting of their products and services to China. The literature review did not reveal any published results on the subject, but it did reveal (Uz, 2014) a framework to develop business relationships based on mātauranga-a-hapū as the underlying philosophy. Mead (2003) is critical to how the ES and AI perform the decision-making roles for governance and management.

Research ethics approval

Consistent with Te Whare Wānanga o Awanuiārangi ethical practices, an application for the Approval of Proposed Research to the Ethics Committee was submitted at the outset of the project. Any potential ethical issues were discussed on the sample group of Māori, Chinese and New Zealand born European respondents. The potential issues of anonymity and personal confidentiality were resolved. Informed consent, the permission granted in full knowledge of possible consequences were also clarified with the possibility of the respondent's withdrawal at any time. Cultural issues around Māori and the Tiriti o Waitangi were expected but did not eventuate.

The Foundation's trustee who provides the Chinese input for the development of He Patai© was also consulted to protect cultural sensitivities.

Consistent with tikanga Māori, the interviews were carried out in te reo rangatira and English, and at the request of the interviewee. The concept and processes of 'organic' tikanga Māori originally advanced through personal communications by Matua Charlie Tawhiao, was explained at the outset of any interview or korero. It needed to be articulated through presenting scenarios and the suggested places where it could be used. The general opinion was that it presented flexibility in discussing relationships such as the iwi rūnanga / iwi holdings situation and relationship. The same concept was also conducive to the cross-cultural nature of this project. One leading, non-Chinese (Bol, 2012) professor on Confucianism had offered a perceived equivalence that will be elaborated in the discussion chapter. It was also seen as being tikanga based and aided in developing the dialogue on the contentious issues.

The building of guānxi with the partnership interviewees had been developed over three years through business contacts, attending Chinese New Year functions and as a student of Mandarin Chinese at the Whangarei Chinese School. There was however a general reluctance on their part (with a characteristic smile) to sign any papers as part of the dialogue. The same reluctance was found during conversation with iwi and hapū members in the Tai Tokerau rohe. Much of their dialogue was carried out in Māori. The Ethics form was transmitted as part of the invitation to be interviewed with its contents reviewed before dialogue commenced. Ethical considerations that applied to each interviewee and their culture were cautioned to ensure all protocols were in place for the three cultures.

Informed consent

The legal aspect of consent, declaring the relationship between the academy, the interviewer, and interviewee was explained so was the purpose, to effect dialogue. The ethical aspects and confidentiality were outlined, and this included the right to view and validate any transcripts. Each interviewee concurred before proceedings commenced.

Personal communications

While the many unsolicited opinions on the marae were relevant and important indicators to this research, the fact was they were unrecoverable, therefore could not be documented. Nonetheless, on the less contentious issues such as how they perceived qualities of leadership, these were annotated accordingly in the Findings section. Where opinions were found credible, the offer was made to the hapū member to be interviewed formally with an exchange of signatures but was rejected for fear of retribution. Negative and positive opinions became part of the discourse. Care was taken to be respectful when handling comments such as “ka takahia tana mana.” as trampling on the prestige of the individual. As Mead (2003) expressed it this way, “in the end, it is up to the individuals to decide the shape of their lives and what they want to do.” Everyone in the hapū had the right to contribute regardless of their personal background as a principle (Smith, 1995; p. 120) for it shows respect and interest to the grassroots and for they should always be part of the discourse. As both an ‘insider’ from the hapū, and an ‘outsider’ with the Chinese entrepreneurs, I was still bound by the ethical processes of the academy.

Research Procedures

The final 'sit down' list interviewees were of senior level iwi leaders and business leaders. There were general questions and follow-ups were tailored based on their background and experience.

Conducting the Interviews

The Te Uri-O-Hina, hapū of Pukepoto kaumātua, Matua Hek aged 84 delivered a comprehensive narrative of the history and whakapapa of Pukepoto from the Puhipi (Busby) perspective. The subject of the cult of Io, the supreme being was raised and so was his personal wairuatanga (spirituality), of self-belief, and shared esoteric knowledge was wrapped up in a marathon of over sixteen continuous hours. His was the only formal input from hapū, other members would communicate by personal communications.

Cross-cultural perspectives from the rūnanga chair with tertiary business qualifications and public service brought unique viewpoints on the application of tikanga from both careers.

An investment bank manager who articulated a unique kaupapa Māori engagement by the parent corporation for their mix of private investors and serving the clients of social services agencies.

A Māori and Crown relationships manager presented the Treaty Partner relationship as being a balancing act of fairness to the partners.

Former career diplomat with considerable Chinese experience imparted negotiating strategies for doing business with China.

Hui attendees in te Tai Tokerau rohe were forthcoming with views on the on the continuing treaty negotiations situation with the Ngāpuhi tribe. For ethical reasons their comments were not included as they could not be discoverable.

The local and overseas Chinese businesses people offered perspectives in between serving customer orders at their places of business.

The Interview Process

As the interviewer I am obliged to be objective and not express any personal views that may prejudice the outcomes and proceedings. Whereas my careers were based on meritocracy; leadership in the underlying philosophies held to an individual's place in a hierarchy (vertical collectivism) or nepotism by whakapapa and *xiao* (孝) or filial piety.

The calibre of executives and hapū leaderships was outstanding. Each was at high output who appeared to view the opportunity as an enjoyable, even a teaching/learning experience.

One leader overtly justified nepotism (Waitangi Tribunal, 1987) laying out a compelling case as their whānau had led the major hapū through a national crisis and had their respect. They continue still to this day.

Should that rangatiratanga be challenged, New Zealand's highest Court of record will uphold that perceived inequity as it is a tikanga Māori (Mead, 2003). All is not lost though for those of us who wish to aspire to the commercial holding leadership. There are different options that can be exercised with or without the support of tikanga and will be offered in the discussion at Chapter Seven.

Legal training and mooted room simulations was a reminder of the tendency that when interviewing a person in a very senior role in an organisation that the interviewer should overlook self-contradictions. For that sometimes defeated the purpose, but most if not all, accomplished challenges for knowledge is belief and hierarchal in the structures of the maieutic (the mode which aims to bring a person's latent ideas into a clear consciousness), method of elenchus (eliciting truth by questions and answers, to refute an argument), and elentic (serving

to refute) methods. These principles espoused by Socrates (born c.470 and died 399 bce) with the technique taught at law school.

The opinions of the rank-and-file of any hapū/iwi members were of equal importance and made significant contribution for their personal knowledge, fears, prejudices, and anxiety in response to the thesis agenda. However, for ethical reasons, by not associating a name with a comment therefore making that discourse undiscoverable, meant it was unacceptable for the research. Their opinions nonetheless were kept in mind during the synthesizing of results for future discourse, especially in providing data such as the tacit type for the He Patai© database.

The following questionnaire contains generalisations for some were irrelevant to the interviewee. Some clearly were aimed at the executive, others for the shareholders but comments were useful for the ES and AI.

The leadership questionnaire

Interchangeability: substitute mātauranga with Confucianism where applicable.

1. Why are you successful?
2. What decisions, in order of importance, that you face daily?
3. How does the corporation keep its daily motivation, to inspire despite obstacles, pushback or setbacks?
4. Is it a challenge to create innovative thinking within corporation?
5. How are ideas shared and implemented?
6. As governance, what is most important to you in creating the – mission, vision, or core values? Why?
7. How do you assist a new employee to understand the culture of your corporation?

8. Communication & language:
 - i How do you disseminate policy etc. to your employees, shareholders?
 - ii Do you think that in addition to te reo would another language be an asset? An if so, which one or ones?
9. What qualities do you look to be a better leader?
10. How to decide the best candidate for your organisation?
11. What are the most lacking traits among leaders today?
12. What are the most important traits for successful leadership?
13. What is the important characteristic every leader should have?
14. What pressing challenges facing leadership today? And why?
15. Do you have a mentor? If so, what traits you seek in one?
16. Do you have a routine for personal growth as leader?
17. Does Kaupapa Māori influence your business decisions?
18. Could Mātauranga Māori be used in the export to China?
19. What if any are your daily highlights in life and job?
20. Would you like to add anything extra for this research?

The responses

Overall, the status of the interviewee's historical treaty settlement played a major role in their disposition and responses. Settlement reflected optimism and opportunity, while the lack of progress spelled despondency.

All respondents were offered an hour. The CFO of Ngāi Tahu used fifty minutes for he was running a multi-billion-dollar enterprise. I respected his humility and graciousness (a quality

seen in high performing executives worldwide). Matu Hek did sixteen continuous hours: his offerings covered centuries of Pukepoto (Huria) history and whakapapa, his careers and aspirations.

To one business interviewee, there were questions posed asking as my background was an MBA and having had corporate experience, ‘how did you deal with a so and so situation?’ That included asking the ‘what, why, who, where and how, can we be like that?’ There was eagerness in localising the question. (Two became regular post-interview correspondents on the issues and challenges facing their organisation.)

The remaining interviews with hapū and iwi members were unstructured and open-ended some lasting no more than five minutes. The responses varied whether in a group or individual setting. A college group including their professor constantly wandered off-point often to general points of self-interest and asking, “what do I gain?”

For my rohe of Tai Tokerau, the issue of treaty settlement is largely unsettled and that set the tone for the iwi. Objections were handled with the purpose of supporting their argument with some agreement and others dissenting even more – of the necessary for the interview?

On the issues of globalisation (the direction for leading iwi corporations) the response was consistent with the group having settled claims and interestingly, whatever political party was in power. There was political and economic stagnation mainly in my rohe. As the country was in an election cycle some perceived false narratives supported their notions of rejection of the Tiriti o Waitangi and its Principles of the Treaty and a perceived loss of sovereignty.

Other rohe such as the Bay of Plenty and the South Island where hapū owned businesses, were thriving there was general optimism about the future for their whānau and this was reflected in the dialogue.

After the personal interviews, I was still of the opinion that a ‘survey type’ interview is best used by tele-marketers and not when interviewing executives and leadership. The reasons are

thus: effective executives enjoy constant dialogue to support their stance or to determine where they stood relative to their contemporaries. One sought clarity through the ‘what if’ question that could only be achieved through the interview. The personal interview method project produced substantive, applicable and publishable results for both clients: the academy and ‘backgrounder’ information for He Pātai©.

No compensation, no koha, neither were cups of tea or coffee offered to any interviewee.

Methodological Reflections

Personally, the various research tools and methodologies deployed had a comfort level for they had been used in a professional career amongst diverse cultures, spoken languages, language proficiencies and most of all, the span of educational and experiences of the interviewed candidates. Great care was taken to ensure the interviewee was being respected regardless of their responses. Clarification was asked for and received especially on receiving contrary opinions. (Care was exercised to not offend through the wording of the follow-up question. The smile or inflection of the voice helped. An option was to set down another time when the interviewee could reflect on what was said. The result could be a change of mind or indeed, further reinforcing the original argument.)

Culture and entrepreneurship

Previous experience with US multi-nations on foreign assignments shaped an understanding of what made the interview successful. That was accomplished by the order of the list of question being asked. For after observing the preliminary rituals, the interactions were relaxed, friendly and informal and titles were rarely used for title denoted job function rather than badges of rank or status (the US culture being traditionally relaxed in terms forgetting titles in these

situations - that approach set communication styles.) Trust and credibility were important to the way organisations functioned. Interestingly though, little attention was given to body language, and non-verbal cues until the overseas assignments. There was an expectation that as the interviewer, there were caveats such as not discussing the three forbidden⁵¹ topics. On the other hand, for the interviewee, risk-taking (the can-do attitude) and the entrepreneurial spirit were often the reward for some but not all cultures. Based on their experiences, where applicable, the proposed Sino-Māori partnership had created a complex, successful and rewarding relationship for the partners driven by fealty to their underlying philosophies.

Consistent with Confucianism, the experienced gained in their environment was how eager they accepted extra work assignments without asking for added compensation for the good of the company. Their employee compensation and benefits were invariably above average. There was also an eagerness for collaboration, to build closer links between the industry and academies; the industry benefitted. Besides, the stock market standing reflected the performance of the organisation. Those experiences shaped my methodological processes during this phase of the thesis

The limitations

Cross-cultural interviews were commonplace and seamless in previous careers. Their corporate strategies were tailor-made for the various levels of contact. Initial marketing and sales were conducted in the customer language by native speakers who were US citizens and hired specially for the purpose. Their technical proficiency and functional levels were underpinned in using English as the operational language.

⁵¹ Politics of any kind including office politics, gender and ethnicity.

In the scope of this thesis there were three broad categories researched: Small businesses like green grocers, fast-food, news agents and tour operators; medium size such as stone-fruit growers in the Bay of Plenty; and, large seafood exporters and major tour operators out of Queenstown. Some, not all had used the assistance offered by TPK and NZTE to begin and support these businesses. The interview data sampling was small but seemed to be representational. This research model focused interviewees who were self-disciplined, self-cultivated and a proven record for self-development as an entrepreneur.

Chapter summary

The ethical guidelines for this research project were set up by the committee within the Te Whare Wānanga o Awanuiārangi that held to a Code of Ethical Conduct that we researchers were required to conform to. The approval letter is attached as appendix 'A'.

Kaupapa Māori theory (Smith, 2003) as a research ethical standard acknowledges the relationship between the Māori people. The emphasis on positive management and harmonious relationships in business was based on the Confucian ethical standards (Low & Ang, 2012). The development of He Patai© to produce sustainable tikanga decisions was based on the proven Systems Development and Life Cycle method with specific epistemological and ontologies described by Vallverdú (2014). Each method and methodology deployed set the baselines, milestones, deliverables and inter-dependencies to effect critical-mass that would deliver tikanga-based governance decisions.

Chapter conclusion

The overarching objective described earlier in chapter one was to first research the underpinnings of hapū. Next, to migrate the *philosophical* epistemological and ontologies

(mātauranga-a-hapū) properties to become *Information Science* ontologies and sub-ontologies as artefacts for He Pātai© to generate tikanga-a-hapū based commercial decisions.

CHAPTER FOUR - Case study one – restoring the ties



Figure 12. Te Kuaka

Kuaka/ 斑尾塍鷸/Godwit: Incredible bird embodies ancient bonds

In a press release the TPK CEO Michelle Hippolite (Te Puni Kōkiri, 2013) highlighted the ancient bonds between China and Māori.

Māori ties to China were forged by voyaging tūpuna who left Asia millennia ago, writing the final chapter in the story of human exploration and settling a third of the surface of the planet over 80 generations. Our ancestors followed many guides from nature including the southern migrating Kuaka, the Ban Wai-Cheng Yu. This bird traces the journeys of Māori and Polynesian ancestors back to Asia, back thousands of miles and thousands of years – forever linking the peoples of New Zealand to the Peoples of China.

The case study research question

How to create the sustainable equitable decisions?

Personal preparation:

On returning to Aotearoa New Zealand after three decades there was a need to refresh my mātauranga Māori in the words of Linda Tuhiwai Smith (1999: p. 8). First was te reo Māori listening, comprehension, public speaking, writing and reading for in the past thirty years te reo vocabulary had expanded significantly. More importantly as a researcher, the learning would re-create the right mind set for such a project. The flow-on effect would be revitalisation of the essential marae skills of tikanga, wairuatanga, āhuatanga, auahatanga (creativity) underpinned by raising proficiency in the language, a tikanga according to Mead (2003: p.313) who wrote:

the tikanga of learning' through the 'kawa of learning' ... the practises of learning . . . that all should accept as binding upon them . . . to include beginning with karakia . . . is accepted as a natural part of the learning environment.

The ritual aspects of He Tūhononga

Since September 2017, as hau kāinga we have incorporated the rituals comprising a set of actions performed according to a prescribed order of tikanga Māori and Confucian Virtue in welcoming Chinese business delegations to our rohe. While under the auspices of the Mayor and the Whangarei District Council, the initiative came from us, the retired NZSAS veterans who now form a leadership role.

When describing human performance improvement (Low and Ang, 2013a) cite the Analects of Confucius IV: 13, where the Sage teaches that:

If a state is governed by showing deference what difficulty will there be in performing the rites? If a state is not governed by showing deference, how can the rites be performed.

To further stress that importance of what establishes the ambience, the authors further explain the concepts of rituals, procedures or organizational structures should have their places in the management to ensure order and stability within the organization or nation.

Equally, Mead (2003, p.16) addresses the ritual aspect of tikanga of deference:

trample on tikanga or mangle how they are put into practice will cause misfortune could offend the ancestors and the Gods of the Māori world. There is the suggestion of ‘ritual punishment’.

Mead implies that misfortune is expected to be visited upon the culprits as punishment for offending the ancestors and the Gods of the Māori world.

The tri-lingual mihi whakatau formal welcome speech used in Whangarei

Chinese: 各位贵宾、各位专家、各位同学 中午好。

Pinyin: gèwèi guìbīn, gèwèi zhuānjiā, gèwèi tóngxué, zhōngwǔ hǎo.

Te reo Māori: Tena ra ngā rangatira; ngā tohunga; ngā taurira oti ra tena tatou katoa

English: Greetings distinguished guests, teachers, students, and indeed, to us all.

(Note: the Chinese component was written by the Foundation’s PRC based trustee)

Examining the bedrock philosophical underpinnings

The need was for published scholarship with emphasis on Confucian virtue in English language by practitioners who were also Chinese native language speakers. An intensive search revealed in international education and entrepreneurial journals scholarship authored by Low (2001, 2002, 2005, 2006, 2010a, 2010b, 2011) then with Ang (2012, 2013a, 2013b). Their extensive scholarship provided an in-depth contextual knowledge that provided data for both qualitative and quantitative research based in their roles as academics and business practitioners. There

was still the need for a catalyst, a form of conceptual framework that would bridge the two underlying philosophies. The questions then arose whether that so-called bridge would be acceptable to the owners of both philosophies. Would there be a need to modify bedrock beliefs? If so, how and who would make the changes? Does hapū have that authority? Would the reciprocal party to the partnership agree to their changes? After all, these were ancient belief systems thousands of years old. Qualitative methods were needed to address three fundamental issues:

- Is there in existing scholarship a defined catalyst, if so, is it robust and would it meet the scrutiny of hapū kāhui who has the ‘delegated authority’ under tikanga (Mead, 2003) to make that determination?
- If not, will the scope of this research be widened to develop a catalyst?
- Would changes be needed to adjust tikanga-a-hapū under Mead (2003) framework?

Sanitizing general business principle to ensure bedrock compliance

Conventional (Westernised) business principles were scrutinized against the bedrock principles as a measure of compliance. Then, using the Information Sciences ontologies/sub-ontologies an AI internal directory was populated with a dictionary and thesaurus of items assigned a ‘weighting factor’ of 0 to 5, denoting level of severity. For example, 0 as OK and 5 would be a prohibition, such as a rāhui. Levels 1 through 5 were associated footnote message to indicate

an ‘exception’ that ‘triggers’ executive intervention to override the ‘exception’. These transactions would be played out on a PC or Laptop.

Adopting hybridisation

Uz (2014) prescribed hybridisation as the catalyst for Sino-Māori trade. Politically or philosophically hapū would have to consider a version of modernity that included capitalism⁵² and scientific rationalisation into the corporate philosophy. Hall and Ames (1999: p. 66) wrote that China had their own terms for entrance into the modern world. Secondly, theirs was a nation of industrious workers producing world class products eagerly received in the Western hemisphere. Lastly, all the while their central government preached the Marxism⁵³ / Leninism ideology. Hapū would need to consider a ‘level’ of pragmatism necessary to meet its vision and mission of generating inter-general wealth.

Research methodologies

Tikanga-a-hapū, kaupapa Māori and Confucianism research methodologies were applied to the case study seeking Tūhonotanga of the trade relationship. Tikanga-a-hapū is added to enable the principles of tika, rights, and principles to be framed on the proposed addition of modernity, scientific rationality and capitalism. Also embedded in that discussion is the use of ‘organic’ tikanga.

Data collection methods

⁵² Our (the West) defines as an economic and political system in which a country’s trade and industry are controlled by private owners for profit, rather than the state.

⁵³ The political and economic theories of Karl Marx and Friedrich Engels later developed by their followers to form the basis of communism.

While linguistical and cultural these are two widely different cultures being studied to determine if there is some commonality, so how that could be beneficial to both parties.

The use of three⁵⁴ languages with skilled international practitioners using Langer (1997) made the analysis, interpretation and dissemination of data quite interesting. The mode of gathering data was both formal and informal over lunch or dinner at marae or restaurants in Aotearoa New Zealand, China, Singapore and Malaysia. The Analects 6:30 also describes it as “to look at others and advance their interest while you advance your own – the aim of being a noble man while acting in harmony with each other.”

There was enthusiasm from all quarters for the project objective. The international IT background particularly with understanding nuance and reading body language made it easier too for this new sector is data rich yet information poor.

My personal subjectivity within the case study

Unlike previous cross-bedrock projects, as researcher I have a vested interest in its success for, I feel passionate about the partnership. This is the opportunity to utilise technology learned, developed and implemented outside of Aotearoa New Zealand. It could be described as a personal bias.

The interviews and findings supporting Case study one.

Both partners to the proposed Sino-Māori trade framework pact posited their underlying reasons and arguments to establish their credentials as viable trade partners. One argued in support of mātauranga Māori, the other Confucianism; both having common features in which to commence the negotiations. There are three fundamental points of differences in the Chinese

⁵⁴ A fourth, Bahasa Melayu from the NZSAS & the Sigint days was used in Sarawak, Sabah and the Malay Peninsula alongside Hakka/Mandarin. .

philosophy for trade according to Uz (2014) that Māori must adopt. They being modernity incorporating capitalism and scientific rationalisation.

While not explicit in declaring those same attributes, this research's exemplar in Ngai Tahu Holdings is successful in using their Ngai Tahutanga, as articulated on the iwi website or, as what Mead (2003) articulates in the whakatauki of "Ngā ahi e ngiha mai nei", to do what is necessary to take the challenge head on. The onus is then on this research to seek consensus from Māori social entrepreneurs to articulate the need to adopt the three same principles of modernity, scientific rationality and capitalism.

To the Sino-Māori corporate experience, the matter of whakawhanaungatanga and *Ren*, the Confucian virtue denoting good feeling, a virtuous human experience of ultraism is foundational. Low and Ang (2012) have produced a Confucian body of knowledge to enhance the OECD⁵⁵ program known as the Corporate Social Responsibility, with the Confucius teachings influencing this research.

Both authors articulate the standards linked to Confucius over the years that maybe introduced to Western management ways. Low and Ang (2013b: p.2) describes management tasks as planning, organising, staffing, directing and controlling of people and resources. In growing its talent, the company needs to secure and hire the right quality and quantity of talents and skills as well as motivating and retaining the talent pool.

Organising becomes important particularly when a new strategy is developed and when market conditions are changing, or new technology requires change and when seeking efficiencies. The Confucian values of peace and harmony; having moral courage; integrity and being aware/careful of shamefulness or whakamā (Low and Ang, 2013b). Key to growing trust (xin) is that

⁵⁵ The Organisation for Economic Co-operation and Development, an intergovernmental economic organisation with 35-member countries and founded in 1960. Retrieved from <https://www.un.org/en/sections/member-states/intergovernmental-organizations/index.html>

the gentleman(sic) must gain trust before giving orders. Like Māori there is an order of things in kawa,

[f]or rituals are needed to be in place to ensure good ways of doing things.
. . . rituals provide the cultural context and the reasons for the way we do things.

That begs the question: why Māori or indeed Confucian management techniques differ from Western models? Theoretically, the Confucian management system is also the same approach taken by the Māori corporates – continuous improvement while their Western counterparts appear to favour quantum jumps. On the surface that maybe the appearance however, my experience with US multinationals whose purpose was supplying Information Technology to the Asian giant was to provide the tools necessary to make smart, informed and timely decisions. Another trend by the Confucianist grounded client was the swing towards the US practises of hiring contractors like ourselves to make the ‘quantum jumps’ to be competitive and become the world’s leading economy. That proves the adaptability of bedrock philosophies, how it lends itself to the dynamics of responding to the many opportunities in business.

Practising guanxi / whakawhanaungatanga to support this research

In Aotearoa New Zealand the Chinese Māori relationship according to Ip (2009) have matured with third-generation families also making their mark in the Māori worldview. The current (Who is Meng Foon, n.d.) Race Relations Commissioner is the New Zealand born of Chinese extract named Meng Foon. Fluent in te reo and the composer of Māori music is also able to address Aotearoa New Zealand citizens in the English, Māori and Cantonese languages.

Research visited Beijing, Singapore and Malaysia to see the influence on the daily and business lives from practising Confucian virtues. This also confirmed a deep interest in their history and of course the continuing scholarship in the Chinese language.

Research also subscribes to the promotion of Sino-New Zealand trade knowledge base through active membership with the New Zealand China Trade Association© and The Asia Foundation©.

Observing Confucian rituals in my community

Building on guanxi extended to the local Chinese small business owners and the students who are studying Business and English at the local college. One graduate from the PRC became a trustee to The Sinic-Iwi Research Foundation. In personal communications they viewed Confucian virtues as being ‘normal’, as being Chinese citing Xiào (filial piety), the value of whānau extending to their ancestors with the *Qingming* festival also known as Tomb-Sweeping Day. That event occurring on the first day of the fifth solar term of the traditional Chinese lunisolar calendar. While they shared Confucius teachings there was the reluctance to commit to a formal interview that needed names to be attached to their comments therefore their input could not for ethical reasons be referenced in my research.

Confucius virtue in leadership

In citing the Analects XIII: 6, the sage Confucius is stressing the importance of leadership integrity, of being an upright leader asking the question, why should a leader have any difficulty in managing and administrating his country if he is upright? The point was reinforced with the view that the leader be ethical in having virtuous character and attitude as harmonious interpersonal relations that is reciprocally obligatory on the grounds of hierarchical relations. Another virtue was *xiào* (filial piety), respect for one’s parents, elders and ancestors and the

hierarchical relationships that would also be interpreted as in tikanga Maori. For example, a hapū chief appointing his eldest son or brother to succeed him. Both cultures had what is known as vertical collectivism, a hierarchical form of succession; bypassing meritocracy, the best person for the job. Today, some Māori corporates exercise their choice of appointing outsiders to key position, sometimes as a stop-gap measure.

The Confucian virtue *Ren* pronounced '*jen*' is one of the most complex concepts of Confucianism, that could never be explained in any other language other than Chinese. As that which Peter Bol (2012) of Harvard University described as a "ritual with attitude." It is said to be methods of humaneness, benevolence, and an attitude *with* ritual akin to aroha and manaakitanga, to be exercised by the governance of the Māori corporate to its shareholders being whānau, marae and hapu.

Findings

While fact finding from reputable sources (contextual) and published research with its accompanying conclusions may contain opinions stated as being subjective, as a researcher my aim must be to provide an objective view to meet the demands of the research question. As the researcher I must assume that the evidence in support of an argument and its conclusion is factually based and discoverable by reference using bibliography.

Moreover, I must declare that my findings are based on the needs of mātauranga-a-hapū, a bias, as opposed to the generic mātauranga Māori. For while the core values that underpin the totality of tikanga Māori will be applicable to my client (any hapū), there may also be variances based on local practises Mead (2003: p. 13).

Defining tino rangatiratanga or self-determination for hapū business entities

This principle according to Pihama (2005: p. 361) is an expression of Māori aspirations for self-determination, Māori autonomy, and Māori sovereignty. Ko te tuarua (the article 2 of the Māori version of the Treaty of Waitangi 1840) permits Māori to, “an unqualified exercise of the chieftainship over their lands, villages and their treasures.”

For almost two decades now hapū and iwi had exercised that right, a prerogative or exclusive right or privilege on who and how they wish to trade with whether in Aotearoa New Zealand or in the overseas markets. As of 30 December 2018, Māori, as a treaty partner within Aotearoa New Zealand are eligible to participate in The Comprehensive and Progressive Agreement for the Trans-Pacific Partnership (CPTPP) to seek business opportunities. As such, they are also eligible to utilise the dispute resolutions mechanisms established in the Protocols and Rules in that Partnership. Article 2 does authorise Māori to negotiate their own trade pacts however, they would be best advised to ‘piggy-back’ on their treaty-partnership for the dispute resolution mechanisms. A caveat: while still having relative freedom to negotiate agreements, Māori are bound by any sanctions imposed by the world bodies such as the United Nations on one of its member nations.

Can Māori businesses export separately outside the umbrella of Aotearoa New Zealand?

Contextual evidence from the Māori corporations such as Miraka, Ngāi Tahu Holdings and the Wakatū Incorporation (Wakatu Corporation Our past, Our Future, n.d.) attests to their successes in independent export outreach highlighting dividends/benefits to their whānau as owners and shareholders.

What role could the Kāhui kaumātua have?

No research was found that defined their role or roles. There was however, during the data collection phase a hui with a major iwi group that represented its role was to primarily be representative of the whānau, marae and hapū, to the iwi Trust board. The iwi were not exporters or involved in major business so there was no discussion initiated to determine what if any, was their role in the business decision-making other than being representatives.

Tikanga Māori and Confucian virtue both subscribe to vertical collectivism, a ‘top down’ concept of leadership. At hui leaders listen, summarising petitions then after gathering consensus, to form the final decision. Within hapū, Mead (2003: P. 14) lays down a framework this way:

[k]kaumātua and kuia, the elders, are often the guardians of tikanga; expected to know; should not be new to them, . . . experience is definitely helpful in knowing what to do.

The principle of manaakitanga (dividends) to the marae (shareholders)

Manaakitanga (Mead, 2003: p. 29) may also manifests itself today in monetary form based on two provisions: Te Ture Whenua Māori Act 1993, and specifically articulated in the individual Trust Deeds for dispersal to hapū, whānau, marae and iwi. One major iwi has to date dispersed more than \$11 million dollars (Ngāi Tahu Fund, n.d.).

Whakawhanautanga and industrial relations in the workplace

He aha te mea nui o Te Ao?

He tangata! He tangata! He tangata!

The term whakamana tangata in this whakatauki empowers people. There are five core values of associated with the Māori worldview as enumerated by Kuntz et al (2014): kaitiakitanga, manaakitanga, whakawhanaungatanga, auahatanga and wairuatanga. Above all, the wairuatanga is seen as being the overarching quality for it speaks to a capacity; to have faith that links Māori to each other and the general environment.

While the tikanga based approach of aroha and manaakitanga is expected in a hapū based business, Low (2006) explains how the teachings in the Analects are applied in the Confucian managed situation as thus:

[b]usiness collaborates with members in a purposeful team fashion, “rubbing shoulders” and doing something together also gives the opportunity to share. There is a joint purpose, sharing the same dreams and bring the relationship to a higher plane. There is also synergy.

The author further expresses what could be added to a proposed hapū joint framework that what Confucius taught was, “in essence, it seems that this teamwork, or more appropriately, consensus-seeking culture may be related to loyalty, which is also considered to be a virtue.”

This research proposes the conceptual framework for intra-hapū and for its cross-cultural partnerships based on the cross-bedrock philosophies.

Conclusion

Following the Data Systems Analysis, the logical and physical objects of the proposed hybridised partners were documented. Albeit, from two diverse and different cultures there was commonality between the two philosophies even down to a perceived weakness that would have undermined each one. Today’s practitioners have re-interpreted the texts from the millennia using contextual theory. One scholar suggested an ‘organic’ interpretative approach, the other proposed to ‘create one for today’. When viewed microscopically, both solutions are

identical. As the AI designer, my task in the next chapter is to articulate solutions deploying 'Rules and Inferences' for 99% of the proposed workload. The remaining 1% solution will be derived from utilising Calculus-3, Linear Algebra and Property with other mathematical components with the C# or C++ computer languages.

CHAPTER FIVE – Case study two – AI Architecture

Confucius (Zhou, 2005: p. 184), the great independent Chinese philosopher taught that, “Good preparation secures success; poor preparation leads to failure.”

Introduction

Case Study research question:

How to manage and deliver sustainable equitable decisions?

The thesis deliverables

At the completion of each IT or IS research project I formally described the findings and made recommendations to the project sponsor. These were the tangible and intangible goods and services (benefits) to the client. The foundational deliverable in this instance is an AI tool to enable the Māori exporter to deliver sustainable decision making based on two or more unique underlying philosophies.

AI is a machine that simulates a ‘thinking’ process, and acts based on programmable instructions. Its data information needs to be defined, tailored and introduced by electronic means. None exists for mātauranga-a-hapū. Using a technique similar to the Braille⁵⁶ system this researcher has codified (Mead, 2003) tikanga-a-hapū in a form as machine acceptable using the HMMead_Algorithm© (described in Figure 3).

Arguing the case for automation

The debate: *People v AI in the cross-bedrock philosophical environment*

⁵⁶ Braille is a tactile writing system of touch reading and writing for blind persons in which raised dots represent the letters of the alphabet, punctuation, numerical and well as grouping to form words. The process is expanded in Chapter 6 – Case Study of AI.

The objective: *Delivering 100% equitable decisions*

Using Langer (1997) a proposed hapū corporate organisational chart was created detailing the elements of mātauranga Māori, hapū centric legislation (PSGE), Aotearoa and New Zealand parliamentary legislation. Every element represented in the following chart implies tikanga Māori validation with the assumption that the individual is fully knowledgeable in mātauranga Māori including tikanga, applicable laws and local practices to deliver the thesis objective. This the Māori half of the Sino-Māori relationship.

A Proposed Hapū Corporate Organisational Chart

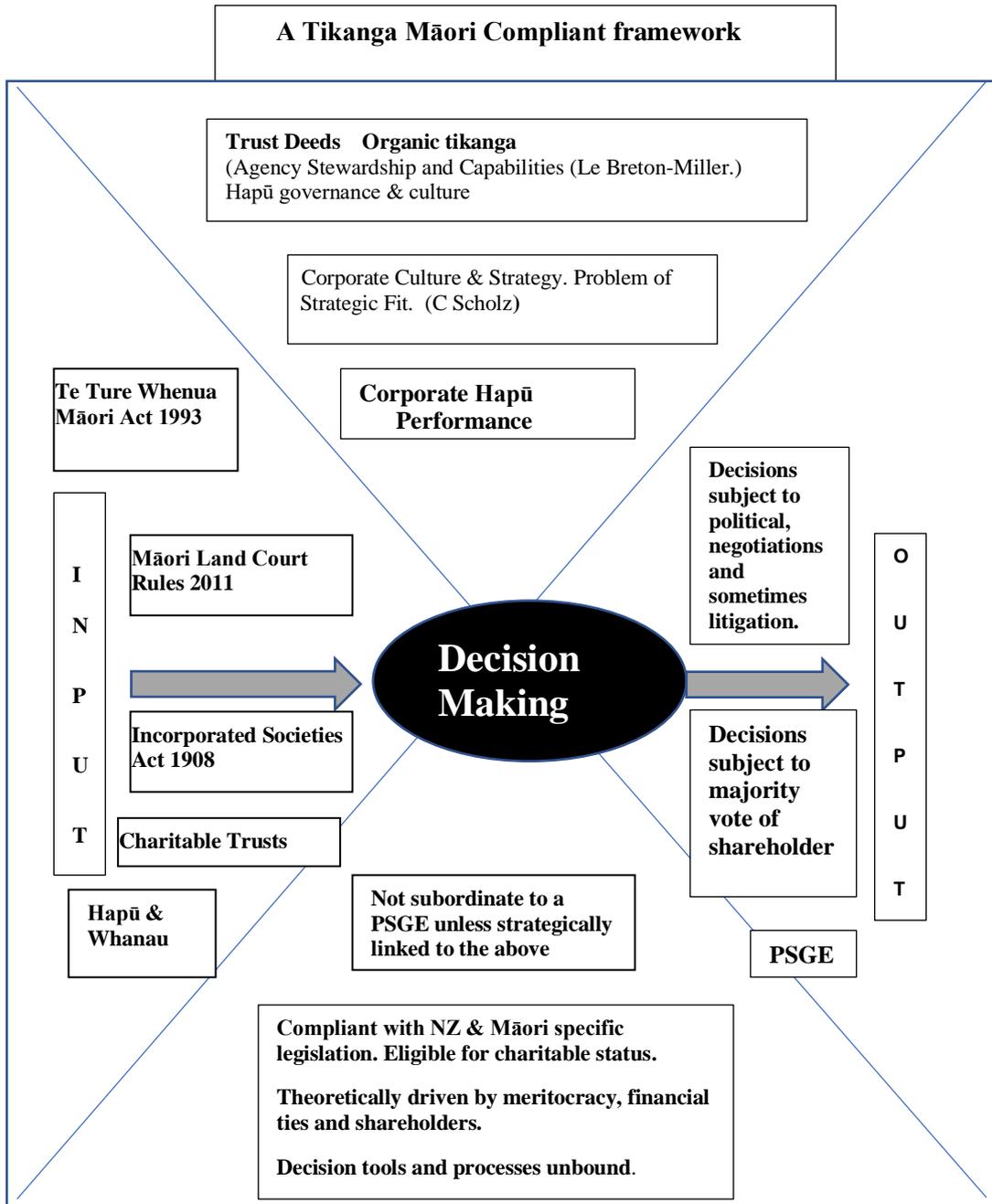


Figure 13. Post Treaty Exporter Knowledge Base

Decision Support to use AI that augments IT solutions

The opening statement was succinct and cogent. Both Mead (2003) and Low (2012) had articulated the underpinnings and established the guidelines. This research completed the technical/design specifications based on the open-source Expert System with AI from vendor Tensorflow© (TENSORFLOW, 2018).

Following the Wiig (1994) specifications, He Pātai© will have four main components:

- the knowledgebase
- an inference engine
- knowledge engineering tool (HMMead); and,
- a specific User interface (Dhaliwal & Benbasat, 1996).

Singularly and collectively, mātauranga and Confucianism are to form an *object* dataset, meaning a collection of information expressed in ‘0’ and ‘1’ digital format and recognised as knowledge assets (Laudon & Laudon, 2002).

The object-oriented methodology converts that *object* to an electronic form of knowledge representation (Vranes & Stanojevic, 1995).

AI is described by (Ruiz-Sanchez, Valencia-Garcia, Fernandez-Breis, Martinez-Bejar & Compton, 2003) as a system of vocabulary that (Chandrasekaran, Josephson & Benjamins, 1999) “carves the world at its joints.” He Pātai© is designed to bridge those disparate parts by a holistic routine that will expedite the decision-making processes exponentially.

Event Anomaly Detection

Tikanga values such as manaakitanga and whanaungatanga (Mead, 2003, p. 29) are integral to the future growth of hapū while wealth is created, then re invested. That long-term strategy of intergenerational wealth is so very important to all. System integrity, security, and legal compliance are also the responsibility of He Pātai©. Deployed AI will identify any abnormal behaviour within its pool of collected data information including financial records.

Artificial Intelligence demands multiple ontologies

To the philosopher, ontology is based on lived realities and associated with fact and theory (Bawden,1991; Creswell, 2003). In the Māori context Professor Wiremu Doherty, CEO of Te Whare Wānanga o Awanuiārangi in Doherty (2012) describes ontology as a way of knowing the world and the way it executes tikanga (Mead, 2003). Foundation as an AI agent has to also consider the view of Gruber (1993) in designing He Patai© for AI has to consider the ontology *for and of* the Information Sciences as illustrated as thus:

[t]hat is, “explicit specifications of *conceptualization*”, where *Conceptualization* is a set of objects which an observer thinks exist in the world of interest and relations between them . . . that an ontology is used to share vocabulary (ontological commitment). Compositionally as ‘systematic, operational and prescriptive of fundamental concepts and relationships which show how (Foundation) views the target (China and Māori trade) as building blocks for (He Pātai©) models.

Thinking ontology in terms of He Pātai© (Information Systems)

Simply put, I refer you to the graphic illustration of HMMead_Algorithm© at Figure 3. It is a graphical representation of each component collectively describing how He Pātai© must perform its tikanga purpose based on Mead (2003). The form it takes is to allow you to be

seeing it through the human eye viewpoint. Unfortunately, in that form it is useless to AI and IS. The need is to explicitly describe it in a form understood by computer chips and ontology presents that descriptive form. Take for example the listed ‘Five Tests’ component in Figure 3. Each form arbitrary decisions e.g. whether a decision by AI on a business decision will be ‘positive’ or ‘negative’. Within a specified ontology for that single or multiple decision-making process(es) will be certain checks by an indicator for example, the status of the governance or executive person executing that decision. Another ontology could be expanded to create other sub-ontologies supporting checks and balances. The ANN in He Pātai© will process these indicators while in conversational mode with the CEO or Operations Research group.

Within AI, are many critical decisions being made based on time and date to handle ‘housekeeping’ such as for example, hapū email or generating panui. Hapū knowledge engineers would create simulated scenarios built-in other ontologies to test the systems integrity as an ongoing process. Its availability is 24/7.

Cross-cultural relationships (tikanga and Confucianism) produce complex processing that is time and resource intensive for humans. AI and by extension, the ontologies for and of the Information Sciences will meet that tikanga based correct decisions.

At the human level, the comparison of guanxi and whakawhanautanga could be interpreted as meaning close to being equivalent when viewed through the English language lenses. However, when using the ‘slice and dice’⁵⁷ methodology using both te reo and Mandarin Chinese there are subtle differences that underlying philosophy ontologies would be developed to highlight the differences to produce decisions of integrity⁵⁸.

⁵⁷ A common method of dividing a quantity of information up into smaller parts, especially in order to analyse it more closely or in different ways.

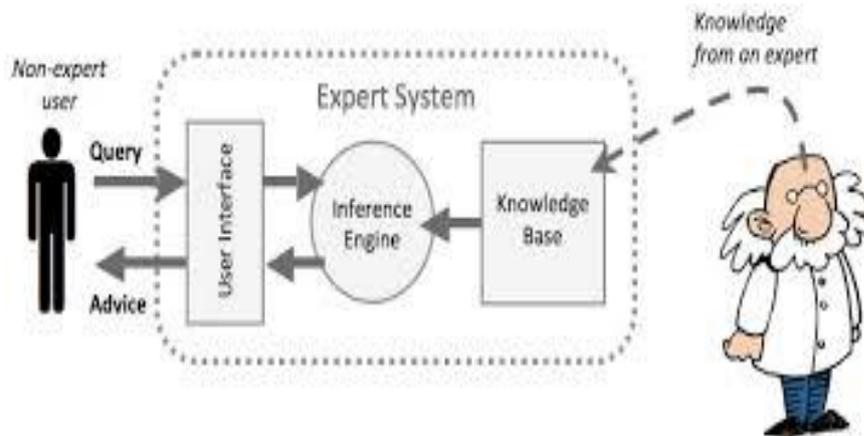
⁵⁸ The quality of being honest and having strong tikanga principles.

Another example is using the same technique to codify the virtue of *Li*³, while in its simplest form means ceremony, ritual, good form and custom and is close to marae kawa,

The use of multiple ontologies to describe content theory by McCarthy and Hayes (1969) has assisted this research and design to differentiate those nuances required by He Pātai©, in the hapū rituals for events such as cross-cultural corporate hui whether on the hapū or manuhiri marae or meeting the importer of hapū goods and services at their tūrangawaewae or corporate offices overseas.

The He Pātai© AI architecture

The theory and importance of the ES and AI was built round replacing a top expert, a troubleshooter with expertise in diesel engineering at General Electric©, a \$147 billion-dollar corporation (Bonnison and Johnson, 1984). In building the business case for AI within the hapū corporate this research revealed its need to capture and store mātauranga-a-hapū and tikanga experts' knowledge for posterity. Besides, the export corporate executive needed business intelligence tools and a sophisticated decision-making infrastructure for the present and future. The structural design was inspired by human information processing theory by Waugh and Norman (1965).



Credit to IGCSE ICT. Retrieved from https://www.igcseict.info/theory/7_2/expert/

Figure 14. An Inference based Expert System

In the above illustration the human figure depicted on left depicts a He Pātai© governance and executive user whereas the character on the right would be the hapū knowledge engineer who receives instructions from kāhui and Foundation and is responsible for initializing and updating that knowledge base.

The He Pātai© knowledge data-base holds three main categories of knowledge: mātauranga-a-hapū, Confucianism and Aotearoa New Zealand Legislation in explicit, (Bradley, Paul, & Seeman, 2006), tacit and embedded forms (McGraw & Harbison-Briggs, 1989).

After the collection and verification of hapū data there is the need to codify and structure the problem-solving environment, including the interpretation and integration of responses to the question asked through drawing analogies, posing counter examples, and bringing conceptual difficulties to light (Aronson & Turban 2001). The Inference Engine (Vallverdú, 2014) in the illustration contains computer code will manipulate and process the inquiry to produce a response to the governance user.

Codification of the bedrock philosophies

The first step on the road to wisdom is the admission of ignorance. The second step is realizing that you don't have to blab it to the world. By Joseph C. Giarrantano, Ph.D.

Both bedrock philosophies as alluded earlier require 'codification' to be processed by AI to become the knowledgebase containing all the rules or rule base. This will be derived from English/Chinese/Pinyin characters to a form 'readable' to He Pātai®. This research utilises the tools provided (Giarrantano, n.d.) as a step-by-step process for the purpose.

Expert System limitations

The efficacy of ES and AI in He Pātai© is predicated on the notion that the process of solving unstructured decisions consists (Brim, David, Glass, Lavin & Goodman, 1962) of five sequential steps: 1) Problem identification; 2) Assimilating necessary information; 3) developing possible solutions; 4) Solution evaluation; and 5) Solution selection.

While the integrity of the data, the proficiency of the coding person to the query being entered into He Pātai©, what is critical to its efficacy is the selection of a solution from a list of multiple solutions rests upon what Dewey (1910) writes

[i]s a belief resting on some basis, that is, real or supposed knowledge going beyond what is directly present. An acceptance or rejection of something as reasonably probably or improbable.

So, even in the best Rule-Based AI that produces multiple valid responses to a given problem, the final selection is dependent on three critical aspects: experience and knowledge and wisdom of the User making the query.

Traditionally rule-based ES or AI operate best in structured decisions environments (such as what HMMead offers) which has a definable right answer that users can confirm the correctness of the decision by evaluating the justification provided by the explanation facility (Gefen, Karahanna & Straub, 2003).

Other limitations identified (Luger, 2005) include:

- Difficulty in capturing deep knowledge of the problem domain
- Lack of robustness in flexibility
- Inability to provide in-depth explanations of solution logic
- Difficulties in solution verification; and,
- Little learning from experience.

While there are limitations expressed by Matsatsinis and Siskos (2003, p. 86), this researcher / practitioner asserts that through competent technical design and thorough training of hapū knowledge engineers, He Pātai© will meet its stated goals of generating tikanga based solutions in the form of recommendations culminating in the equitable decisions.

Pre-implementation and the testing regime for AI

Again, the stated goal for He Pātai® the Expert System, is to generate sustainable, equitable decisions 100% of the time. The description of the output is information for the executive or, data for the hapū business intelligence or operations researcher. As the developer of the tool the test standards are based on The Hitchhiker's Guide to Python (n.d.), that sets general rules of testing of AI functionality to be used in conjunction with the CLIPS operating manual

(SOURCEFORGE, 2018). Both bedrock philosophies will be validated singly using their AI codified content then in combination to ensure the commonalities. Test scripts for the validation of tikanga Māori business principles will utilise the standards set by Rice (2019) that stresses the need for robust test documentation. The need being validation through “regression, continuous integration, as a basis for knowledge transfer, reducing defect levels, where defects seem to be concentrated.” The standards that kāhui will establish would be documented scenarios that tests the integrity of the coder/programmer. Let us break those down:

- a) Regression – past results will be compared with the current to see what and why the change took place. One tikanga reason could be that a rahui was in place before, that prevented a transaction from taking place in this instance.
- b) Knowledge transfer – in the case of the partner - owned AI making or tweaking a value within its business principles. e.g. due to a pandemic, raw materials could be in short supply that could also affect an agreed/contract price. Where the business principle had been validated before, a footnote would be expected. These are the actions could be intuitive (based on feelings) or the AI will create an alert.
- c) Continuous integration of data would be flagged purely for information sake.
- d) Errors/defects concentrated may reveal shortcomings in the codification of the underlying philosophies. The error could be localized within the hapū or in a partnership arrangement. The test scripts should highlight the discrepancy. Note: Research will include ‘cluster’ techniques to detect this type of error.
- e) Research will create destructive/stress test scripts that will simulate internal and external known ‘hacking’ techniques for two reasons: the robustness / perceived weaknesses of the two bedrock philosophies or, attempt to overwrite or destroy data base information. To test the ANN functions that are predicated on previous

interactive dialogue, test scripts will simulate conversations based on a governance entity.

It is expected that at the outset the contents of test scripts will remain static and AI through ANN will suggest change to keep its logic current.

Post-implementation and recurring stress-testing for AI

- Sample scenarios by the governance entity based on “What if?” using AI GUI.
 - i) The implications for hapū on central government export policy change? Tariff increases/decreases based on past fiscal year performance by market.
 - ii) Effects based on response from previous questions for corporate performance.
 - iii) Display Tikanga based Business Principles Table with footnotes.
 - iv) Calculate expected gains/losses for currency exchange based on ‘futures’ table for market ‘a’.
 - v) Calculate foreign currency gain/loss from ‘past’ table rate.
 - vi) Tikanga implications for new market country ‘a’?
 - vii) What adjustment to MCS⁵⁹ for new market ‘a’?
 - viii) Any tax treaty benefits of country ‘a’?
 - ix) Costs associated with trading with country ‘a’?
 - x) Snapshot of benefits for a Tiriti⁶⁰ with country ‘a’.
- Sample scenarios by **Operations Research** based on “What if?” using special AI GUI.

⁵⁹ Modernity, Capitalism and Scientific Rationalism concepts guiding corporate business objectives.

⁶⁰ Based on Ko te tuatoru Te Tiriti o Waitangi

- i) Using (iv) above, a 6-month projection using interest rate 2.6% from futures. Display with table 'A'⁶¹ format.
- ii) Format (v) above report for YTD and calculate best ROI rates AUD/USD/JPY where commodities, currencies and securities are traded.
- iii) Calculate loss/gains over 12 months for markets 'a' and 'b'.
- iv) Project fisheries export yield sales by species for market 'a'.
- v) Financial projections for market 'a' FY2020.
- vi) Calculate shareholder dividend for FY2020.
- vii) Calculate payroll based on 1.6% Cost of Living Index for FY2021.

AI and Kaitiakitanga for Māori and non-Māori

Advances in AI enables finance, healthcare, education amongst other applications of this extraordinary tool within hapū. Yet at the same time tikanga must be maintained to ensure the values within the algorithms respect the tenets of tikanga. While transparency is expected in governance there must be accountability and any biases in the way decisions are made so AI itself must be regularly audited whether by external or internal sources.

Hapū must also be aware of breaches outside of tikanga such as internal adjustments of financial records by unauthorised persons. This could affect relationships with trade partners and financial establishments. It is suggested that within the ROI calculus of accountability an external entity be permitted to view the million lines of code in each application for further examination. Penalties should also be determined by the external source – the nation's legal system.

⁶¹ Format described in Technical Specifications.

Grass roots data contribution to AI is of equal importance

The hapū corporate is not a static entity; it needs to learn, and change structures to adapt to opportunities while continuously looking for ways to advance its mission of manākitanga to its hapū and whānau. No better place than that of the wānanga (Mead, 2003: p.4) where,

[c]haracterised by teaching and research that maintains, advances and disseminates knowledge and develops intellectual independence and assists the application of knowledge regarding ahuatanga Māori (Māori tradition) according to tikanga Māori (customs).

For hapū members and progeny are shareholders in perpetuity of the corporation. Through wānanga (shareholders meeting), their korero may for example, initiate (data) adjustments to the principle of manaakitanga (corporate dividends). He Patai© is notified; it's internal calculus adjusted to generate the sustainable tikanga based decisions.

Hapū data under te tiriti o Waitangi is an equal partner in Aotearoa New Zealand

To export, hapū needs the legal frameworks and agreements to follow international conventions by negotiating and setting up mutually agreed rules with contractual obligations satisfactory to its shareholders. Add to that is the bedrock of tikanga and Confucianism. Those components are formed through data gotten from diverse sources. i.e. NZ Ministry of Business, Innovation and Employment (MBIE) who is charged in shaping and delivery of a strong New Zealand Economy.

Tikanga-a-hapū inside New Zealand Law/ legislation is uncodified

Current legislation (Mead, 2003: p.5) articulates: Resource Management Act 1991 in part 1, section 2 describes tikanga Māori as Māori customary values and practises; Te Ture Whenua

Māori Land Act 1993 defines several Māori terms including kai tiaki (Guardian), customary values and practises, tipuna. Section 62 deals with appointing additional members with knowledge and experience in tikanga Maori to that Court. In Section 61, tikanga Māori is an issue between the High Court and the Māori Appellate Court in which on the issue of tikanga Māori ‘shall be binding on the High Court.’

Moreover, the New Zealand Law Society, the governing body that regulates practising lawyers recognizes a Kaumātua⁶² (an elder Māori person in good standing) to support the nomination an LLB graduate whose practical competencies have met their standard to be admitted to the bar and to hold their practising certificate in this country.

AI accepts tikanga data in unwritten form; promises tikanga compliant decisions

Michael Polanyi (1966, p.4) declared “I shall reconsider human knowledge by starting from the fact that *we can know more than we can tell.*” (Researcher’s note: The italics are in the original.)

Earlier the philosopher (Polanyi, 1958, p. xi) described the terms “tacit knowing” or “tacit knowledge” as “that not only that there is knowledge that cannot be articulated by verbal means, but also that all knowledge is rooted in tacit knowledge in the keen sense of that term.”

Deriving data from tacit knowledge as a tool

For several times a year a tri lingual team (The Ngāi Tahu Website, n.d.) tourism team travels to the PRC to enjoy kai and their brand of hospitality with clients and potential customers. They ‘sell’ their history and whakapapa connections in the client language and dialects. That

⁶² Retrieved from <https://www.lawsociety.org.nz/search?query=kaumātua>

approach also has a Li³ (ritual in Confucian virtue) tacit dimension that engenders the promise of being long-term rather than a short-term relationship. That same manaaki approach is recommended for the other Sinic (Confucian based) group such as the PRC, Japan, Korea, Vietnam and Singapore.

Traditional paradigm versus an object-oriented solution for exceptions

Hapū contracted SIRF© to create the AI using traditional knowledge base decision-making processes articulated by Mead (2003; p 217).

Epistemology and AI

Epistemology is the branch of philosophy concerned with the theories of knowledge. This part of the thesis requires the computer sciences (IT & IS), mathematics, data analysis, statistics, software engineering and programming. Cultural heritage brings te reo Maori, mātauranga-a-hapū and an insight into governance principles underpinned by tikanga. Professional experience in Taiwan was Confucian ethics brought practical application of a philosophy that has been in existence since 500 BC and more importantly, daily application of the Chinese culture and language.

Research methodologies

Applied Research, Structured Systems Analysis and Design, Mixed Methods, mātauranga-a-hapū, and kaupapa Māori research methodologies, and Confucian Virtues were utilised in creating, designing, coding, testing and the implementation of this tool and any interfaces necessary to communicate with other AI or MIS.

The taonga aspect, unique business principles, operational specifications for hapū AI

The cross-cultural, tri-lingual and tikanga validated business data sets required a two-stage development and implementation. Firstly, mātauranga Māori is uncodified and only the commonalities of both have been deemed as being essential to deliver the decisions. To ensure rapid delivery of information a database of tables containing both will be specified as having rows of data with a specific data type for each field or column.

The Database constructor will create (if necessary) and return a Structured Query Language (SQL) that will create a file with a given name in a folder. The Date function will return a new Date with the information detail. An object-oriented programming language model organised around **objects** rather than ‘actions’ and data rather than logic. Single or twin epistemologies with several ontologies and sub-ontologies, one each for mātauranga-a-hapū and Confucianism, would complement the ontologies *for* and *of* IS. In IS terms, an object may send an area message to another object where the appropriate formula is invoked. The receiving object maybe a rectangle, circle or triangle.

Data collection methods

Data collection for this thesis included visiting the PRC, Singapore and Malaysia to interview Chinese-business owners to add to the above knowledge. Their interweaving of ancient knowledge in an office culture of two distinct cultures was the catalyst that successfully implemented critical IT infrastructure. That experience bodes well for developing this Sino-Māori trading relationship.

Cross cultural objects and artefacts, supporting documents, multi-lingual literature, business statistics, economic projections through systematic listings were categorised then sampled as various business cases in a formal ‘walk thru’ (a manual process used in conjunction with kāhui and the Knowledge Engineers to move step-by-step through the thought processes) to

determine different ‘scenarios’ acceptable to tikanga. A sign-off is required from the management team and the concurrence of kāhui kaumātua.

The need to describe real life business situations for AI to ponder

This is the ‘nuts and bolts’ of any AI system: He Pātai© is no different. Business scenarios⁶³ will be created⁶⁴ by the hapū trained knowledge engineers and implemented in the operational version of the AI; they drive the AI **Inference Engine**.

Here are some examples of how scenarios codified in test scripts (Rice, 2019) will test the intuitive components of AI. Each scenario is preceded by the “what if?” question.

- **Preventable-1:** In highlighting potential pan-iwi conflicts such as a perceived natural resource ownership i.e. fresh water-right⁶⁵. The He Pātai© Inference Engine will be programmed to recommend an action(s) or a ‘work-around’. The interpretation of the actions may be lost on the executive who is a non te reo Māori speaker hence unaware of that tikanga aspect of kaitiakitanga. The political ramifications may also be lost on him/her.
- **Preventable-2:** While AI recognizes similarities and the subtle differences of whakawhanaungatanga versus the Confucian virtue 孝, xiào, filial piety, and dependent

⁶³ To restate: AI is an inanimate object that cannot think. It will only act on instructions and information defined and embedded by engineers. Its power is in how fast it is able to create solutions to a given problem whether simple or highly complex. Take a simple scenario: on a “What If?”, whether a certain action would be a breach of tikanga? (Take a look at Figure 12. for a sample dashboard) A multi scenario could be whether a certain action would breach tikanga and Confucian virtue. AI may respond to say that there is a breach of one of the two? Again, AI would ask whether an override (‘organic’ in the case of a tikanga breach). AI will validate the signature (Log on ID) or allow the transaction to continue by creating an audit trail. AI will also verify all financial transactions activity based on established conditions. What if? scenarios will be created and tested by hapū engineers and validated by the kahui. The number of scenarios is unlimited. The objective being that He Pātai© generates sustainable tikanga decisions.

⁶⁴ From personal experience multi-million scenarios were created for the airline travel industry to ensure the lowest possible fare that meets industry rules across the hundreds of airlines across several continents taking into account national boundaries rules and such things as airport taxes. If an airline system failed to collect a tax it could be penalised financially. There was no room for error.

⁶⁵ While water that Māori view as having mauri deserves guardianship/kaitiakitanga rights, a non- Māori executive may view any anomaly with water as a mistake. Whereas He Patai© knows it could be a tikanga breach.

on the type of transaction, it might hesitate. One reason being the Māori business principle of ‘inter-generational wealth’ may mean something different in a cross-cultural business transaction.

- **Preventable-3.** Simulate a new sales/market approach with new sets of incentives using business principles of ROI/Debt Equity Swap.
- **Strategic -1.** Using hapū whakapapa records, the Operations Researcher on behalf of human resources, compile lists of prospective candidates for succession or other legitimate purposes.
- **Strategic -2.** Using the ANN and ML functions an Operations Researcher could invoke the HMMead_Algorithm© to import data from partner AI or web page to forecast sales/marketing by subsidiary of fish or dairy products.
- **Strategic -3.** Clone (with permission) a partner’s underlying philosophy database to forecast sales/marketing for a new market within the same country.
- **Strategic – 4.** Simulate for research purposes other markets/societies who also hold to hybridisation theory. Or, another who subscribes to polarisation.
- **External -1.** Disruption to the distribution of goods or services by war, health reasons or financial/credit issues to determine resolution.
- **External -2.** For Operational Research, to create an expansion or contraction plan to move a subsidiary abroad. The response would be formatted as data than can be acted upon in another transaction.
- **External -3.** For the executive – a feasibility study for joint ownership with a foreign partner. The Operations Research group could ‘crunch the numbers’ of a possible relationship.

- **Systems Integrity -1.** This research will establish a cloned version of He Pātai® as the test base for validating new additions to the database. The mode of use is the test script (Rice, 2019) and the process is Regression Analysis. Procedurally, two output would be compared to find any perceived differences using Delta encoding.

A delta can be defined in 2 ways, *symmetric delta* and *directed delta*. A *symmetric delta* can be expressed as:

$$\Delta (V_1, V_2) = (V_1 \setminus V_2) \cup (V_2 \setminus V_1), \text{ where } V_1 \text{ and } V_2 \text{ represent two versions.}$$

Like the ‘algorithm’ expressed earlier in the thesis, the symmetric delta is not owned by anyone in particular. For the purpose of this project it will be written in ‘C’ language code to perform a simple form of delta encoding and decoding on a sequence of characters as thus:

```
void delta_encode(unsigned char *buffer, int length)
{
    unsigned char last = 0;
    for (int i = 0; i < length; i++)
    {
        unsigned char current = buffer[i];
        buffer[i] = current - last;
        last = current;
    }
}

void delta_decode(unsigned char *buffer, int length)
{
    unsigned char last = 0;
    for (int i = 0; i < length; i++)
    {
        unsigned char delta = buffer[i];
        buffer[i] = delta + last;
        last = buffer[i];
    }
}
```

Figure 15. Sample C code describing Delta encoding

These are some straightforward examples encountered on a regular basis for an AI response to the governance entity and/or the Operations Researchers. They will constitute the 99% activity identified above. The genius of AI is in that 1% activity (also listed above chapter) where He Pātai© will communicate interactively with the executive or Operations Researcher requesting critical data not present in the AI powered GUI.

The need to describe real life business situations for AI to ponder

The following is the He Pātai© User interface that allows the executive or Operations Research staff (based in log-in/password) to interact with its knowledge base. Usually there are graphical icons and audio indicators for the primary or login page. As this He Pātai© GUI is also multi-lingual, the decision was made to use text-based interfaces. The left column (blue) enables the user to enter directly the required portal. The secondary (bold black) elaborates on the former. Selecting from the secondary list places the terminal in either the English (default), Te Reo Māori, Or Mandarin Chinese mode that will respond in that language.

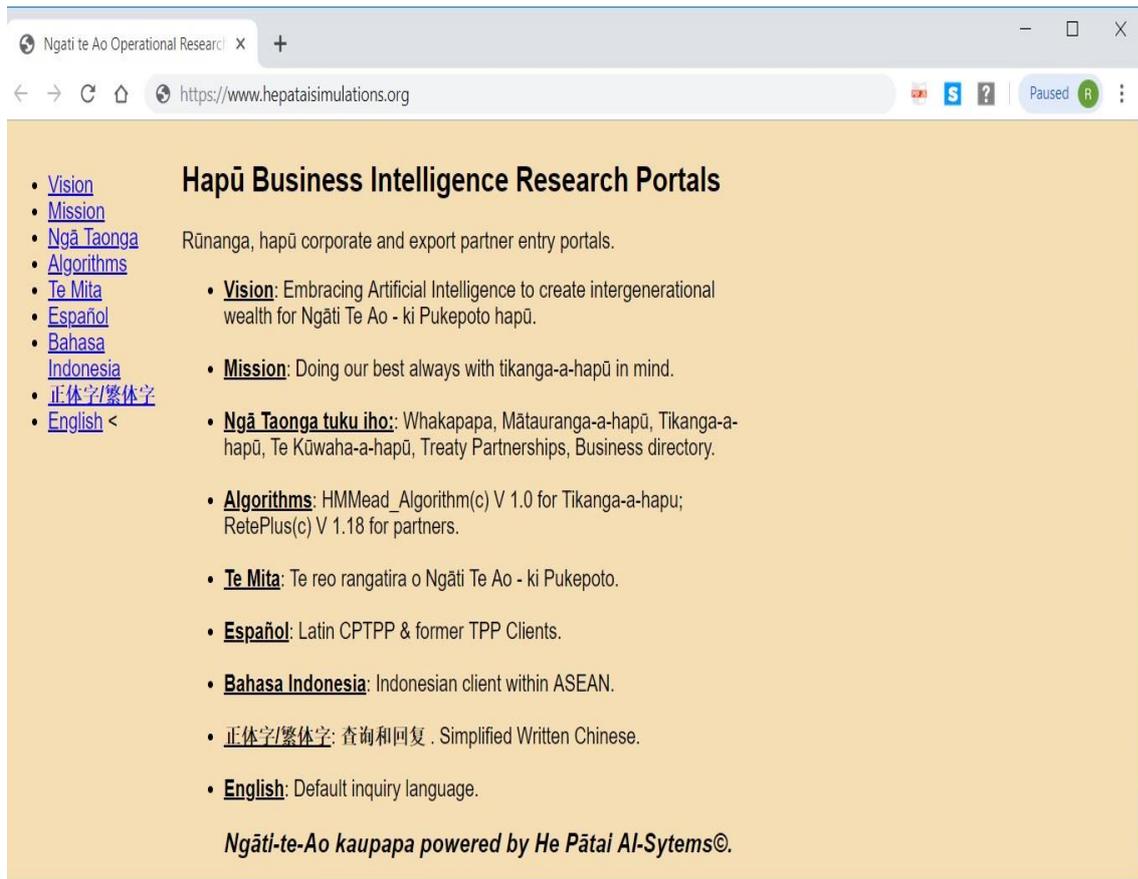


Figure 16. A screenshot from the CEO prototype AI System

Secondary GUI pages are proprietary and as such, are not displayed here.

A capital costing and budget analysis for a typical He Pātai© system was generated by this researcher in the role of Systems Engineer, using the Microsoft product Excel© suite, a spread-sheet specialist application.

My personal subjectivity within the case study

This is the culmination of different careers to produce a theoretical framework⁶⁶ and conceptual frameworks to advance the aspirations of the hapū. As an art, it is subjective; as a science, it is objective.

The interviews and findings supporting this Case study

While the concept of AI was discussed at a very elementary level, the application for a senior executive as simply a business intelligence tool drew considerable interest; mainly how would it make sustainable, equitable decisions easier. The response to that implied request was that AI be intuitive and will provide many options for the decision-maker. The possibility of a query driven tool that was also interactive replacing ‘look up’ operations for both the executive and a dedicated Operations Research Unit (ORU)⁶⁷ or team of in-house consultants was also received with great interest. Moving away from a convoluted manual process that is dependent on calling together several experts, deciding on a plan, writing computer programs, running the software overnight and carrying out analysis the following morning was the selling point. Especially, that if a programming execution failed for data or coding of programs errors, then there is a need to await a further 24 hours. Whereas AI, was instant.

⁶⁶ Theoretical framework in a study is based on an existing theory or theories whereas the Conceptual framework is something to develop oneself based on this theory. AI in this context is both.

⁶⁷ AI to replacing ORU for hapū corporate: 1) Cost prohibitive due need for mathematician or statistician (PhD) to generate business-modelling. 2) Business consultants (at least MBA) with an understanding of the hapū business model. 3) lack of tikanga-a-hapū knowledge & te reo speakers. 4) Lack of Confucian virtue and Chinese language specialists.5) Availability of the specialists 24/7.

Data collection

The AI and IS specifications with the documentation for the **Case-based-rules** and the **Inference engine** were obtained from Open-Source tools and the performances recorded creating the baseline system for He Pātai©. The product used by the National Aeronautical and Space Administration (NASA) called CLIPS© version 6.3, a Rules performance platform, was obtained free from the public domain software for building this project's AI. It was selected based on its performance and the ease in modifying its computer software code. Moreover, it was free, complete with documentation and test scripts requiring the minimum of effort to convert it in its entirety for our use. It was also an object-oriented language within the technical capabilities of Foundation. Tensorflow© another Open Source software library with the flexible architecture was chosen for its ease in the conversion to process 'organic' tikanga and its Neo-Confucianist equivalent notion of 'a Confucius for today.' The AI prototyping of both software to meet the hapū hybridisation model using syncretic data will be accomplished in a minor timeframe. The FuzzyCLIPS©, a descendant of CLIPS© shell that adds to the concept of relevance into the languages was also given consideration.

Design considerations as the AI researcher/Designer/Engineer - for He Pātai©

- Whilst the primary⁶⁸ search key is tikanga, He Pātai© needs to also generate a secondary key search where applicable. Mead's whakamātautau⁶⁹ is such an example.

⁶⁸ Information Science defines the artefact containing the tikanga in an ontology; associated keys in sub-ontology(s)

⁶⁹ Whakamātautau, means "to try on, to test more than once, to debate an issue and an idea." By H.M. Mead. Retrieved from <https://www.wananga.ac.nz/Lecture?id=3d304036-0691-e711-a7c6-b16b93>

- Ensuring the AI architectural design specifications return an evaluation and discovery of geographically semantic changes within a reasonable response time.
- The capacity to meet predictions of critical mass, prompt adjustments to disruptive innovation or catastrophic events such as the Global Financial Crisis of 2007-2008.
- Provide the capability to interface with another AI belonging to a trade partner.
- To generate te mita-a-hapū responses to a query.

‘Weak’ and ‘Strong’ AI

To understand the terminology associated (Hard v Soft AI Problems, n.d.) with AI, there first needs to be explained the two types of AI: ‘weak’ and ‘strong.’ He Pātai© is defined as “weak”, (but for our purposes of protecting tikanga, is ‘strong’) because it has a narrowly defined function that focuses on ensuring tikanga-based decision-making based in terms of the supporting information initiated by the “What_If” query.

Yet, the “strong” AI variety is said to have a consciousness, of being in the state of being aware and responsive to its surroundings as well as sentient, the ability to feel or perceive or indeed, experience pain. Hollywood has depicted this type of AI in recent times through science fiction movies such as the “Transformers©” franchise. The reality is that it does not exist, therefore remains undefined.

What AI is not?

As a tool, He Pātai© cannot think for itself. Its knowledge base will be created by the hapū Knowledge Engineers with the **Rules** and **Inference** engines programmed by a System

Engineer with te reo (me ōna tikanga) and the tertiary education to code how it should think. Scenarios will be created by the hapū members, its business partners and external sources for AI to interrogate and to supply a response to the inquirer who entered the What_If query. Some may ask, “are you not just asking for something that a human had entered into the memory? That is a fair question. The major difference and advantage is that AI will return a response based on interrogating millions of units of information that was supplied in the first place by the many experts, some of it known only to a few, and all in a millionth of second, twenty-fours a day for seven days a week.

That knowledge base could be derived from two or three different cultures, different languages and customs with the response in English or, in te mita-a-hapū. A caveat: the returned decision by AI is only as good as the knowledge given to it. Additionally, supporting information may also emanate from an external source such as a bank, trading partner or government agency. The control of the latter’s data is beyond the expertise of Knowledge Engineers but within the purview of the hapū Systems Engineer. So, whatever the status of the inquirer, whether a hapū member or, a partner trading nation on the other side of the globe, a sustainable tikanga-a-hapū response will always be generated by the AI – that is what is expected.

Engaging tikanga in the AI laboratory: Taonga tūturu

[f]ew would doubt that in their time our ancestors developed the arts to a very sophisticated and unique expression of the creative genius of the people. (Mead, 2003; p. 253)

While Mead specifies the term ‘arts’ in the above, this research argues that through the evolution and adoption of ‘organic processing’ in tikanga-a-hapū decisions today, that using AI, is a ‘science. Moreover, the science is being developed by hapū members for the executive

branch of its corporate body. Add to that, this research's hope that it also reflects the pioneering spirit of those of tupuna of 19th century Māori entrepreneurs.

Successful enterprises world-wide overwhelmingly embrace automation with AI as being critical and an integral component in supporting the shareholders' objectives of wealth creation through returning dividends to the shareholders. That capability and its potential use has not been lost based on discussions with a CFO during the data-collection phase with a multi-billion-dollar tikanga-a-hapū corporation.

The AI Expert and Machine Ethicist Mitchell Waldrop (1987) has this message for Foundation who is responsible for *codifying*, mātauranga-a-hapū including tikanga and Confucian *values*, kāhui kaumātua *assumptions* and the *purposes* for the marae and whānau this way:

[a]s computers and robots become more and more intelligent, it becomes imperative that we think carefully and explicitly about what those build-in values are.

Foundation's current version or iteration of the HMMead_Algorithm© holds the values explicitly defined for Māori in Mead (2003). Since that baseline, hapū unique mātauranga and kaupapa with business ethics and values have now been embedded into that algorithm. It is therefore incumbent on Foundation that those *values*, *assumptions* and *purposes* remain current through keeping abreast with the academy, hapū wānanga hui and with the AI communities world-wide.

There are two parts to this sub-chapter:

This first section prescribes for the kāhui kaumātua their new role as arbiters of taonga tuku iho by asking the 'why', 'where', 'who', and 'when' questions as keepers of old knowledge in its new role. That task involves organising, collecting, the preparation of and storage of the

taonga for transference to the AI, based not only on the ontologies of Maoritanga, but the ontologies for and of, the Information Sciences. As in non-Māori data handling where protocols are created for each step, the same must be developed in the form of tikanga through kawa and karakia.

The critical tikanga of tapu

The kāhui assumes that responsibility of being the ‘steering committee’, defending the ngākau (hapū heart) and wairua (spirit/ soul) of mātauranga that will become the centrepiece of new technology, and are sworn to protect its (Buck, 1949) mauri⁷⁰ for the success of the enterprise. To clarify the protection aspect, one must fully understand the role how karakia bestows mauri. He Pātai© AI data information includes hapū whakapapa, kaupapa, mātauranga with embedded mission critical business information. It may also house esoteric taonga as described earlier by Matua Hek. Whenever the Knowledge base is updated karakia rituals of kaitiakitanga (guardianship) will be performed by tohunga to restore mauri on the newly generated data information.

AI development through training hapū rangatahi and keen members

The second section involves the development support that also reports to kāhui. Initially, it will be a part of hapū, but it may split off to become a business entity, at arms-length for it has its own trust deed and therefore, legal obligations and reporting functions. Known as Foundation,

⁷⁰ A fuller description of Mauri is in the glossary. What is important here is the karakia (or the Confucian virtue of Li) to be administered by hapū rangatira such as the kahui. Te Rangi Hiroa (Peter Buck) in Buck (1949) describes the karakia or incantation as being a ‘formula of words which were chanted to obtain benefit or avert trouble. Buck emphasised that Karakia were not used to worship or venerate gods. This is an important distinction as the same word karakia is used outside of the secular world.

which is responsible for writing the job descriptions, posting the job vacancies, conducting the aptitude tests, then with kāhui, conducting the job interviews. The successful applicants will have numeracy and literacy skills updates from Foundation followed by training in kawa and tikanga. After that two-week basic training, the applicants will be introduced to ES and AI coding skills for the position of Knowledge Engineer. That course will entail the following: communications both written and orally, the introduction to Basic ‘C’ language (the operating language of CLIPS© 6.3), understanding the Main ()⁷¹ computer instruction with functions lines (8 – 23)⁷² and the various other components of the C Program. While it is not the intention to teach them to be Systems Engineers (the function reserved for this researcher) it nonetheless introduces the prospective Knowledge Engineer to the intricacies of the techniques that will be affected by their handling of taonga tūturu. This is followed by an introduction to advanced computer software logic that would simulate human decision-making. This requires an awareness of the high-level of cognitive responsibilities that each hapū member must have to participate in the kaupapa. What distinguishes this career training to the ‘outside’ world is the component that is inextricably linked to the culturally appropriate methods of safekeeping. Collection methods using practise data would be used to complete the taonga tūturu in visual form for presentation to kāhui and the hapū.

Following the theoretical and practical tests from the initial collection through to its migration to the test and production libraries, an examination will be conducted to determine the leadership of the repository functions to name the lead Knowledge Engineer.

Subject to the successful acquisition of a Microsoft© computer, a test platform will be created with Tensorflow© programs. A test platform of eSpeak©, a text to speech “formant synthesis” platform, namely the SAP15 version for Microsoft© will also be created for the mita-a-hapū

⁷¹ This the entry point of where computer instructions begin. This function also denotes where sub functions and other user defined functions begin.

⁷² These are sequential instructions with the computer program.

speech to text and vice-versa capability. All copyright platforms are opensource, meaning freely available. Concurrent with the Knowledge Engineer training and Systems Engineer platform development will be the course created for the governance and executive team. Computer protocols to link the AI to outside sources such as the government and commercial clients will also be tested and signed off by the partners. After He Pātai© testing is completed to the satisfaction of kāhui (the kaumātua or kuia) and the hapū corporate Chief Executive Officer, the production version of He Pātai© 1.0 will be implemented as a standalone system, meaning not dependent on other IT or IS systems, to be located at the hapū corporate offices. Foundation is responsible for creating the legal Trust Deeds, and any End User License Agreement (EULA). The development team of System Engineer and Knowledge Engineers will be reassigned as support staff responsible for keeping the system operating 24/7 through the provision of a Help Desk.

The client whether a hapū, marae or privately owned will also use AI as a mātauranga-a-hapū repository and would have unique specifications to the design. It decides, based on the data collection interview Matua Hek with other elders to contain within a private partition of the He Pātai© repository, esoteric information. That it has very limited accessibility and as a security measure, will not appear in any directory unless the sign-in code of the inquiring governance or executive is present in a security-based placed folder online. This is also a the kāhui responsibility.

Mātauranga Māori and AI

Earlier I used the analogy of Braille, a system of touch reading and writing for a visually impaired person to interact with the unseen world. AI in He Pātai© is like the human brain

that has been programmed to receive and manipulate information that the finger sensed on the embossed paper source.

Programmed in its Knowledge Base and Inference Engine, He Pātai© has the rules and procedures based on kaupapa Māori (Smith, 2003) and tikanga Māori (Mead, 2003), partner underlying philosophies and any specific hapū processing. The latter could include any mātauranga and tikanga exceptions to general knowledge and rules.

So, while there is knowledge (a book) on one hand and AI (the mind) on the other, how will the two connect? For AI, the HMMead_Algorithm©⁷³ is the sensor, editor, translator, and validator of te ao Māori. Refer to the graphic description of the algorithm at Figure 3. Here the four aspects and six principles are expressed to include AI:

- The tapu aspect (Mead, 2003 p.337) that respects all aspects of the handling of taonga will be created from the initiation of the data handlers at the initial hapū wānanga for He Pātai© through to its implementation and support functions. No food will be partaken in the area of data preparation. Kāhui has the discretion to prohibit persons from viewing the raw data, as do they, to hire whomever they need providing they have the pukenga with first preference going to a hapū member. Moreover, they have the authority to declare the tapu or noa of the project.
- The mauri aspect – implicit (Mead, 2003: p. 338) in the structural data whether based on te ao Māori or the trading partners, whether tangible (statues, carvings, weapons, hei tiki or other artefacts), or the intangible (photographic images recorded data in the binary form ‘0’ or ‘1’, magnetic form) each is imbued with the life principle, will be handled on tikanga to be articulated by the kāhui.

⁷³ Legal copyright for the algorithm is based on Mead (2003).

- The take-utu-ea test – (Mead, 2003: p. 341). Deals with perceived or actual breaches of tikanga, partner underlying philosophies and Aotearoa New Zealand legislation. Foundation will code and program a form of ‘collision tracking’ mechanism to detect and resolve or, interrupt processing and ask the governance or executive inquirer for resolution. The ‘organic’ tikanga routine could override tikanga (lore) breaches but would reject outright where no similar routine exists. Such as in a partner philosophy or in the case of a breach of legislation.
- The precedent aspect - (Mead, 2003: p. 338). As the name implies, AI will save each successful transaction as a ‘precedent.’ Subsequent What If? inquiries will note previous similar transactions and may recommend a particular action to a new query.
- Whanaungatanga – networks required to support this project include whānau, marae, other hapū, the academy and technical advisors. Through Foundation, the project will keep abreast with the technology leaders in addition to the academies. Malleability is the capability for shaping decisions based on recommendation by peers whether within the hapū or external sources.
- Manaakitanga – regular hui with updates to the project team and the steering committee comprising the kāhui and hapū leadership would meet this principle.
- Mana – the dynamics of prestige or mana is underpinned by the rules of precedence that are embedded in the kinship system (Mead, 2003 p.52). This principle may be dispensed with through ‘organic’ tikanga by the kāhui to meet the exigencies of the project. The modification of this principle or others is decided by kāhui acting for the ‘steering committee’ who are answerable to the rūnanga rangatira.

- Noa – Mead (2003: p. 347) defines this principle as ‘normality’ and with reaching a state whereby a new idea is accepted, incorporated into the thinking of people and no longer is a cause for controversy.
- Tika – Beyond the collective rights within hapū there is also the need to conform to international standards in the construction and development of He Pātai©. Foundation is charged with that responsibility using the International Standards Organisation in ISO 11620:2014⁷⁴ to be compatible with others including trade partners and state-owned repositories. For hapū, the tool is also a liquid asset meaning it (or more accurately, a copy of it) can be used to pay a debt or, be sold outright on the international markets. Such a contract maybe a turnkey operation whereby hapū assumes a partnership to market the Knowledge Engineer expertise in a consultancy role. If the tika or rights are implemented correctly then the sale and servicing of the AI will become a substantial export earner for hapū.
- Whakapapa – Mead (2003: p. 218) describes as criterion of hapū membership. The data provides hapū with family genealogy.

Regular maintenance routines for He Pātai©

As the hapū corporate expands its markets, business philosophy, its internal marae and whānau based philosophies are added to its database. The permutations may go beyond what was originally collected as taonga tuku iho to form new generations of information that will interplay with the original and current content.

⁷⁴ SIRF© the Sinic-Iwi Research Foundation as the NGO for this research project will apply for certification. Researcher currently holds ISO certification for the Te Mei Ngarama Rapihana Foundation©

In the Sinic-Iwi context, there will be coordination between cultures for the interchange of information whether in English, Māori and Chinese. Those same processes that address the cross-cultural implications would form every part of the joint venture discussions.

Skill levels and competencies and their implications for Artificial Intelligence

While most would view AI as a ‘science’ and not an ‘art’, this researcher would from the standpoint of a practitioner, view it as being both. Why? Well, writing computer code that ‘talks’ to the Operating System (like its boss), or asks for new data (e.g. date/time), then messages a ‘tikanga’ (e.g. for the validation of a new ‘class’ of tikanga) that, when the processing is completed, the result it sends maybe described as a ‘new’ body of knowledge containing new truths.’ That is a *science*.

Now, the *art* is in *how* the Systems Engineer writes that same computer code that executes all those same processes is written. It needs to manage the handling of those truths through complex algorithms such as HMMead_Algorithm© or invocations and / or communicating with external sources (such as the language translate tables containing mita-a-hapū or Hanzi or Kanji in a Chinese computer alphabet translate table.) For even though the artistry in writing computer software can be described as ‘elegant’, it might even return false responses to the executive. That would highlight a fault, not of the mātauranga or in the way the internal coding of that mātauranga was faulty but in poorly written by a human who is also capable of making mistakes or being wrong. These failures must be identified prior to the computer code being promoted to the AI through a ‘walk-thru’ process. This is described like it sounds, by depicting each step and decision point on a white or black board using chalk and duster. AI is not magic for this is the level of simplicity of how it works just like the human mind. The magic is how fast it ‘thinks’ – the speed of light, 299,792,458 meters per second.

Talent and creativity

In writing about traditional Māori beliefs Mead (2003, p. 254) communicates that a talent for the creativity of the traditional arts comes to the individual through the parents and down through one's ancestry. The erudite supports that assertion through research carried out by Neich (1977), who found that talent for the creative arts emanates from one's ancestor. To Mead who then compares that finding by Neich in naming the well-known Ngāti Tarāwhai carver Kaka Niao of Te Teko who died in July 2001 as a gifted carver whose outstanding skills, were not from a family line, but from being unique.

Whether creating the ES & AI software, both technologies must be viewed simply as tools whose purpose is to link a hapū/iwi back to its past by different ways that Mead (2003, p.21) teaches us,

that tikanga Maori are not frozen in time although some people think that they out to be . . . links us to the ancestors, to their knowledge base, to their wisdom. What we have today is a rich heritage that requires nurturing, awakening sometimes adapting to our world and developing further for the next generation.

Even from my hapū, Ngāti-te-Ao, there is total agreement in what Mead (2003, p.27) teaches that the value principle in tikanga means according to (Williams, 1998) more than rules and regulations to meet the various culture tests of appropriateness, correctness and adequacy.

Minimum data necessary to drive the waka – He Pātai©

Chapter one articulated the motivation for and enumerated the challenges that this research would undertake to resolve some outstanding internal conflicts faced in managing the multi-million-dollar non-westernised corporations. While some have been settled newer challenges have arisen as they evolve into the billion-dollar in assets trajectory; bedrock beliefs are being challenged, the need remains to have a distinct society (Uz, 2014). While every capital-driven

corporation whether westernised or tikanga-Māori, the primary needs remain the same: a highly trained and motivated workforce alongside astute executives and keen oversight by the governance body. What sets the Sino-Māori joint venture apart are those bedrock and fundamental values: mātauranga-a-hapū based philosophy and the PRC corporation driven by Confucian Virtue. They both have a narrower than usual interpretation⁷⁵ of modernity. Other leading civilisations may specify fealty to a philosophy dating right back to their origins or in some cases, an internal political shift – communism to a liberal democracy. Regardless, each have a set of values, in the case of Sino-Māori, whanaungatanga / guanxi, as the start point from which to begin negotiations for the interchange of goods and services.

The data collection phase was complemented by extensive whakawhanautanga and korero in hui and informal gathering. Matua Hek settled on these tools that serve two purposes; protecting tikanga and providing topical and business data to develop new markets and value networks, then to design and sell new products and services.

Promised AI systems performance based on hapū capacity and capability

In the preparation of the He Pātai© Functional Specifications (a formal/legal document and mandatory requirement of the IS/IT industry) to meet the User requirements and more importantly, the strict demands of the Funders, who will underwrite capital costs, a number of causal antecedents were performed. Quantitative research methods that emphasise objective measurements of empirical, statistical, and the numerical analysis of data collected were deployed. These tests were not performed in isolation: a peer-reviewed secondary evaluation of the practise scenarios, test mode scripts used, workflow was examined with step-by-step ‘walk-thru’ followed by the evaluation of the ‘actuals’ versus ‘expected’ performance results.

⁷⁵ For tikanga and Confucian virtue shape our worldviews.

To establish the milestones for the He Pātai© AI project timelines, two sources SOURCEFORGE (2018) and TENSORFLOW (2018) were interrogated for the computer software that includes programs, documentation, tests and test results for a given number of projects comparable to this project's deliverables. Due to the nature of data it was decided not to create in-house libraries. The capital and labour costs could not be justified. Following a 'desk-top' evaluation a prototype version of He Patai© was created using existing Microsoft© and Personal Computer hardware and software. The proven System Development Life Cycle, an interpretive quantitative approach was deployed to test both systems to display the process flow and the mapping of concepts that illustrate data manipulation with the migration flow generating the design, then workable versions. As Mead (2003; p. 260) highlighted the need for the waka builder to make a determination of the natural floating position of a log without having it in the water, so must the Systems Engineer weave the various software packages into supporting the hardware and software from the different vendors. A computer system is made up of two primary component parts: software (computer programs, data records and an operating system such as Windows© or Apple© being the major players) described as tangible and hardware – the physical devices that adorn the desktop or tablet or within a cellular telephone. Each computer is made up of many parts that need to be compatible with each other in order to perform promised functions.

Hui e, haumi e, taiki e - migration of mātauranga Māori to He Patai©

Traditionally a waka or canoe of 21.36 metres or more in length was built from two Totara trees then joined at the centre point. Mead (2003; p. 260) speaks to the relationship between the tikanga and judgement that the maker must make in order for the craft to meet its specifications. Matua Hek emphasized the same needs when designing the waka materials

including the bindings for the twin-hulled waka taua in order to accommodate the stresses and strains imposed by wind through its sails and the keels by water pressure. Throughout the building processes from the selection of the Totara trees to the launch, there were rituals and karakia involved in all aspect of its creation. The penultimate step was the conjoining of the two hull parts into one piece. The ritual and karakia could be visualised as follows:

- Speaker: “Kia tina”
- Everyone: TINA
- Speaker: haumi e, hui e
- Everyone: TAIKI E

The above dialogue will be preceded by korereao and karakia that is followed. At the joining of the two halves of the canoe the rangatira will recite “haumi e, hui e.”

“TAIKI E,” will complete the joining actions. Haumi e, hui e, and Taiki e, have no equivalents in English.

Migration of mātauranga from the marae to the ES is a highly complex process preceded by the editing, verification and validation of the artefacts produced by the Knowledge Engineers. Following electronic compilation mātauranga will be transmitted in digital form through a variety of means into the ES memory. Data diagnostics will be performed to ensure the data sets are correct with query entries to enter the HMMead_Algorithm to be validated against Mead (2003). If the implementation is successful it will be handed over to the governance entity for their testing and acceptance sign-off. In the event of failure, diagnostics will be performed to determine the reasons. After the anomalies have been resolved then an implementation will be performed. There may be many iterations to ensure the integrity of mātauranga transference.

Re-tooling the Māori enterprise of today.

Specific to this thesis is what Mead (2003, p. 21) teaches us to provide the tools whose purpose is to link a hapū/iwi back to its past by different means. This research believes that He Pātai© is that tool to serve all aspect of business including guaranteeing the underlying Māori culture of tikanga. That is the bottom line: whether it has been established as a norm, or rule of thumb by pedigree (whakapapa) for how governance should behave. It also has an inbuilt flexibility that authorises using the expression of extent, through invoking a practise of ‘organic’ tikanga or in the Neo-Confucianist case, when dealing ‘wealth’ and ‘power’ for today, their ‘Confucius for a today’ (Bol, 2012).

This thesis assumes that Māori and, hapū should resume its traditional role of being a trader and follow in the footsteps of the exporters (and importers) for prosperity once enjoyed must be restored. Specific to this thesis is the positioning and roles of entrepreneurial leadership supported by the general IT and with the introduction of AI.

These findings are laid out under the research questions to identify whether the research has anything to offer Māori corporate leadership and to academia and whether there is potential for further research.

Rolling out new technologies guided by Māori management principles

Tīparetia tō iwi ki te mātauranga o nga tīpuna.
Adorn your people with ancestral knowledge.

The paper titled Human Resource Practice (Spiller, Craze, Dell and Mudford, 2017) lays down the ‘five ancestral strengths and three recognition narratives.’ The document presents findings from fifteen managers to create the human resource management (HRM) based on ancient values. The ancestral strengths being Mauri Ora, whanaungatanga, tangata whakapapa, hūmūārie (practicing humility) and the Tūakina-Teina, creating effective

succession through mentoring. While these qualities from the social sciences perspective are outstanding, whakapapa, that may be viewed as nepotism, or promotion by virtue of descent could be problematic in today's corporation. It then becomes incumbent on the corporate leader to 'weigh up' the tikanga of equal importance in Kotahitanga (unity). Tribalism as a 'state within a state' would be detrimental to the enterprise. Today's hapū corporation have leaders selected on aptitude, merit and successful public or corporate service. and merit has its place in today's Aotearoa New Zealand society. It is from that perspective that opportunities be offered to candidates, based on aptitude alongside the other listed strengths to support He Pātai®.

Yet, the narratives of personal identity, community and performance are fully supported in the nurturing of potential AI practitioners and industry leaders. Of equal importance are the qualities they will play in the cross-cultural business environment as succinctly described,

performance narratives are a dynamic and responsive process of reflection
. . . enable deep levels of human perception and intuition . . . that life is
transformative . . . create the reality that unfolds within an organisation
. . . material and spiritual relationship connects to a wider reality which
creates a sense of duty.

The hapū identity narrative: AI is holistic

The word hapū literally means 'pregnant'. It is also the governance of whānau and marae. Each has whakapapa that interconnects those within and neighbouring or distance kiwi and other hapū. There is te reo Māori and the mita of the hapū, pūrakau, waiata, with tribal and whānau stories. During its lifetime there has been interaction with the central government whether through the Māori Land Court or through historic treaty settlement with the Crown. If a settlement was reached that produces the Post Settlement Governance Entity that was ratified

and established. It contains the settlement redress under a Deed of Settlement. This focuses on the hapū future – a roadmap to plot temporal and physical direction. All these elements must be considered in making commercial decisions. AI contains the collective identity and the ‘face’ of the hapū and must be accessible to its members. This becomes an imperative when making commercial and succession decision concerning its future.

Why tikanga should also be concerned about AI

As in the human qualities elaborated in Spiller, Craze, Dell and Mudford (2017), AI could also be used as a tool of inculcation – the instilling of knowledge (good, bad or indifferent) or values in someone, usually by repetition. One example could be the influence of non-Māori religious doctrine that is in conflict with tikanga-a-hapū such as birth right – the tapu of the person (Mead, 2003) or the rights of a whangai person that affects descent. This is seen as the role within the hapū tikanga group such as the kāhui kaumātua or, the arbiters of tikanga to verify. Left unresolved it may also be a breach of tikanga.

Introducing AI to the whānau, marae and to the education sector

Building on and embracing the wairuatanga of the Community Narrative in the paper, Foundation is engaged with the leadership of a Kōhanga reo and Kura Kaupapa Māori to teach AI with mātauranga Māori applications. Teaching proposals have also been sent to non-Māori educational establishments promoting AI using computer game⁷⁶ applications to demonstrate the ease of creating AI for fun.

⁷⁶ Modifications to Microsoft Flight Simulator FS2004 to create AI aircraft and Scenery & Textures to establish New Zealand airports not sold in the original game product.

Establishing compliance with AI technologies to Māori governance and tertiary institutions

Embracing the Identity Narrative, Foundation has responded on its own behalf to the New Zealand Department of Internal Affairs reviews of Government Algorithms with an outline of the HMMead_Algorithm©.

Moreover, the HMMead_Algorithm© in its first iteration presents a holistic picture to AI, Block chain technologies and other algorithms with not only of Mātauranga Māori, its cross cultural partner bedrock philosophy but of the rules and regulations (national, international legislation and conventions (for dispute resolution) as its identity narrative. Presently in 2020 no other mechanism exists.

The Functional Documents, Technical Documents, User Documents were submitted to Te Puni Kōkiri under the title of “Establishing Tikanga Māori compliant Algorithms, Artificial Intelligence and Block Chain Technologies.” The purpose being, ‘Let the record show’.

The same documents were submitted to Te Wānanga o Aotearoa as a proposal for a prospective course syllabus of instruction.

A technology company formed as a deliverable of this Professional Doctorate

The He Pātai AI Systems Limited cooperation with Company Number 7821762 with one director and is seeking an AI Data Scientist, is registered in New Zealand. It is not funded by any state agency.

Establishing the concept of the kahui for an AI driven hapū corporation

The Community Narrative (Spiller, Craze, Dell and Mudford, 2017) talks of, “expanding the organisations own potential; laying out a future which shows its operating to its highest ideals.” Critical to the realisation of that aspiration is how, “leaders align the goals of the individuals

they lead with the values of the (hapū).” That introduction to the Performance narrative calls for values that are transformative. While this research introduces what could be perceived by some as another layer of ‘elders’, it will present to hapū, a support group that has tikanga foundations but requiring a different set of skills, some new to support the overall objective of creating inter-generational wealth. This research through Community narratives observe through its teaching capability, aptitude and potential coupled with tikanga, customs, protocols and the values of the organisation, “while incorporating a generative Māori philosophy throughout.”

AI as a hapū teaching tool

He Pātai© will have baseline knowledge and scenarios from which to develop the Sinic-Māori dialogue as a component in the Knowledge Base. The What_If query. e.g. ‘when, why, what & how’. The Inference Engines will parse the questions and determine the response according Rules based instructions. An authorisation code associated with the inquiry will first determine whether it may invoke the ‘exceptions’ for ‘organic’ processing. Other exceptions scenarios would include the ‘**when**’ to observe seasonal activity such as Matariki or Qingming or the Chinese New Year also known as the Spring Festival in China. These dates are important to developing guanxi and whanaungatanga to observe special days.

The scenarios of ‘why’, could indicate to the relative partner in a multi-partner relationship any note of cautions or suggestions with by generating an appropriate response with suggestion of alternatives.

Should AI processing find an exception whether a philosophical, legal, national or a local practise then the ‘what’ response would suggest as a possible interim answer with recommendations.

The ‘how’ verb instruction for AI will be the most complex for even the smallest ‘exception’. The expertise to construct the responses will be solicited from the hapū, kāhui, clients and the academia.

Will the proposed AI design specifications return an evaluation and discovery of geographically semantic changes within a reasonable response time?

Simulations using the Foundation’s PC executing CLIPC© produced responses from 1 – 5 seconds. Exits were created and tested with the appropriate error response.

Is there the capability to interface with another ES belonging to a trade partner?

The Peer to Peer (P2P)⁷⁷ network technical capability or protocol will be the subject of each of trade negotiations and contractual agreement. Hapū technical and kāhui kaumātua will interface with their counterparts. The access will be via the Internet to exchange files that have been created and structured using ISO standard file systems. To protect inter-corporate files the Point to Point Encryption (P2PE) will also be deployed using the standards established by the PCI Security Standards Council Payment solutions. This will be part of the Application Programming Interface (API) scheduled to be established during phase II.

Will the generated responses to a query be available in te mita-a-hapū?

Initially, the English and Māori language interface will be used until hapū have created its own dictionary of kupu necessary to express dialect and even nuance.

⁷⁷ Computing or networking is a distributed application architecture that partitions task or workloads between partners such as intra-iwi or hapū to a NZ government agency, Internal Revenue Department, Stock exchange or any other partnership.

How could the findings be applied?

Chapter 1 outlined the partnership between the three players being the Researcher, My Hapū and the Academy. It is proposed to negotiate with the academy to be part of an ‘external’ steering committee.

The efficacy of AI for hapū governance.

While the benefits of this tool have not been evaluated in a hapū corporate environment, it offers many benefits providing laudable outcomes over and above its primary function of producing sustainable tikanga decisions. That result is dependent on three processes: codification of the knowledge base; codification of the HMMead_Algorithm© to analyse data and to learn patterns and to glean insights from the data in its Knowledge base; and, training of governance to use the tool effectively. That responsibility lies with this research and Foundation.

Conclusion

This case study is an investigation into how to create an ES with the AI component for He Patai©, to provide governance and the executive a tikanga based decision towards meeting the corporate aspirations. In applying a kaupapa Māori framework, the path would be an evolutionary process towards creating a repository of hapū mātauranga that is then used to move a business idea initiated by a “What_IF” query through algorithms (described in Chapter 1) including the HMMead_Algorithm©, the kernel based on Mead (2003) for validation then a response to the person who initiated the question.

CHAPTER SIX Findings and the discussion

Case study one – He Tūhonotanga – connecting the cultures

Introduction

The goal of this professional doctorate thesis was to create the pathway enabling two great cultures with different underlying bedrock philosophies to unconsciously make trading decisions and take actions while holding true to the tenets and fundamental beliefs.

Since the start of this research six years ago there has not been any comprehensive Sino-Māori linked research material except for contextual excerpts from company annual general meeting reports.

Application of research to practical problems, formulating solutions and complex issues.

Fortunately, the PD research format was offered enabling actual professional experience in both cultures, languages and philosophies to be translated and shared to support the Māori traders to China. Moreover, it enabled the design and delivery of management techniques using AI, Algorithms and ANN serving the governance and Operational Researchers in exercising hapū/iwi tino rangatiratanga. Moreover, with TENSORFLOW© and ANN the AI will deploy interpretive argumentation theory exploring texts from both philosophies with the objective of generating equitable decisions 100 times out of a 100 using a dialogical process that is interactive.

Research materials

There was an abundance of Confucian Philosophy in business scholarship published in the English language that provided substantial material for this study. On Māori in business the scholarship presented by various scholars also in English came from the Social Sciences as

being “indigenous”⁷⁸. While that term is used exclusively by the Social Sciences it was never used by the Māori corporate owners or indeed by my whānau, hapū or iwi. During the overseas research phase, they referred to Māori-owned for the Haka branding exercise used by the New Zealand All Blacks and New Zealand Māori All Blacks was well known.

Tikanga Māori

The daunting challenge for any non te reo Māori speaking governance or executive entity is that tikanga is unwritten, or is unconsciously held, or not clearly stated. However, there is the implicit need for it to be understood for it was foundational to every person or organization to live and to making decisions. During data collection if the dialogue with an obvious Māori person was in te reo Māori there was tacit or a real knowing of its meaning even though the person may not elaborate (possibly because of the lack of expression skills). Whereas, talking with a non-Māori executive there was response of deference and consultation with an ‘expert’. Every hapū trade negotiation began with the solemn promise of sustainable tikanga-based decisions; transforming the leading iwi businesses into multi-million-dollar enterprises.

Viewing tikanga Māori from an international perspective

This researcher saw through international experience how a prospective partner would also view tikanga Māori alongside one’s own bedrock beliefs as a form of business intelligence tool to interrogate, find commonalities and find where equity existed. But what could not be seen immediately were the nuances. But the extent of the complexities, could still be scoped, analysed and resolved through technology. Through training, practice and the collection the

⁷⁸ While serving on the Board of Directors for the Khowutzun Development Corporation of the Cowichan First Nations in BC, Canada, the term First Nations was used to define their standing and heritage in the nation and abroad.

kāhui could after training (by this research) integrate, analyze and present the data in a form to support the business decision-making calculus.

Just as importantly is that the foreign partner could also view tikanga Māori as a disposition towards trust; a deterrence-based trust for a long-term relationship; as well as some context for dispute resolution; and a history of prior relationships. All this, while today, tikanga is based on ‘word of mouth’ that one day (as a result of this research) is to be codified in the Information Sciences form to meet the requirements of AI. Within Māori Jurisprudence (The New Zealand Law Commission, 2002) Tikanga Māori has been legislated but is unsuitable for AI purposes (Vranes and Stanojevic, 1995). This research could not find peer-reviewed scholarship for any other society /civilizations that operated without ‘written rules.’

Tikanga Māori implications for international trade partnerships

As to its utility, Mead (2003; p. 353) asks whether:

tikanga Māori is only for Māori or whether people of other cultures are free to participate, our duty is to protect its integrity, its dynamic aspects, its range of variables that impinge not only how it is interpreted but also how it is practised.

As our trade partners utilise Artificial Intelligence with Business Intelligence daily in supporting their governance decision making, hapū is duty and tikanga bound to meet Mead’s exhortation by ‘protecting its integrity’. Such is the tapu of our underlying principle.

Tikanga Māori as a corporate core value

Every Māori corporation has this guiding principle to meet their vision and mission statement of creating inter-generational wealth. The three exemplars for this research were effective managers expanding their tikanga driven corporations to serve the world’s largest markets were

hired⁷⁹ for their business acumen. The executives were dependent on guidance by governance (hapū members), the kāhui, or ‘arbiters of tikanga’.

Questions for discussion:

- a) what forum/dialogue took place between the two groups to ensure tikanga? In one iwi, each hapū around the rohe were asked to present the rūnanga by September each year with a ‘wish list’ with attached supporting documents and an estimated cost. The tikanga Māori and the merits were agreed at the whānau, marae and hapū levels. A democratic process.
- b) How was tikanga security applied to the general business principles? Compliance was based on someone knowing a potential breach such as a rahui or other prohibition such as a pending arbitration e.g. Iwi Forums position of ‘Wai Māori.’
- c) Where cross-bedrock principles were in play, what was an acceptable period to determine their resolution? One exporter had permanent representation abroad with daily contact with the client base. Another had a strategic partner representative within its board of governance to advise on these matters.
- d) While Tikanga/Confucian virtue defines behaviour in the corporation⁸⁰ as opposed to the community, are there are instances where through ‘delegated authority’ there might be a situation of being pragmatic? None was found within tikanga however, in Bol (2012) the “a Confucius for today’ was suggested to be pragmatic. Caveat: this research concedes that arguing the findings comprehensively of ‘matches’, ‘fits’, ‘mitigating factors’, ‘issues’, ‘any dynamics against this match’, and to ‘key practical benefits of the findings in this thesis’ would require a complete PhD comparative study of its own. That notwithstanding, within

⁷⁹ The assumption being that this is an interim step until hapū rangatahi with Te Reo Māori and Mātauranga Māori proficiency may follow education and training serve an internship preparatory to joining the corporation.

⁸⁰ Within the whānau, marae or hapū rūnanga, tikanga resolution maybe instant for the Rangatira has the final say. Pragmaticism also reigned.

the limited space of this professional doctorate, it will raise the issues from the business principled standpoint only. (Moreover, while it is acceptable after a lifetime speaking te reo Māori and living tikanga Māori to speak of our philosophy, it is totally unacceptable and presumptuous to attempt another without fully living their experience.)

e) How is information available and presented to the non-Māori executive to satisfy the tikanga Māori aspect of a business proposition?

f) Would the multi-billion-dollar export corporation be prepared to invest in the modern tools such as Tikanga Māori compliant AI, ANN and ES or, continue to use the ‘white board’ and ‘marker pen’ approach to problem resolution? While no interest was found within the scope of this thesis, today in March 2020, with the Coronavirus Disease (COVID-19) crisis, US based AI and ANN are reporting in the Harvard Business Review (2020) the impact it is already having on the global economy. These tools would help locally to plan its contingencies such as raw material ordering or the adjustment of capital funding.

g) A perceived difference in the meaning of tikanga at the export corporate level was that it is a *norm*, as being prescriptive, rather than proscriptive. At stake between two societies/civilizations is mana and the Confucian virtue of Pinyin: *Ren Chinese*: 仁). To reiterate, the Sage Confucius defined as

wishing to be established himself, seeks also to establish others;
wishing to be enlarged himself, he seeks also to enlarge others.

Research perceives Wairua in both underlying theories that projects a spiritual side, a capacity to have faith and what holds people together. Neither is a religion although some view it as an important part of their comprehensive approach to living.

Perfect Positive Correlation in Tikanga comprehension is fluency in Te Reo Maori

Two non-Māori, Meng Foon (Who is Meng Foon, n.d.) and the late Judge David Ambler (Ambler, 2008) had one thing in common: both spoke te reo Māori fluently and were orators who used tikanga Māori narratives effectively to illustrate their roles as leaders in the Aotearoa New Zealand communities. Research asserts that te reo Māori proficiency and understanding of tikanga are directly proportional, and that both are inextricably linked regardless of ethnicity or race of the speaker.

Leadership qualities under tikanga Māori

The cultural pattern of vertical collectivism applies to both parties in a Sinic Iwi relationship. The individual must see the self as an aspect of an in-group, that is hierarchical in nature. For Māori (Mead, 2003: p. 210) leadership is determined by birth or blood line. There was no shortage of feedback on this issue from former military veterans of which there were many in the hapū and iwi of Te Tai Tokerau.

Veteran-1 put it this way: “[o]f course, for us veteran’s, leadership was viewed differently, where mana was imposed by rank, quite differently from the marae setting.”

Also, ***Veteran-2*** chimed in his own inimitable way, saying “[l]eading is a gradual learning process. Something I don’t see in our rohe right now. Mana? Not sure what that is, let’s wait and see, eh?”

Comment: In fairness, their application of the term leadership was in conflict situations, in battle or in the stricter regimental basic training mode for those situations are coined as ‘hard power’.

To that point, ***Rangatira-1***, a proven pre and post historical treaty settlement iwi leader contrasted with ***Diplomat-1*** on the notion of ‘soft power’. The latter stressed its use on the ‘big

stage' of international diplomacy resulting in the China New Zealand Free Trade Agreement of 2008. Whereas *Rangatira-1* found his use of 'soft power' within his iwi got mixed results even to the point where they felt he as leader had gotten 'softer' in a protracted intra iwi disagreement.

Historical precedence was raised by *Wāhine-1* for her admiration for the inspirational leadership of the late Whina Cooper who as she stated, "set an example for us all women in her devotion to the community first, and then to Maori."

Fellow veterans proffered their experiences gladly in *Veteran-2* who spoke of leadership shown by his SAS leader, "a driven person, of exacting standards for self as well as us soldiers."

Interestingly *Veteran-3*, a former NZSAS Regimental Sergeant Major and later a Māori TV reporter went to the core of leadership describing inspiring humility in a Māori leader.

For someone who learnt that morning he would become governor-general would still wear a Rotarian's apron with a collection-bucket at the Wellington central railway station fundraising the Christchurch earthquake victims earlier that week. You couldn't get any better than that. . .

An exemplar was another former NZSAS officer. *Kaumātua-3* who explained that in leadership, "[t]ikanga exudes a calmness permeating through the hui and the roles that both women and men play on the marae." Yet, *Rangatira 2* offered an interesting counter point that on leadership and trading with other nations stated, "that we as Māori should not change for others. Don't (sic) make sense! Tikanga? The Ten Commandments are my tikanga."

Wāhine-2, a seasoned executive in the banking sector extolled the virtues of kaupapa Māori that drive her interactions with clients in the office, on the marae and with clients of the social services. *Pākehā-1* (the CFO of Ngāi Tahu, a thesis exemplar) who that week was made "The

Best Senior Executive in NZ” title said how fiercely proud it was to work in an enterprise whose governance was based on mātauranga Māori.

Leadership discussion on the social and commercial bodies within hapū

Today, the reality is that hapū commercial holdings are led by outstanding individuals who were appointed on merit - through a transparent selective process. However, the rūnanga would still be selected through the traditional process stemming from the whānau, marae and hapū subordinate bodies.

Discussion around automation in any tikanga based activity

Kaiako tikanga-1 – (Personal communications) Uses tangihanga - the ultimate cultural expression as the metaphor in his response to the proposition of AI to guide tikanga. The objection was to the use of machinery for the manual process was a ritual intensive preparation of the rua tūpapāku, the grave or burial hole for a deceased person. The concern was communicated this way:

[t]angihanga involves tikanga based manual labour. The use of the mechanical diggers as a breach of kawa and is now exacerbated in the live streaming of the tangihanga service from funeral homes.

Another objection voiced by Matua Charlie Tawhiao (in personal communication) was the act of placing tikanga in a computer system for that equated to the removing of a taonga and treading on mana and wairuatanga of the person who would normally be called upon to present that information. Research who respects that position asked whether that would be any different to that which is in written form in the publication Mead (2003), as an authoritative

guide to tikanga Māori. While conceding Mead (2003) does indeed articulate mātauranga, an assertion was that the knowledge transfer should only occur during the 'daylight' hours. Matua Charlie offered the notion of developing 'organic' tikanga where one did not exist for a given situation and that coincided with the principle of 'a Confucius for today' espoused by Bol (2012).

Discussion on bedrock compatibility/incompatibility on Confucian ethics and application of tikanga Māori in the business discourse.

To reiterate, a caveat was expressed earlier,

What are the matches?

Refer to Figure 11 for the qualities of both that should form the governance characteristics based on five management principles used by the University of London (1994) and recommended by Low and Ang (2013a). Research revealed matches. In the absence of peer-reviewed data from someone who has worked rather than theorised, I will need to fall back on personal, practitioner experience within the Confucius Ethics based work environment. The physical workspace environment was typical for most parts of South East Asia denoting a physical hierarchy. Within our single office of immense proportions sat over two hundred and fifty employees some dressed by colour code. All females regardless of rank wore green smocks. At the top table was a director, three divisional managers sat in slightly smaller desks with backs to that superior. The American managers and consultants sat at adjacent tables. At the end of each lengthy bench sat an immediate supervisor who could observe employee productivity for there were no dividing walls in the entire office. One coffee and Chinese tea maker served the entire office. Piped music

signalled the start of workday; Tai-Chi at mid-morning and the announcement for lunch of thirty minutes at 1155am. As foreigners, we joined senior management at the head of lunch line up, other employees waited till we had been served. A siesta/sleep of 30 minutes following the lunch of vegetarian food was at our job workstation and mandatory. Superior executive staff sat behind glassed walls surrounding the 'office' space. Well dressed, unsmiling individuals were strategically placed amongst us. My Chinese male colleagues were immensely proud military reservists and would leave unannounced at times. Most took time out on leave to fast and meditate. They identified as Taoists. Despite these disruptions the productivity levels were high (fostering the feeling of sisterhood / brotherhood 禮, lì); and, we met our deadlines on budget (practicing loyalty (忠, zhōng). The learning curve for us foreigners was gradual and smooth.) Philosophical matches? Their managers and supervisors were thoroughly bi-lingual, patriotic, world-travelled, and gladly shared whanaungatanga/guanxi with us, being benevolent (仁愛, rén ài) to our families and their extended families.

What seems to be the fit?

Leadership were educated (Low and Ang, 2012) from the best US institutions and practised self-discipline and self-cultivated themselves. Moreover, they embraced Confucian values that influenced corporate culture, were of high integrity (no self-interest or personal gain) in order to meet the corporate goals. The chairman, president, and owner (of the multibillion-dollar world-wide corporation) who dressed ordinarily (grey slacks and blazer) would ask to join our meal table (和 hé píng in peace and harmony). He obviously cared for the employees. At Ngāi Tahu Holdings© I witnessed the same kinship experiences of kinship for Tikanga Māori is the guiding principle.

What are the mitigating factors?

The experience showed me what living by Confucian Ethics is like when practised 24/7 for 365 days of the year. (Its efficacy was demonstrated during the Coronavid-19 pandemic where mitigation practises such as wearing face masks were a daily norm reducing the spreading of colds and was instituted with no pushback thus reducing infection rates.) For Māori, the reality is being a colonialised race and that living by Tikanga Māori is only practised in the home and marae. This research asserts that in time, with kohānga reo and kura kaupapa Māori education, the present generation will with tertiary education in international business produce the Tikanga Māori compliant executives for the hapū corporations.

What are the issues?

Once again, research revealed that there are many viable conceptual frameworks but without conceptual schema that will in time, meet this perceived shortfall in developing the so-called model of a 'tikanga Māori' executive. In the meantime, Māori export businesses are creating a pathway. Two examples of hapū owned corporations (Vinamilk raises stake in New Zealand's Miraka Company, 2015); Ngāi Tahu Tourism, n.d.) are actively using Tikanga Māori principles to promote trade with China and elsewhere in the world.

What are the dynamics against this match?

Pragmatism Uz (2014) described hybridisation that this research accepts and has theorised as the form acceptable based on tikanga principles. A version of modernity (Hall and Ames, 1999: p.66) includes a Chinese definition of capitalism that this research asserts as being pragmatic. My research revealed historically Māori traders and today's exemplars

uphold a pragmatic definition of capitalism to meet their goal of generating intergenerational wealth. The other variable against is that the political winds of change could affect the match such as rescinding (NZ-China Free Trade Agreement, n.d.) trade agreements or a decision by the central government to sever trade ties. Presently China represents this nation's largest trade partner. An issue of scientific rationalisation was raised by a non-business rangatira who stated that tikanga Māori decisions may not be exercised outside of daylight hours. This research will seek 'other' like exceptions to be included in AI.

What are the key practical benefits of the findings in this thesis (based on the Tikanga Māori/Confucian Virtue relationship)?

From the Social Sciences standpoint it is the re-establishing blood ties expressed by Sharples (2012) and to follow through with the assertion that Confucian Philosophy and mātauranga Māori (including Tikanga Māori) gave 'the moral and philosophical compass to any trade relationship'.

Combining the business/trade and social sciences aspects, this pact is the first trade relationship where commonalities have been explored beyond the blood ties and there is enthusiasm expressed and a sense of purpose (Ngāi Tahu Website, n.d.) described.

From the Information Technology and Information Sciences standpoint, the development of a tool to support cross-cultural trade using AI, Algorithms, Artificial Neural Networks and Block Chain technologies maybe a 'first'. In doing so, this application establishes tikanga compliance for elements of both the AI technologies. Just as important is the fact that every business principle is investigated closely to also ensure

compliance. (A comprehensive, proprietary AI Dictionary and Thesaurus was also developed for the He Pātai© tool.)

Both supporting philosophies are highly complex and to guarantee the sustainable, equitable decision 100 times out of 100, was a formidable task; but doable. The total He Pātai© combined databases are complex to reflect the ritual functions of each bedrock philosophy.

Perceived limitations

In the literature review a young Māori executive of a leading iwi corporation wrote to a leading New Zealand daily espousing a position that attempted to equate or to find equivalence of tikanga Māori roles within the context of the modern corporate structure. As the iwi corporation proudly traded as a tikanga-Māori based enterprise, the suggestion was made for the appointment of two officials in governance: one as a ‘tikanga Māori officer’, the other a ‘kaupapa Māori officer.’ There were issues at play: in declaring itself as a tikanga Māori corporation obviates the need for both officials. For, in the unlikely event of their appointments, each could be overruled or voted against based on the principle of majority⁸¹ voting? Lack of te reo proficiency by the proponent revealed the limitations of understanding what tikanga meant. Research asserts that the failure to comprehend tikanga compliance rendered the notions superfluous.

Integrating business practises

Māori corporate officers, particularly the exporters have successfully integrated their core roles of marketing, sales, production, development and the underlying philosophies through a consultative process by using a ‘tick-the-box’ method. The decision is then based on the ‘best-

⁸¹ The majority vote in a parliamentary procedure means ‘more than half the votes cast.’

quality' data information provided at that time. While using the 'best practises'⁸² to comply with standards, contract specifications, law that is documented, the challenge may still lie in providing a sustainable tikanga-a-hapū decision for business. Recall that a partner with or without its own underlying philosophies may also need to access hapū data through its own AI (under a previously agreed authorisation) to ensure a fully compliant transaction. Research considers that tikanga-a-hapū as having canonical⁸³ status requiring it be formalised, documented and codified.

Recommendation and practical actions from the discussion

- Work has commenced by this researcher in the coding and programming of Mātauranga-a-hapū that includes tikanga-a-hapū to reside in the Knowledge Base and Inference Engine for He Pātai©. (See Figure 12 for a snapshot of a Personal Computer platform-based AI).
- Promote and rank the HMMead_Algorithm© to the world-wide AI community as a tool for hybridizing cross-cultural relationships based on the partner bed-rock philosophies (Advancing Technology for Humanity, n.d.).
- Continue building proficiency in te reo through reading and writing a journal on a daily basis. The goal being to convey unhaltingly, this kaupapa in the boardroom and marae.
- Active liaison with rangatahi in the kohānga reo and kura kaupapa learning streams to promote mātauranga with IT/IS alongside mathematics towards AI as career choices.

⁸² A **best practice** is a method or technique that has been generally accepted as superior to any alternatives because it produces results that are superior to those achieved by other means or because it has become a standard way of doing things, e.g., a standard way of complying with legal or ethical requirements.

⁸³ status for it is accepted as having all the qualities that a thing of a kind should have. In IS each is an interconnected repository: business data, business law, treaty law, hapū-centric treaty components (PSGE), underlying philosophies such as tikanga-a-hapū and perhaps Confucian virtue. Canon refers to a collection of rules or texts that are considered to be authoritative. Collectively they drive the hapū business model to provide sustainable decision making.

- Active membership with the iwi forum leadership and community to provide further liaison with visiting PRC trade delegations.
- Active participation with the Sinic community in Aotearoa New Zealand and abroad.

Conclusions of Case study one

The primary goal for this research's is delivering prompt and sustainable tikanga-a-hapū that delivers equitable decisions. This must be the commitment as the cornerstone for any bi-lateral trade agreements; a responsibility cannot be delegated to a third-party. Tikanga encompasses the rules of being correct, true, upright, right, just, fair, accurate, appropriate, lawful, proper, and valid and has been ratified by the whanau, marae and hapū and promulgated to all hapū corporate decision-makers.

Under the authority of kāhui kaumātua and with this researcher's supervision, the data needs will be sorted and organised to build mātauranga with embedded commercial information to meet the sustainability objective.

Conclusions of Case study two. Findings and discussion

The ES/AI architecture in layperson's terms (An Examiner's suggestion)

Outline – 1 Every decision made by the multi-billion-dollar export corporation carries several inherent risks hence the need for sustainable equitable decision-making capability at a guaranteed rate of 100% percent of the time. The consequences could be dire or embarrassing. A decision is not made in isolation and involves experts from the different departments who contribute their input. Professor Simon (1991) (articulated earlier) describes decision-making as highly complex and that we all have cognitive limits, or a history related to the decision or working with *known unknowns* – in the case of a non te reo speaking person making a tikanga based decision. An example would be the tikanga principle of rahui or prohibition; that is

serious. AI is aware of **all** Tikanga Māori and indeed Confucian Virtue Ethics will evaluate the decision-path and flag any issue 24/7 and in nanoseconds. Within every head office with AI is a business support group with educational backgrounds in statistics and mathematics. Their responsibilities include keeping the databases updated. They will be augmented by experts in tikanga and mātauranga Māori and Confucian Virtue Ethics. AI is frequently used by multi-million-dollar corporations worldwide to avoid errors. (Personal confidence in IT/IS dates back two decades.)

Outline – 2 The HMMead_Algorithm©. Today, nothing exists that interfaces the Māori worldview to current AI, Algorithmic, ANN or block chain technologies or other AI systems. This proprietary algorithm meets that need.

Outline – 3 While the previous case study defined the data elements derived from the Social Sciences (culture, economics and law), the Humanities (geography, history, languages, philosophies), this sub-chapter introduces the Applied Sciences (computer science, information sciences, engineering and technology). This research further adds the engagement of epistemologies and different ontologies / sub-ontologies of Chinese, Māori, Pākehā cultures and of the Information Sciences.

Finding-1: The kernel or core to deliver equitable decisions lay in the two bedrock philosophies: Confucian texts with accompanying commentaries have been formally codified into a codex, a book of law. While mātauranga (including Tikanga Māori) has not.

Discussion-1 Use Information Sciences structures that encompass representation of either of the bedrocks in the form of ontologies and sub-ontologies. Similar structures will be constructed to create a dictionary and thesaurus holding business principles with their associated weighting values of 1-5 and the associated footnotes. Additional structures will include the application of customary law to facts as necessary. These structures will constitute 99% of the **Expert System** that deals with **Rules** and **Inferences**.

Finding-2 Both bedrocks have unique ‘exceptions’ and use ‘tacit’ knowledge elements.

Discussion-2 Python or C# or Java# driving AI and ANN will deliver efficient processes.

Finding-3 What would an Expert System (with AI) cost?

Discussion-3 He Pātai© AI Systems Limited is sensitive to the financial challenges facing the industry and wants to minimise service fees and charges to the extent possible within the scope of each hapū project. A client may purchase a Turn-key operation or utilise this project’s capacity as a service.

Discussion-4 *Tikanga and inequity.* While tikanga, that holds to customary and traditional values that applies equally to each member of the hapū/iwi, a closer look reveals that is not necessarily true. For inherent in tikanga is the principle of vertical collectivism, a cultural value that is characterised by emphasis on cohesiveness but also holds to the view of bloodline – of hereditary rights, including that to leadership. In the hapū context, there are legal implications for individuals like me who are not from the ‘rangatira’ bloodline for the Courts would uphold the leadership choices based on the decision of the hapū rangatira. This is based on case-law and a peer-reviewed publication by Judge Stephanie Milroy (2007) and the former Chief Judge of the Māori Land Court (and now), the Honourable Justice Joseph Williams (1998) of the New Zealand Court of Appeal. There is, however, the opportunity for the hapū rangatira and its membership to ‘create’ a tikanga that allows selection based on merit. From an unselfish point of view, would that not benefit all hapū? The ‘new’ tikanga must however, be promulgated and made explicit in the hapū pakihi Trust Deed based on Aotearoa New Zealand legislation, namely the Trustee Act 1956.

Should that perceived inequity not be exercised then all is still not lost. For a tikanga (albeit modified) option is available to whānau in the family-based business option where a succession plan is explicitly stated in the Trust Deed, the whānau or family may choose their leader from within or indeed, from an external source.

Discussion-5 Should the word profit be used in the hapū vernacular

Although Haugh and Tracey (2004) argue that the social mission prioritises social benefit above financial profit for the social entrepreneur, there is a discernible reluctance by Māori sociology researchers to the use of the word ‘profit’. In a report titled *Insights on Māori Social Enterprise* (2017), Te Puni Kōkōri, an agency within the Ministry of Māori Development conveys the following:

practitioners expressed discomfort being termed social enterprises or social entrepreneurs. The critical point of dissonance appears to be the use of the term enterprise, which some feel compromises the integrity of their commitment to driving their kaupapa or social impact mission.

In response to the concerns of the practitioners the agency proposes the use of the term **Pakihi whai kaupapa** to frame the Māori social enterprise discussion. A literal translation means “business with agenda”.

Despite their low-key profiles, today’s Māori exporters such as Miraka, Wakatū and the tourism importer Ngāti Tahu Tourism have, based on annual filings to their shareholders reported a comprehensive list of company’s activities with satisfactory results for the past two years. These annual reports are intended to give shareholders and other interested parties such as investors, a financial performance. Additionally, the leadership has also been awarded recognition for job performance.

The research set out to create hope in the form of pakihi for my hapū. Sadly, our village had changed its demographics, to retirees-only, who could not support that kaupapa.

The academy had earlier challenged me to seek resolution on an irritant in an intra-iwi relationship. (From personal governance experience, a situation not that uncommon) At issue, the notions of ‘power’ and ‘wealth’ in that relationship. Initial thoughts were to examine the Pākehā underpinnings – the legislation that demarcated each entity. In Aotearoa New Zealand

jurisprudence there is a ‘rule of thumb’ in any intra iwi dispute, both tikanga (Mead, 2003: p.216) and the Courts of Record are both in total agreement – seek rangatira decision - for they rule, that simple!

CHAPTER SEVEN – Thesis conclusion

The Journey

Being raised in a bi-racial and unilingual nation of the 1950's was to see Māori continuing to be disadvantaged. The Native School system provided me with an opportunity to be bilingual: English at school and Māori in our home. Those foundations helped my international career immensely. The US undergraduate degree in Computer Science and the Master of Business Administration enabled a career with leading multinational corporation in business research in Canada, France (twice), Germany, South America, then Asia in Malaysia, Singapore, and Taiwan.

On retiring to Aotearoa New Zealand came the opportunity to revisit Te Ao Māori through further education by upgrading personal skills in a te reo, tikanga Māori, marae protocols and more importantly, the restoration of confidence to stand and mihi at a tangihanga on my tūrangawaewae and other marae. Connections were made with the strong and dynamic iwi leaders from in Te Moana-a-toi while at first-year Law at Te Piringa Law School, Waikato University. Matua Charlie Tawhiao, a rangatira of Ngai-Te-Rangi of Tauranga Moana kindly and unselfishly imparted mātauranga never heard before ('organic tikanga') in Aotearoa New Zealand. It was then that the decision to undertake the Doctoral research degree at Te Whare Wānanga o Awanuiārangi.

The publication Tikanga Māori (Mead, 2003) has been encapsulated (in the IS context, in methods and data) for the Information Sciences forming an object-oriented programming that bundles data.

The validation mechanism named the HMMead_Algorithm© is part of He Pātai©, a query system that uses "What_IF" scenarios to process tikanga-based decision-making.

The professional stint in Taiwan as a Systems Engineer in the Confucian-based multi-national fostered a fondness of their language and culture that continues today. During this research I travelled back to Malaysia, Singapore and the PRC to gather background information that would help to form the partnership database for this professional doctorate.

This thesis from the IS perspective serves as a continuing functional specification for the next phase which is the actual development of the production vehicle for, He Pātai©. The prototype platform has limited functionality, enough to provide training of specialists who will become hapū Knowledge Engineers. The Sinic-Iwi Research foundation©, the legal non-profit non-government-organisation will serve in a leadership/mentor role with volunteers from both hapū and a local technical institute to develop the initial database from Mead (2003).

Open-source software from CLIPS 6.3 and Tensorflow© with the Mozilla ‘speech to text recognition software’ is underway creating components in AI. The development platform is Microsoft’s Windows.

I was proudly raised as a Māori and New Zealander and consider myself an immensely proud Kiwi who had also served in the uniform of its Defence Forces. I would also pay tribute to many Pākehā who have also opened their doors to me, and I am truly grateful for that. For Air New Zealand Limited who took me on at entry-level to gain the knowledge and experience in their Information Technology department. I simply arrived with a diploma in hand and without any experience; that opportunity translated to a rewarding world-wide career.

Practical implications

Presently only one iwi corporate in Aotearoa New Zealand, Te Ngai Tahu Tourism is actively trading with the PRC using Ngai Tahutanga as their strengths to demonstrate what and how a Māori corporation can operate as a Non-Westernised civilization. They are a potential user for

He Pātai©. The production version of the ES and AI will be is extensible, meaning through modifying and enhancing CLIPS© 6.3 and Tensorflow© shipments with artefact creation and modifications that may be used by any partner in the Comprehensive and Progressive Agreement for the Trans-Pacific Partnership or CPTPP, the successor to the former TPPP.

Current Activity

Under the hapū leadership I will continue the direction of research that has begun into developing and documenting the Ngāti-te-Ao mātauranga that will be codified to form the database for He Pātai©. Using the international standard ISO/IEEE the HMMead_Algorithm© will be formalised using the ISO/IEEE standard under ISO/IEC JTC 1 – SC6 that is responsible for Telecommunications and Information Exchange between Systems to provide a seamless path to computer systems internationally regardless of the hardware manufacturer. The Ngāti-te-Ao hapū has Intellectual Property rights to the datasets within He Pātai©.

Project development

Using Microsoft Project© as a scheduling tool the proposed implementation date is in the first quarter of 2020. Using the SDLC methodology and planning software, the development effort, duration and costs have been estimated. Funding proposals have been crafted and submitted for consideration. Training programmes for the hapū Knowledge Engineers is now complete.

Suggestions for future work: Foundation will seek potential customers who have or are presently hybridised clients.

This scholarship was the culmination of years in a profession that I thoroughly enjoyed. My wish is that this body of knowledge would meet the needs of the critical mass of cross-cultural traders and provide a basis for future researchers to advance the future of Sino Māori trade.

My gratitude to Te Whare Wānanga o Awanuiārangi who was gracious in awarding me a full one-year research scholarship. I cannot speak higher of my teacher and mentor Professor Virginia Warriner, who was willing to share skills and expertise in this art. Positivity in her role taught me the values of ongoing learning and growth in this endeavour.

E te Mareikura, kanui te mihi ki a koe mo to tautoko me te aroha hoki, Tena rawa atu koe.

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Appendix 'A' Ethics Approval Letter



TE WHARE WĀNANGA O AWANUIĀRANGI

16th March 2015

Ed Robson
14/27 Stonehaven Drive
RD8 Maungakaramea
WHANGAREI

Tena koe Ed,

Re: Ethics Research Application EC 15-215ER

At a meeting on 16th Mar 2015, the Ethics Research Committee of Te Whare Wānanga o Awanuiārangi considered your application. I am pleased to advise that your submission has been approved.

You are advised to contact your supervisor and the Ethics Research Committee wishes you well in your research.

Yours Sincerely

A handwritten signature in black ink, appearing to read 'P. Kave', with a long, sweeping flourish extending to the right.

Associate Professor Paul Kave:

Acting CHAIR

cc: Associate Prof. Virginia Warriner (Supervisor)

WHAKATANE	TAMAKI MAKAURAU (AUCKLAND)	TE TAITOKERAU (WHANGAREI)
13 Domain Road	Building 1	Raumanga Campus
Private Bag 1006	19 Lambie Drive	12A Murdock Crescent
Whakatane 3158	Papatoetoe	Private Bag 9019
New Zealand	Auckland 2104	Whangarei Mail Centre
		Whangarei 0148

Appendix 'B' Covering Letter for Participants



TITLE OF PROJECT: Kaupapa Māori and International Marketing

Covering Letter/Information for Participants

Dear Doctoral Research Committee:

I am currently a student at Te Whare Wānanga o Awanuiārangi, studying for the degree of Professional Doctorate.

The purpose of my study is to examine how Kaupapa Māori works in with International Marketing.

Each year more Māori owned businesses are entering markets overseas and being successful. I will use international and national research and theory with my own international experience in North America and China to help Māori businesses to meet their full potential.

Participation

Information will be gathered through interviews and resources available. These will include various meetings with Hapū, businesses and the various marketing organisations. Verbal consent will be obtained from meeting participants prior to these meetings and where, specific comments are used, written consent from those participants will be obtained. Where it might be useful to have more detailed comment you will be asked, prior to the meeting, to agree, to audio recordings of these meetings and discussions. Where these regular meetings are relevant to this study, you will be advised beforehand and anyone not participating in this study will be given the opportunity to withdraw. It is your right to withdraw at any time up to six weeks following the final sharing back of the information.

Confidentiality

Each participant has the right to be anonymous and to use a pseudonym however names will be used if participants prefer to do so. All raw data and evidence will observe requirements of confidentiality. Participants are informed that despite the best efforts of the researcher, absolute anonymity and confidentiality cannot be

guaranteed. Any audio tapes used will be transcribed by the researcher. Any raw research data, including audio tapes or digital recording, will be archived indefinitely with the Te Whare Wānanga o Awanuiārangi Ethics Committee guidelines.

Findings

Findings will be submitted to Te Whare Wānanga o Awanuiārangi as a doctoral thesis and may be subsequently submitted to journals for publication or as papers for conference presentations. Findings will be shared with the Hapū and business communities.

Your Rights

If you agree to participate your rights are as follows:

- To refuse to answer any question at any time
- To ask questions about the study at any time
- To provide information on the understanding that your name will not be used (unless you give permission to the researcher)
- To be given access to a summary of the findings of the study when it is finished
- To be given a copy of any material, including audio recordings if you ask for one
- To have the right to withdraw up to six weeks following the final sharing back of the information with you
- To complete and return the questionnaire implies consent. You have the right to decline to answer any particular question.

L.L. (Ed) Robson
14/27 Stonehaven Drive
RD 8 Maungakaramea
WHANGAREI 0178
AUCKLAND 2023

Contact: Phone: Home: (09) 432 3766
Mobile: 021 181 1407
Email: School: eddierobson@email.com

Supervisor: Assistant Professor Virginia Warriner

Te Whare Wānanga o Awanuiārangi
Private Bag 1006
Domain Road
Whakatane

THE LIST OF QUESTIONS

A list of questions for both Chinese and Māori interviewees? Their style and wording are based on a Confucian Values International research project. The strengths and weaknesses were discussed with those researchers.

- a) Do you wish to conduct the interview in Chinese or English or Te Reo?

- b) Would you like to use the services of a competent translator? If so, I will meet the cost of the translation services.
- c) Would you mind if I record your response to the following questions?
- d) May I use your name? Your company names? Or do you wish to remain anonymous?
 - 1) What are your thoughts on quality service and service excellence?
 - 2) Is there a relationship between family values and retailing techniques?
 - 3) The value of peace & harmony?
 - 4) The value of entrepreneurship?
 - 5) The value of sustainability?
 - 6) What do you need to know when you want to do marketing on a product?
 - 7) Do you think that family values and retailing techniques are important to marketing?
 - 8) What is the favourable environment or strategic position in marketing?
 - 9) What is your opinion on entrepreneurship?
 - 10) When are you planning to retire?
 - 11) What are your thoughts on Kaupapa Māori principles in general, in business?
 - 12) What are your thoughts on Confucius Principles or Tao Principles in business?
 - 13) If you answered 11 and/or 12, do they have value in today's business climate? If so, Why?

I reserve the right for additional questions for the purposes of clarification. To meet the ethical standards set by the academy a certified transcript of the responses to those questions will be cleared by you with an official translation before submission as part of this research.