The Indigenous Mapping Waananga 2017

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Introduction

The concepts of cartography and Geographic Information Systems (GIS) are not new to Maaori. In fact, Maaori have been doing cartography and working with GIS since the beginning of time. In the Western world, cartography is defined as the art of map making[1] and GIS is defined as "A geographic information system (GIS) which lets us visualize, question, analyse, and interpret data to understand relationships, patterns, and trends".[2]

A GIS, as understood by Maaori, could be defined as a paataka korero tuku iho, a central repository of whakapapa (genealogy),[3] and traditional knowledge, which has been passed down from generation to generation. Cartography then, could be defined as the visualisation of the koorero tuku iho such as pepeha (tribal sayings), whakairo (carvings) taa moko (tattooing) paatere (chant/songs), whakataukii (proverbial sayings), and whaikoorero (speech making). These concepts are integral to the way Maaori express themselves and their relationships to their environment.

Cartography, and GIS, are constantly being redefined by the advancement in technology and the integration of internet interactive maps, 3D renditions and hyperlinks to multiple information sources. These advancements in GIS, have the ability to now create interactive maps, which, can be used to identify places of significance as well as to experience virtual tours, and have been incredibly significant for Maaori. Most importantly, and even more excitingly, is the ability for modern GIS technology to take on new visual forms of expression which are probably the closest they have ever been to expressing 'cartography and GIS' as Maaori have always understood it to be. As examples, we can use GIS to create a 3D map to present the different layers of a pa site, the whakapapa and hononga (relationships) that people have to whenua (land).

When Maaori were first introduced to modern GIS technology in the mid to late 1990s there was a mad rush to go out and buy software such as MapInfo, which was a relatively innovative GIS software at the time, as a 'must have'. Over the last 20 years, my observation has been that for most iwi organisations (tribal organisations), the ability to sustain their GIS has been challenging due to the following factors:

- expensive hardware costs over time;
- the need to sustain software costs over time; and
- the costs of baseline datasets, for example satellite imagery.

The accumulated costs and long-term investment required by iwi organisations meant that it was unsustainable for many iwi to maintain their GIS with limited funding and resourcing. However today, hardware, software and baseline datasets are more accessible and affordable than ever before. The adoption of a New Zealand Geospatial Strategy [4] to

make spatial data freely available and the integration of different types of technologies such as drones, augmented reality, web and cloud based services has meant that more iwi are able to use geospatial technologies in everyday applications to:

1) capture, preserve and present their oral and traditional histories;
2) visualise their cultural heritage;
3) manage their cultural and commercial assets; and
4) reconnect their communities to their cultural heritage and identity.

The development of GIS has occurred in tandem with the challenging and changing dynamics of the Treaty Settlement process in New Zealand and many iwi have turned to GIS to assist them in this process. While iwi have had to adapt to the increasing demands placed on them by the Treaty Settlement process, technology advancements such as Google Earth, for example, have provided iwi with 'new' tools to capture, collate, present and visualise iwi narratives using modern GIS technology. These 'new' tools create expansive opportunities for iwi and Indigenous communities culturally, socially, economically and politically.

As iwi and Indigenous communities become more aware of how GIS and the 'new' tools can support their aspirations, it is also important that they have opportunities to access the technology along with training. Furthermore, Hakopa (2011), identifies that a key problem is, how to translate an oral tradition's view of an ancestral landscape into a spatial tradition using modern spatial information mapping tools without that body of cultural information losing any of its integrity or cultural impact and, that the process is as important to the Indigenous mind as the end product. This leads me to an initiative called the Indigenous Mapping Waananga 2017 (IMW2017) which seeks to engage iwi and Indigenous communities with GIS and 'new' state of the art geospatial tools through the form of waananga.

Background

The IWM2017 grew out of an initiative called the Indigenous Mapping Workshop (IMW), which was first established in Canada in 2014 by the Firelight Group who worked in partnership with the Google Earth Outreach team to deliver expert training to First Nations participants.

In 2016 in my Google Earth Outreach trainer role I had the privilege to deliver training at the IMW in Vancouver, Canada where I decided to bring the workshop back to New Zealand. I delivered it for iwi under my company Digital Navigators Ltd in partnership with the Firelight Group, the Google Earth Outreach team, Kereru Associates, Meta Maori, and Land Information New Zealand. With support and sponsorship from a number of iwi, private and government organisations we also delivered a one-day waananga for rangatahi (youth) Maaori and a three-day waananga for iwi and Indigenous community representatives.[5]

The key objective of the IMW2017 was to provide opportunities for iwi and Indigenous communities to access technology, expert training, predominantly, Indigenous training within a learning environment where participants could apply the technology relevant to the context and practical experiences and realities we live and breathe every day. A key component of the IMW2017 is that training is delivered predominantly by Indigenous trainers with presentations and training embedding Indigenous values and traditions and, is focused on strengthening self-determination, cultural revitalisation and sustainable practice for our communities and the environments that we have kaitiaki (guardianship) responsibilities for.

The Indigenous Mapping Waananga 2017, Hamilton, New Zealand

Geospatial conferences are delivered all over the world, with a focus on technology advancements, the sharing and presentation of case studies as well as providing opportunities for growth and development. The unique perspective of this conference compared to others, is that the training was predominantly delivered by Indigenous trainers from an Indigenous perspective, which, integrated traditional cultural values and knowledge and recognised the relationship that many Indigenous communities have in their roles and responsibilities as kaitiaki (guardians) of their environments. The Indigenous Mapping Waananga (IMW2017) was a conference held in Hamilton from 15-18 May 2017 to teach participants how to use state of the art mapping and spatial data technology to tell their stories of connection with the land, rivers and oceans.

Over the course of four days, the IMW2017 was attended by close to 200 participants from iwi all around the country. Participants were taught how to use the leading mapping and spatial data analytics technologies including Google mapping software, ArcGIS, and QGIS tools in a hands-on training conference hosted at the Claudelands Event Centre. The first day delivered a workshop for rangatahi Maaori (Maaori youth) affiliated to iwi or Indigenous communities with established GIS or those undertaking GIS projects.

The conference endeavoured to share best practice with participants and provide an opportunity for them to hear first-hand how iwi and Indigenous communities are using GIS tools to support their aspirations and contribute to informing activities that promote and sustain their tino rangatiratanga (self-determination). The technical training was co-led by GIS experts from Digital Navigators Ltd, Google Earth Outreach, the Firelight Group, Land Information New Zealand, Kenex, and a global network of Indigenous mapping experts from Aotearoa, Costa Rica, Canada, Ireland and Italy. The key objectives of the IMW2017:

- Increase iwi and Indigenous awareness and understanding about geographical information systems (GIS) and infrastructure that will support them to capture, preserve, manage, enhance and present spatial and non-spatial information related to their iwi and tribal landscapes;
- Teach iwi and Indigenous communities to use geospatial tools so that they can

make better informed decisions about which tool will be support their needs; and
- Provide rangatahi Maaori an insight into geospatial technology as a valid career pathways and see the potential opportunities this sector can provide. The rangatahi one-day workshop targeted those rangatahi who affiliated to iwi and have been involved in the GIS sector, some with dedicated capability or who are undertaking GIS projects. An important driver here was to encourage iwi and rangatahi to consider succession planning, and building grassroots capacity and capability now to fill these roles with GIS skilled people from their own communities in future.

The IMW2017 was delivered in three streams across the three days, which taught and showcased the benefits and challenges of the following world leading geospatial technologies:

1) Environmental Systems Research Institute (ESRI), ArcGIS;
2) Quantum Geographic Information System (QGIS); and
3) Google's array of mapping tools (Google Earth/ MyMaps/ Street View/ TourBuilder/ Open Data Kit/ Fusion Tables).

These tools were chosen because they are the leaders in GIS technology and in many cases have been used by Indigenous communities around the world. The trainers were all familiar with these technologies and knew of case studies whereby the software technologies were used by Indigenous communities. The workshop streams provided hands-on practical training for participants to learn how to use each tool and identify which tool would be meet their needs.

Iwi and Indigenous communities all over the world are undertaking groundbreaking projects using these technologies. Presentations were delivered throughout the waananga by Indigenous representatives who talked about the application of these technologies to assist them with:

- Projects around navigational wayfinding and voyaging;
- Mapping the Maaori maramataka (calendar);
- Cultural and language revitalisation;
- Reconnecting tribal members back to their land, rivers, oceans;
- Genealogy and Treaty settlements; and
- The use of drone and the creation of real time data to inform decision-making.

In summary, presentations provided insights into how iwi and Indigenous communities around the world are using new tools to assist with some high impact projects. Projects ranged from:

- The development of a research mapping methodology, Direct to Digital (Olson,

Hackett, & DeRoy, 2016), by the Firelight Group, Canada by integrating Google Earth mapping techniques with research methodologies; to

- The creation of an holistic Ngaai Tahu tribal sites of significance search engine which integrates ArcGIS and tribal cultural values to meet the cultural needs of their tribal members; to
- Indigenous language revitalisation and the role of Google mapping tools to map and visualise the current state and wellbeing of languages around the world; to
- How Te Ruunanganui o Ngaati Hikairo use GIS within the New Zealand Treaty settlement framework to inform overlapping interests, freshwater management, tribal engagement, heritage management and the Takutai Tai Moana; to
- How Te Aitanga a Hauiti have integrated Google's mapping tools including Google Earth, Street View, Open Data Kit, Fusion Tables and MyMaps with local communities around the East Coast to develop a story telling and decision-making platform. Aspects of the platform are targeted not only to create greater awareness of local issues for the many tribal members who live outside the tribal boundaries, but also to support iwi members to make informed decisions around effective planning within the community; to
- Work being undertaken by First Nations and how geospatial tools are assisting them to realise their own aspirations; to
- The introduction of Drones such as the DJI series and software packages including Pix4D Capture, Drone Deploy, Litchi and Drone2Map and how they have influenced the way mapping is being done.

Outcomes

The overall objectives of the Waananga were to introduce participants to geospatial technology, provide information about free data sources and data sets relative to their own tribal landscapes and environments and strengthen their ability to use the technology to support the aspirations of their own projects. Further outcomes achieved included:

- Participants gaining a stronger understanding about GIS and what can be achieved through practical training and experience using the technology with expert trainers across the 4-day event and access to key presentations from iwi and Indigenous speakers on their projects;
- Participants feeling empowered to make informed decisions about which GIS would best support their aspirations;
- An opportunity for rangatahi Maaori to learn about GIS career pathways and for their iwi organisations to support growth and development opportunities for future succession planning in this area;
- Building and strengthening relationships for everyone involved through creating networks of support for iwi and indigenous GIS practitioners; and
- The opportunity to have robust discussions around how Indigenous communities

integrate traditional knowledge and korero tuku iho with modern technology while still maintaining tikanga into the future.

Summary

In summary, the Indigenous Mapping Waananga was a huge success and highlighted the need for this type of conference here in New Zealand. The IMW2017 achieved the objectives it set out to achieve for iwi and Indigenous participants to support participants to learn about GIS and state of the art geospatial technologies to support them in their projects and day to day applications. It was about educating participants of the different options available to them when wanting to incorporate GIS into a project that they have.

Feedback reflected that there was strong participation from key iwi, hapuu and whanau representatives who are working in kaitiaki roles and who are directly responsible for managing capturing, preserving, analysing, presenting and sharing information relevant to their communities and who are or would benefit significantly through the use of GIS technology.

In conclusion, what the waananga showed was that each iwi is dynamic with a different set of parameters. This particular hands-on training was a starting point for them to utilise and design a program that they can take ownership of using a set of tools, which, in my experience works. Many of the participants were grassroots advocates and there is no other initiative of this size in New Zealand that integrates maatauranga Maaori and exposes participants to the leading GIS software applications. A successful iwi GIS program must be championed from within the iwi and have a clear set of parameters that they have identified and which works across the total organisation. Maaori participation in this space is integral to the work iwi are doing on every level and will only grow as awareness, understanding of the tools, capability and capacity continues to grow. Fundamentally GIS is just a tool, no different to 3D printing or VR. What is important is that we retain our maatauranga Maaori and look to use these tools to enhance and assist Maaori in their endeavours. Hence, the significance of providing opportunities like this will continue into the future. Lastly, I would like to acknowledge the organising committee of Lillian Clarke, Jude Cornelius-Nuku, Duane Wilkins, Steve Deroy, Jeff Hackett and Kylie Ngaropo for all the work they did to make this a reality.

Endnotes

1. https://en.wikipedia.org/wiki/Cartography

2. http://www.esri.com/what-is-gis

3. A paper presented by AT Mahuika, 1996, *GIS Past, Present, Future: The Conception, Development, and implementation of Ngati Porou Information Systems*.

4. See https://www.linz.govt.nz/about-linz/our-location-strategy/geospatial-strategy-for-spatial-data-infrastructure/new-zealand-geospatial-strategy.

5. Partners included Digital Navigators Ltd, Google Earth Outreach, the Firelight Group, Waikato Tainui, Land Information New Zealand, Meta Maori and Te Kereru Associates. Sponsors included

Annies, Callaghan Innovation, Eagle Technology, Kenex, Manaaki Whenua Landcare Research, Ngaa Whenua Raahui, Te Kahui Manu Hokai The Maori GIS Association, Te Puni Kookiri and Te Tumu Paeroa.

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