17 Language Vitalization through Mobile and Online Technologies in British Columbia

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British Columbia's Language Context

British Columbia, Canada, is home to 203 First Nations communities, 34 languages and 61 dialects. Approximately 60% of the First Nations languages of Canada are spoken in BC. According to the *2014 Report on the Status of B.C. First Nations Languages*, 4.08% of BC First Nations speak an Indigenous language, 59% of speakers are 65 years or older and 65% of communities have access to recordings of their language. Research has shown a link between a strong linguistic and cultural identity and an increase in social, mental and physical wellbeing (First Peoples' Cultural Council 2014). Communities engaged in language vitalization have observed increased rates of high school graduation, which include mature students returning to complete basic education and heightened motivation to attend University and other post-secondary programs. Currently, language apprentices from across BC are completing Master's Degrees to prepare them to support language vitalization in their communities.

The First Peoples' Cultural Council (FPCC) is a First Nations-run Crown Corporation established in 1990 with a mandate to support the vitalization of Aboriginal language, arts and culture in BC. The organization works with a community-based committee of cultural experts representing the 34 BC languages to develop strategies that meet the unique needs of communities at various stages in their language vitalization efforts. FPCC supports communities to maintain, preserve and restore their languages by providing funding, training, capacity building and advocacy for language immersion. These goals are achieved through collaborating, planning, and archiving programs that support language and culture (First Peoples' Cultural Council). The organization also monitors the status of BC First Nations languages and publishes these findings to provide communities with baseline information and advocate for additional investments in language activities.

By the year 2000, the beginning of its second decade of service to BC language groups, FPCC was receiving numerous funding applications from community language teams seeking to record elements of their language on compact disc, the preferred language documentation technology at the time. Recognizing the challenges associated with distribution and updating

of language CDs for their community members, the FPCC Advisory Council decided to seek a more cost-effective investment that would better serve the diverse needs of First Nations language documentation activists.

The Beginnings of FirstVoices.com

FirstVoices is the innovation of elementary school teaching colleagues John Elliott and Peter Brand. John is the son of the late Dave Elliott, a language pioneer who in the 1970s single-handedly developed the unique orthography used by the WSÁNEȻ First Nation to write their SENĆOŦEN language. Following in his father's footsteps, John committed his career to his SENĆOŦEN language and culture, leading the language program at ŁÁU,WELNE̱W Tribal School, a First Nations elementary school located on Vancouver Island, BC, from 1978 to the present. Peter's earliest exposure to Indigenous languages occurred in 1971–1972 while teaching at an outback school for Warrumungu children in Australia's Northern Territory. Both men ascribe these early influences as critical elements of their passionate commitment to Indigenous language documentation and vitalization.

The duo first collaborated with Angus Gratton, an Australian high school student, on the development of the multimedia authoring software, Vocab LanguageLab in 2000. Vocab LanguageLab was designed to enable young users to create media-rich presentations by incorporating text in their Indigenous language, images, audio recordings and video. The enthusiasm of their students and fellow teachers for their initial innovation inspired John and Peter to envision similar language resources for a wider audience via the Internet.

A Collaboration with First Peoples' Cultural Foundation

The office of FPCC is only a couple of kilometers from ŁÁU,WELNE̱W Tribal School. Hearing about the work of John and Peter, then-Executive Director Simon Robinson stopped by the school unannounced on February 28, 2001, to meet with the two teachers and discuss their recent language technology experiments. When the pair described their vision for a multilingual web-based language repository, Simon recognized the ideal solution to the pressing needs of FPCC. As Simon drove away from that first meeting at 10.54 AM, the 6.8 Nisqually Earthquake shook the Pacific North West—an interesting foreshadowing of a groundbreaking new innovation for Indigenous languages!

When presented with the two teachers' vision for a web-based language archiving tool, the FPCC board committed seed funding to the development of a prototype, and Peter was granted a one-year leave of absence from his teaching post to lead the project for the First Peoples' Cultural Foundation (FPCF), the sister organization of the Council. From its roots as a simple table of words and phrases for the SENĆOŦEN language, FirstVoices

would grow to become a sophisticated database-driven online archive hosting more than 70 Indigenous languages in Canada, Australia and the USA. These humble roots have contributed to the project's success, and particularly to the trust placed in the project by so many First Nations.

The Launch of FirstVoices.com

FirstVoices.com officially launched in June 2003 following two years of development, including design input and focus group testing by Aboriginal consultants (Figure 17.1). In 2005, a companion set of interactive online games was designed to present the archived FirstVoices language data in creative learning activities.

Figure 17.1 FirstVoices.com website.

At its core, FirstVoices is an interactive multimedia dictionary and phrase collection containing thousands of text entries in many diverse Aboriginal writing systems, enhanced with sounds, pictures and videos. FirstVoices also offers tools for the recording of media-rich song and story collections. Some language archives at FirstVoices are publicly accessible, whereas others are password protected at the request of the language community. Using

FirstVoices, Indigenous communities can document their languages, and manage their own language resources. Once the data is recorded and stored, Indigenous communities may choose to make their language archive available via the Internet for study and cultural transmission. This makes the archives useful to many audiences, particularly teachers, who can incorporate the data in lesson plans and other language teaching applications delivered to Indigenous students.

In 2005, the BC Head Start program administered by Health Canada approached the FPCC seeking better access to FirstVoices language data for their young pre-reader clients. The request resulted in the development of FirstVoicesKids, which provided a new interface that is high on visual cues and low on text. Watching pre-readers skillfully navigate the site to learn and practice their language skills instantly confirmed the success of yet another community-driven innovation at FirstVoices.com.

FirstVoices provides an excellent opportunity for a two-way mentorship between youth and Elders. Recording language and tradition requires an intergenerational partnership. Elders speak the language and have knowledge of the traditions and culture, whereas young people are comfortable using technology. In this partnership, the Elders provide words, phrases, songs, stories and grammatical input while the youth use the FirstVoices application to upload and organize the data. This data can then be expanded upon and used by the community in the vitalization of their language for generations to come.

FirstVoices – Early Challenges

Most of the 34 distinct BC First Nations languages and multiple dialects use a variety of special characters not available on a standard English keyboard to represent the unique phonemes of each language. The adoption of these special characters occurred over several decades as various linguists, priests, missionaries, teachers, anthropologists and community members either borrowed from the International Phonetic Alphabet (IPA) and the American Phonetic Alphabet (APA) or created their own custom characters. By the year 2000, most BC languages had settled on orthographies for documentation and teaching. Some had already established large bodies of documentation whereas others were just in the beginning stages.

Prior to the introduction of Unicode technology, computer fonts were limited to 256 characters, including uppercase, lowercase, numbers and symbols. This meant that a typical font was already heavily loaded with Roman-based characters before the addition of Indigenous language characters. A document created in a particular font and shared with someone else could only be opened and read in that font if the recipient of the document had the font installed on his or her computer. The sharing and installation of special fonts added yet another burden to the often non-technical Elders attempting to adopt computers into their language programs. Also, early

custom fonts used by First Nations language activists could not be employed successfully in web browsers. Displaying First Nations language orthographies at FirstVoices and in related language documentation applications was one of the early challenges for the development team.

Font technology at the time was on the cusp of the 'Unicode revolution'. Wikipedia (2014) describes Unicode thus:

> *Unicode is a computing industry standard for the consistent encoding, representation and handling of text expressed in most of the world's writing systems. Developed in conjunction with the Universal Character Set standard and published as* The Unicode Standard*, the latest version of Unicode contains a repertoire of more than 110,000 characters covering 100 scripts and multiple symbol sets.*

Although taken completely for granted today, the simultaneous arrival of the Internet and Unicode technology in the lives of First Nations language activists is worth noting because of the profound impact and demands it placed on pioneering enterprises like FirstVoices.

Early in the FirstVoices prototype development, the team discovered Keyman, a keyboard remapping software developed by Tavultesoft, a small company based in Tasmania, Australia. The son of a missionary working in Laos, founder and Keyman developer Marc Durdin began exploring keyboarding technologies at age fourteen. By the time the FirstVoices team discovered his work in 2001, Marc's Keyman software was already in use by hundreds of minority languages around the world. FPCC bought a global license on Keyman to provide free custom keyboards for all BC First Nations users of Windows-based computers. Matching keyboards with identical keystrokes were simultaneously developed for Mac users.

Another early challenge confronting the FirstVoices team was the alphabetization of the online dictionaries. Unicode characters do not alphabetize in the same way Roman alphabets do. The problem was overcome with a simple but ingenious solution devised by technical analyst Alex Wadsworth. As part of the preparation of each new archive, community language teams are required to submit their orthography ordered in the way the community has agreed upon. Alex devised a tabular system to assign a number to each character. The FirstVoices database then utilizes the numbers in the table to artificially 'alphabetize' the orthography.

The other major challenge facing the FirstVoices team was the fact that every one of the 34 BC languages and multiple dialects uses a different character set and font. Fortunately the team discovered Chris Harvey, the self-titled 'language geek' at LanguageGeek.com. Chris had already devoted hundreds of hours to the development of font and keyboard technologies for Canadian Indigenous languages when the FirstVoices team discovered his exceptional expertise and commitment. LanguageGeek provides free fonts and free keyboard layouts that try to cover all of the characters necessary

for writing Native languages. Following the international Unicode standard, languages can be typed, read, printed, emailed and put on the web using these fonts (LanguageGeek 2014).

With the help of Chris Harvey, FirstVoices promoted, pioneered and lobbied for Unicode technology for all BC First Nations languages, and today more than 70 keyboards are available as a free download from FirstVoices. com. Keyboards can be activated to type in various word processing applications and a web version can be activated directly within the FirstVoices. com interface. From their pioneering work during the 1990s to the present time, Marc Durdin and Chris Harvey have been critically important members of the FirstVoices family. Indigenous language speakers around the world have much to thank them for in the technically challenging road to language literacy.

FirstVoices Training Model

The FirstVoices training model encourages engagement of as much of the local community as possible. If community leaders are interested in using FirstVoices to archive their language, they must first host a meeting to discuss the project and gain support from the community. Once the community agrees to archive with FirstVoices, they submit a letter from their policymakers and administration in support of the project. A contract is then drafted to state that the language data is owned by the community, whereas rights to the technology are owned by the First Peoples' Cultural Foundation.

The FirstVoices training model continues to evolve with the advent of new technologies. The first training session was delivered as a summer course at the University of Victoria, with trainees attending from 15 First Nations across BC and several from San Diego County in California, USA. It soon became evident that sending one or two trainers to a remote First Nation was far more cost effective than bringing trainees to a central location. In addition to being able to work with multiple trainees in the community, the FirstVoices trainers were also in a position to assess and resolve the variety of technical challenges that inevitably arose in the communities.

Because the FirstVoices development trajectory closely tracked the advent of the Internet in many of the small remote client communities, FirstVoices trainers often found themselves on the front line of community technical support. Professional technical support services were sporadic and expensive, with contractors billing for hours of travel to resolve relatively simple issues. The one- and two-week FirstVoices training sessions required the trainers to live in the community for the duration of the session, placing them in an ideal position to detect hardware and software issues and effect or recommend replacements and repairs. These services strengthened the bond between trainers and community members, paving the way for long-term relationships and ongoing technical support long after the trainers had returned to headquarters. Often, community language teams would be found

to be making do with older hand-me-down computers, some of which were incapable of handling even the most basic networking and Unicode requirements. This recurring problem soon prompted the allocation of a brand new computer and peripherals to each FirstVoices team as an essential requirement of each new project. This of course required recognition of the need and benefits by the relevant national and provincial funding agencies.

Currently, the advent of web-based 'remote access' enables the FirstVoices technical team to offer both training and technical support from headquarters. Some training and technical support is now delivered via video conference, but many client communities still prefer training on site, when funding allows.

FirstVoices and the Development of Mobile Technologies

Ever since its first tentative experiments developing tools for Indigenous language revitalization, the FirstVoices team has relied on First Nations community language champions and the First Peoples' Cultural Council Advisory Committee for inspiration, direction and feedback. In this way FirstVoices remains dynamic and responsive to its core user base. With the advent of mobile devices, the FirstVoices toolset expanded to include mobile dictionary and language tutor apps.

In 2007, the FirstVoices team partnered with Udutu Online Learning Solutions, a Victoria-based company specializing in e-learning software. In 2010, the FirstVoices Language Tutor was developed in response to requests from communities for an online language-learning tool.

The FirstVoices Language Tutor provides First Nations students with access to graduated interactive web-based vocabulary and conversation building exercises. Using this app, users are able to listen to a word or phrase, record themselves speaking, and compare the result with a recording of a fluent speaker. The online program also includes a student tracking system so parents and teachers can monitor progress through the lessons.

In 2007, Internet access was still not a reality for many remote First Nations communities in BC. In order to support these communities, the FirstVoices team needed to find a way to provide Language Tutor access, independent of the Internet. After multiple working meetings with Udutu, the concept for the FirstVoices Language Lab was conceived.

The FirstVoices Language Lab is an iPad-based language-teaching laboratory designed to deliver Language Tutor lesson content via an app. The lab contains its own small laptop server, Wi-Fi antenna, power bars, portable case and a set of iPads. No Internet access is required, thus enabling remote First Nations communities access to lesson content.

By 2009, the increase in the use of mobile devices prompted First Nations youth to request access to mobile language technologies. To keep up to date with the latest technologies, the FirstVoices team developed dictionary apps for use on the iPod, iPhone and more recently, the iPad. The dictionary

apps use a subset of content archived at FirstVoices.com and contain text, audio, images and video. As of September 2014, FirstVoices has developed 12 interactive dictionary/phrase apps, which are available as a free download from the iTunes store.

Whereas the mobile dictionary apps allow users to access language content from their mobile devices, the apps do not allow users to text in their Indigenous languages. In addition, the regular keypads on mobile devices were not capable of generating many of the special characters of Indigenous languages, making texting in these languages impossible for most First Nations people.

A special grant from the Department of Canadian Heritage in March 2010 funded research into the keyboarding requirements for mobile messaging in First Nations languages. In December 2011, FirstVoices approached the First Nations Technology Council (FNTC), a not-for-profit enterprise created to support the technology needs of First Nations in BC, to request support for the development of a keypad and chat app to allow users to compose and text using the unique characters of their Indigenous language. The FNTC agreed to fund the development, and in the spring of 2012, FirstVoices Chat was launched, allowing users to text using Facebook Chat and Google Talk.

FirstVoices Chat had a high-profile world premiere when BC's Lieutenant Governor, Steven Point, and his wife, Gwen Point, exchanged text messages in their Halq'eméylem language before several hundred delegates at the annual FNTC Technology Summit on February 24, 2012. At present, FirstVoices Chat provides custom keypads capable of texting in more than 100 Indigenous languages in Canada, Australia, New Zealand and the United States.

Conclusion

The common thread running through FirstVoices' 14-year success story is the extraordinary level of community engagement. The project was initially envisioned by two elementary school teachers with limited technical expertise working in a tiny tribal school. Their early experiments, intended to engage their increasingly tech-curious young students, demonstrated a valuable place for technology in the school language program. The lucky convergence of a need recognized by the leadership of the First Peoples' Cultural Council and the vision of the two teachers created a perfect opportunity for an innovative new use for the Internet.

An important reality of innovations like FirstVoices is the ever-evolving technical landscape. The underlying hardware and software employed by each element of FirstVoices require regular updating to keep abreast of new technological advances. Ongoing funding, innovative thinking and strong leadership are critically important to ensure that the priceless linguistic data collected at FirstVoices.com remains secure and accessible to language

teachers and learners. Numerous First Nations have entrusted First Peoples' Cultural Council with their language resources for safe-keeping and free, open access online and via mobile apps. The organization takes this responsibility very seriously.

Since colonial times, First Nations people have witnessed successive waves of innovation and experimentation, often at their own expense. The FirstVoices story is different. From the moment of the original concept to the present, the project has been led by First Nations people, for First Nations people. Each FirstVoices innovation has been carefully weighed by First Nations community representatives to ensure that it meets the needs and wishes of their constituents, particularly youth. One of the most rewarding and exciting aspects of the project is the forum it provides for enduring partnerships between First Nations elders and technically savvy youth. Each member of these partnerships brings important skills, knowledge and experience to the project, and invariably their lives are enriched by newfound mutual respect. The program has never been about profit, which in turn has drawn exceptional hard work, dedication and commitment from the many innovators and language champions who have contributed to its success.

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