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## **Digital Data Management in Kahnawà:ke**

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### **Abstract:**

Indigenous communities are addressing the ongoing impacts of settler colonialism through a variety of expressions of resurgence. Among these initiatives are those leveraging digital technologies. In the emergent network society, digital infrastructures and information and communication technologies are powerful tools that can support self-government activities. This paper documents the development of digital data management in the Mohawk community of Kahnawà:ke. Our study outlines how Kahnawà:ke supports community data management through an enabling environment that includes administration (policies, analysis, supervision), technical architectures (infrastructure, connectivity), data management systems, and personnel.

## Introduction and Methodology

Indigenous communities in Canada are addressing the ongoing impacts of settler colonialism through a variety of expressions of resurgence (Alfred, 2009; Corntassel, 2012, Simpson, 2011). Among these projects are those leveraging digital technologies, as First Nations and other Indigenous peoples take control and ownership of their means of interaction with the network society (Beaton & Campbell, 2013; O'Donnell, Kakekaspan, Beaton, Walmark, & Gibson, 2011; McMahon, O'Donnell, Smith, Woodman Simmonds, & Walmark, 2010). In this context, digital infrastructures and information and communication technologies (ICTs) are powerful tools that can support self-government and nation re-building.

One element of these everyday practical efforts of resurgence is control and ownership of digital data. In this paper we explore this work. We define digital data as the information generated by a community, encompassing research, education, finance, health, membership, housing, lands and resources and other areas. Across Canada, First Nations and their community intermediary support organizations (McMahon, Gurstein, Beaton, O'Donnell & Whiteduck, 2014) are establishing a range of projects to manage community data.

This paper documents a data management initiative in the province of Quebec, in the Mohawk community of Kahnawà:ke. We discuss how the community is working with its partners in the First Nations Education Council (FNEC) to set up an e-Community strategy that includes community data management. The e-Community refers to a holistic planning approach to ICT development adopted by First Nations (Whiteduck, 2010; Whiteduck, Beaton, Burton & O'Donnell, 2012). It suggests that data and data management tools, competencies, and capacities help with planning and decision-making, improve accountability, and measure success.

As a component of its e-Community work, FNEC partnered with the Kahnawà:ke Education Council (KEC) to develop and implement a data management system called CANO, which is now being rolled out to other First Nations across the province. This work is linked to the First Nations Student Success Progress (FNSSP), which is a federal government initiative managed by Aboriginal Affairs and Northern Development Canada (AANDC) aimed at providing First Nations with supports for community education systems. The lessons learned by these organizations provide examples for other First Nations who may want to take on similar projects. As an early-stage adopter of this process and technology, Kahnawà:ke demonstrates how community data management consists of interactions between governance decisions (policies and protocols), technical architectures (infrastructure, connectivity, devices), data management platforms (CANO), and human resource capacities (including training). Our paper describes how this process emerged in Kahnawà:ke.

This community-based research project was designed in partnership with FNEC and KEC over a period of several months; FNEC and KEC have been working together for many years and since 2008, FNEC has been part of First Nations Innovation (<http://fn-innovation-pn.com/>) and First Mile (<http://firstmile.ca>) projects, based at the University of New Brunswick. Research was approved by KEC and the Mohawk Council of Kahnawà:ke, and supported through a formal

Memorandum of Understanding (MOU) between the university researchers and the Mohawk Council. The research protocol was reviewed by the research ethics board of the researchers' home university.

Our research methods triangulate data from interviews, documentary research (proposals, reports, and presentations) and community site visits. These visits took place in two phases: initial planning in September 2013 and two weeks of community interviews in February 2014. KEC staff set up meetings, assisted with interviews and provided background information during these visits. The research team conducted semi-structured interviews with 22 community members involved in data management. Questions focused on how employees of community service organizations (primarily in the education sector) conceive of and use data, and sought to identify both opportunities and challenges regarding the role that data management plays in supporting self-government.

### **Digital Data Management and Indigenous peoples in Canada**

In the context of settler colonialism, Indigenous protocols regarding the collection and use of community information became troubled, as external organizations and individuals extracted data resources held by Indigenous communities for their own purposes (Tuhiwai Smith, 1999; Menzies, 2004). As Bruhn (2014) writes, problematic issues include “[l]ong-standing colonial relationships, experiences of vulnerability to decision-makers, claims of jurisdiction, and concerns about collective privacy” (p.1). For example, she notes three critiques made by the Auditor General of Canada (in 2002, 2004, 2008, and 2011) about the ways that the federal government (in particular AANDC) collects data from First Nations as a condition of funding. AANDC’s data collection was described as: too focused on outputs (resulting in an excessive reporting burden, increased costs, and inefficiencies); of limited use either to First Nations or to government administrators; and failing to adequately involve First Nations in data collection and management (p.9). Over recent decades, federal government agencies have increased the accountability requirements for reporting and funding proposals associated with services that First Nations organizations are responsible for delivering (see Gibson, O'Donnell & Rideout, 2007).

The report of the *Royal Commission on Aboriginal Peoples*, published in 1996 but involving a process that began in 1991, stipulates the absolute need for Indigenous communities to have complete control of information pertaining to different aspects of community life, including health, education and culture. These data management practices reflect the goals and focus of Indigenous resurgence. Over time, this focus was expressed in four principles: Ownership, Control, Access, and Possession (OCAP). In 1998, First Nations formally articulated the four principles of OCAP for data management (Assembly of First Nations, 2007). The first formal application of these principles was through the National Aboriginal Health Organization (NAHO) to protect Aboriginal control over health data, as expressed as an application of self-determination in research by the Steering Committee of the First Nations Regional Longitudinal Health Survey (Schnarch, 2004).<sup>1</sup> Since then, the four OCAP principles “have become the de

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<sup>1</sup> NAHO, set up to address the needs of First Nations, Inuit and Metis peoples, closed in June 2012 after the federal government (through Health Canada) cut its funding. Although NAHO’s funding has ended, OCAP remains in

facto ethical standard not only for conducting research using First Nations data, but also for the collection and management of First Nations information in general” (FNIGC, 2014, p.1). A 2007 AFN document outlines the four principles in detail (p.5). Ownership refers to the relationship of a First Nation to its knowledge, data and information. Control reflects the aspirations and inherent rights of First Nations, including in areas associated with data management. Access refers to the right of First Nations to gain access to, manage, and make decisions regarding information and data about their communities, wherever it is held. Finally, possession refers to the need for First Nations to retain their data, rather than it being housed in external organizations.

First Nations have developed a series of protocols pertaining to the collection, use, and sharing of community data. When engaging with external groups like government agencies or academic institutions, OCAP can help ensure legislative and policy protection. Jurisdiction over data rests with individual communities, and each autonomous First Nation has the right to determine how it is interpreted and enforced. First Nations also have the authority to decide which community data will be shared with external entities such as governments and researchers (Mi'kmaw Kina'matnewey, First Nations Education Centre, Keewatinook Okimakanak, 2013). In terms of their implementation, OCAP principles are linked to the lived realities of people and communities: since each First Nation is unique, approaches to OCAP take different forms across Canada. Each individual First Nation decides what OCAP means and how information about them is collected, managed, analyzed, and disseminated.

Many structural and operational barriers limit the application of OCAP in practice. The four principles seek to ensure the collective privacy of First Nation communities. However, federal and provincial legislation like the *Access to Information Act* and the *Library and Archives of Canada Act* compels First Nations to share information with external organizations and the public (see FNIGC, 2014, pp.1-4). Another challenge relates to access: First Nations often cannot access administrative data and records about their citizens that is in the possession of third parties, such as government agencies (Bruhn, 2014, p.12). Finally, many people in First Nations lack information about or knowledge of OCAP principles (FNIGC, 2014).

Given these challenges, First Nations are undertaking various strategies to raise awareness of and implement OCAP principles. These initiatives, which we position as expressions of Indigenous resurgence, are taking place inside local communities, at regional levels, and through national groups like FNIGC. This work involves First Nations advocating for policy and regulatory supports. It includes examples like First Nation privacy laws to assert jurisdiction over community data (FNIGC, 2014, p.7). First Nations are also working with third party organizations to generate protocols regarding the collection, management, and sharing of information. For example, Chapter 9 of the 2<sup>nd</sup> edition of the *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* (TCPS2) (Research Involving the First Nations, Inuit and Métis peoples of Canada) outlines specific protocols for First Nations' control of data

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place, and today is associated with (and trademarked by) the First Nations Information Governance Centre (FNIGC), and tied to the work of the Assembly of First Nations. In the past, the First Nations Statistical Institute was also tied to this work, although that organization's funding was also cut by the federal government in 2012.

associated with research projects.<sup>2</sup> Another example is the regional and local agreements worked out between First Nations and third parties that restrict data-sharing to minimal levels required by law or contract.

One well-known example of an attempt to implement OCAP principles in practice is the First Nations Regional Health Survey (RHS) administered by the FNIGC (FNIGC, 2014, p.8). In the past, large numbers of First Nations people living on-reserve were excluded from major national health surveys, due to the difficulties of accessing remote communities and resistance among some First Nations people in participating in research carried out by external parties like federal agencies. Health authorities therefore lacked knowledge of basic information, such as the number of First Nations people with diabetes. The RHS sought to address this challenge through working with Health Canada and other health authorities, regional First Nations organizations and local communities to collect information about the physical, emotional, spiritual, mental, environmental, economic and social factors that determine health. Ownership, control, access, and possession of RHS data all remain with the participating First Nations. Local community members carry out fieldwork and political leaders provide consent to this process, while data is housed at the FNIGC and First Nation data centres (Bruhn, 2014).

First Nations are also building internal capacities to gain control over their data assets. This work involves various partners, who engage First Nations in each step of the research process and support First Nations ownership and control over the data generated. Partners also benefit, since the knowledge they draw on is collected, interpreted and validated in cooperation with the people and communities involved. One example of this work is the Tui'kin Partnership in Nova Scotia. Five First Nations on Cape Breton (Eskasoni, Membertou, Potlotek, Wagmatcook, and Waycobah) created a shared health data governance platform. Partners include Nova Scotia's Minister of Health, the district health authorities, First Nations and Inuit Health Branch of Health Canada, and Dalhousie University. This initiative is governed by the Unama'ki Data Access Committee. Decisions to allow use or disclosure of data require written consent from each of the First Nation representatives and the Department representative (Bruhn, 2014).

First Nations are also setting up data management platforms in local communities, often in partnership with regional community intermediary organizations. For example, the Membertou Data Centre in Nova Scotia houses community data, manages network connectivity, and provides technical support services to its First Nation members. The specifics of these activities are outlined in formal agreements with the data centre. A similar initiative is in place in Northern Ontario, where a First Nations technology organization, KO-KNET, established by the Keewatinook Okimakanak Tribal Council, set up local data centres. Each community houses its own data server, typically located in the school, while KO-KNET provides virtual backup through an off-site connection. Finally, in B.C. the Cowichan Tribes created the Mustimuhw Health Data Management System, which is now being implemented by First Nations in several other provinces, including Manitoba and Saskatchewan. This system similarly combines the efforts of member First Nations and regional intermediary organizations to manage data.

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<sup>2</sup> Read Chapter 9 here: <http://www.ethics.gc.ca/eng/policy-politique/initiatives/tcps2-eptc2/chapter9-chapitre9/>

These various data management initiatives are also informed by the e-Community strategy developed by First Nations and ratified by the Chiefs-in-Council of the AFN (Whiteduck, 2010). This strategy outlines how the federal government can support community technology development, and includes data management as a component of this process (O'Donnell, Milliken, Chong & Walmark, 2010). In the context of data management, the e-Community strategy supports the efforts of First Nations and their partners to house data, generate customized products and services, offer relevant training, support staff, provide technical support, manage partnerships and protocols, and develop common indicators for data analysis. In the remaining sections, we provide a case study of how this e-Community data management process emerged in the Mohawk community of Kahnawà:ke, positioning it as a concrete example of Indigenous resurgence. Our discussion illustrates how staff in these organizations manage and use community data, in partnership and negotiation with internal and external organizations.

### **Community-based Data Management: The Role of the First Nations Education Council**

An holistic e-Community environment of social and technical elements supports data management in Kahnawà:ke. It includes: technical architectures (infrastructure, connectivity); data management systems; governance (policies, analysis, supervision); and personnel (skills and capacities). Our interviews covered how these facets of data management are developed and used in several community organizations, including the Step-by-Step early childhood program, two elementary schools (Kateri School and Karihwanoron Mohawk Immersion School), the high school (Kahnawà:ke Survival School), a social service organization (Kahnawà:ke Shakotiia'takenhas Community Services, or KSCS), and a health organization (Onkwata'karitáhtshera). Our case study illustrates how these organizations manage and use community data, in partnership and negotiation with internal and external organizations.

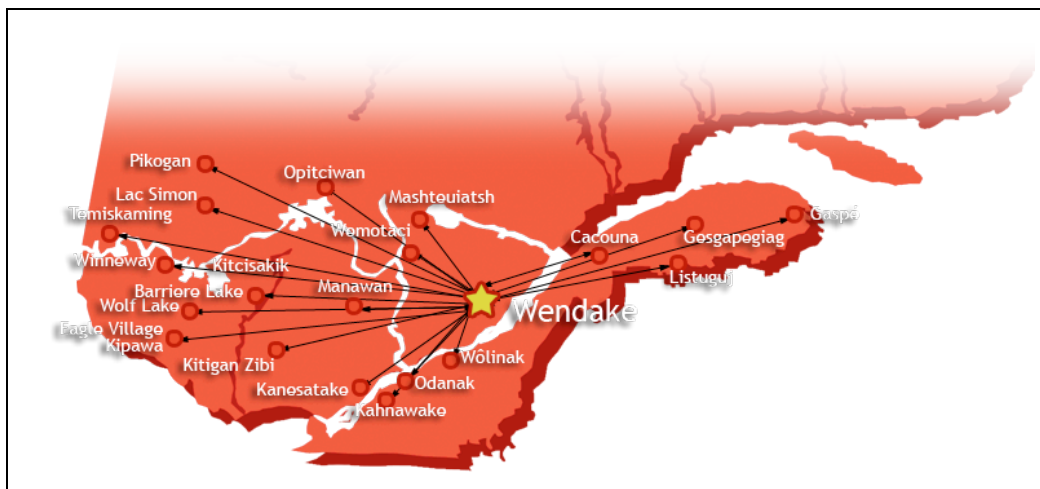
This work is guided through Kahnawà:ke's partnership with the First Nations Education Council (FNEC). Founded over two decades ago, FNEC represents 22 member communities<sup>3</sup> from eight nations in the province of Quebec: Abenaki, Algonquin, Atikamekw, Huron, Malecite, Mi'gmaq, Mohawk, and the Innus community of Mashteulash (see figure 1). FNEC provides many services to its members, including programs in special education, youth training and employment, and Aboriginal languages. It works with federal agencies and First Nations to manage funding and programs to support educational initiatives in its member schools and communities.

As a First Nation community intermediary organization, FNEC's mission is to develop, implement, and execute technology initiatives in ways that realize the needs and priorities of its members. Authority for decision-making rests with member communities, who engage FNEC to support local initiatives. FNEC is linked to the Assembly of First Nations of Quebec and Labrador, a political association comprised of all 43 First Nations Chiefs in the province. FNEC carries out mandates passed down by the Assembly's General Assembly (consisting of one education representative per member community) and the Special General Assembly (consisting of the Chiefs). This ensures that FNEC's activities are directed by its 22 member communities.

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3 Cacouna, Kipawa, Gesgapegiaq, Gespeg, Kahnawà:ke, Kanasatake, Kitcisakik, Kitigan Zibi, Lac Barriere, Lac Simon, Listuguj, Manawan, Mashteuiatsh, Odanak, Opitciwan, Pikogan, Timiskaming, Wemotaci, Wendake, Winneway, Wolf Lake, and Wôlinak.

**Figure 1: Map of FNEC member communities**



Over the years, the Chiefs of FNEC’s member First Nations have tasked the organization to undertake consultation, support, and advocacy activities encompassing various aspects of e-Community development. FNEC partners with 22 communities to provide education services to an approximate combined student enrollment of 10,000. FNEC’s technology division helps establish broadband connections distributed across public sector organizations. Key regional initiatives include deploying a network of videoconference systems and an initiative to install fibre optic infrastructure in all member communities (Whiteduck & Beaton, 2014). Both projects involve partnerships with government agencies, including AANDC, Health Canada, and the province of Quebec. The technology division also offers services including connectivity, equipment, training, web and email hosting, and technical support. Cost-effective high-speed Internet and videoconferencing services are secured through agreements that outline special rates and interconnection options with three private sector telecommunications carriers in Quebec: Bell, Telus, and Telebec. According to FNEC, these agreements – combined with public sector funding to subsidize connectivity costs - have enabled communities to reduce costs of Internet access by two-thirds and at the same time substantially increased their connection speeds. By pooling technical and financial resources and supporting economies of scale, FNEC can achieve significant cost savings for member communities.

With regards to data management, FNEC encourages its member First Nations to adopt the CANO platform, which is made available free of charge to schools that are part of AANDC’s First Nations School Success program (FNSSP). FNSSP is a funding initiative set up to support First Nations educators on-reserve to develop resources in areas of literacy, numeracy and student retention (AANDC, 2014). It provides the development and implementation of student learning assessments, performance measurement and school success plans – all of which directly correspond to data management involving both regional organizations like FNEC and their partner communities. The program set up a series of indicators and assessments, including for data collection, analysis and reporting. This work requires a school data management system, which can be an existing provincial system (modified to incorporate First Nation contexts), an

off-the-shelf product, or a customized version of a product already used by a First Nation. In the context of FNEC, First Nations member communities utilize a customized system called CANO.

Data and information management protocols and practices associated with CANO follow OCAP principles. The system supports integration with education service providers and other stakeholders, including requirements to share data with external organizations like government agencies. FNEC provides a number of resources associated with this work, including: information on managing school information and data; policies outlining data management responsibilities and requirements; and forms to guide the formation of privacy and confidentiality standards. CANO also supports local customization to meet the needs of diverse communities. Personal and confidential information is secured on servers hosted by FNEC.

Implementation of CANO includes training for staff in communities who manage data collection and use at the local level. In schools, staff can use this data to measure student achievement and progress. This can help enhance educational services, student learning and efficiency. It also allows teachers and administrators to save time on tasks like tracking attendance, calculating grades, writing report records, searching for student information, and support behavioral plans. Administrators use CANO to manage finance, budgets, human resources, and other areas.

As the CANO system is rolled out in more of its member communities, FNEC is working to streamline its implementation. As one of the first communities to utilize the system, Kahnawà:ke provides valuable lessons to inform this work. FNEC's member communities are at different levels of data management capacity, and so the regional organization is working with them to assess readiness and assist with transitioning to the system. In the following sections, we outline some of the elements that educational organizations in Kahnawà:ke put in place to support their use of CANO. We draw on our interview data to illustrate best practices, implementation considerations, and challenges.

### ***Kahnawà:ke's Technical Architecture for Community Data Management***

Adequate digital infrastructure and connectivity is key to supporting community data management. This technical infrastructure must be secure, scalable, customizable, and interoperable. Once in place, it supports data transfer both inside and outside a community, and allows system users to access various applications, including data management tools such as CANO. A technical infrastructure includes physical networks, connectivity, devices, and software/applications. In this section, we describe how Kahnawà:ke secured ownership and control over its physical networks and facilities, with the result that community organizations are now leveraging them for various broadband-enabled applications, including for digital data management.

In the late 1990s, a local company called Paul Communications (in partnership with VideoTron) installed cable infrastructure to network Kahnawà:ke. At that time Bell Canada only offered dial-up services. In the early 2000s Paul Communications ended its partnership with Videotron and established an independent privately-owned ISP/cable company, which has since grown to 1,600 customers and provides cable broadband (residential speeds are 6MB down / 1MB up;



Commercial speeds are 10MB symmetrical). Bell Canada continues to provide DSL services. The infrastructure established by Paul Communications was used to interconnect community organizations over a secure network called *Tewatati*. This system improved when the Mohawk Council gained compensation from Bell Canada, due to a lack of payment for rights-of-way access used by the company for its fibre optic network. To make up for years of back pay, the Council opted to gain access to Bell's fibre infrastructure through an agreement to connect every community building via fibre optic cables through a 25-year free lease. As a result, *Tewatati* networked several community organizations over a 5MB connection, including the three schools, emergency services (firehall and police station), hospital, economic development organization, and Mohawk Council.

Inside Kahnawà:ke's education sector, *Tewatati* greatly improved connectivity in the three schools and administrative offices of the Kahanwake Education Centre. Prior to the project, in 2003 KEC connected four sites via cable, which only provided limited connectivity. Although every classroom had at least one computer, there was no interconnectivity or file-sharing: the system was mainly used for Internet access. However, by 2004-2005 KEC upgraded its network (alongside construction of the new schools) and interconnected its buildings through a VPN that ran on the *Tewatati* network. Around this time, KEC began working more closely with FNEC, which assisted with software licensing, Smart Board diffusion, and network design. In 2006, FNEC installed a T1 connection at one of KEC's sites. After that project concluded, KEC and FNEC applied to AANDC's First Nations Infrastructure Fund to upgrade *Tewatati*. In September 2012, the partners used these funds to install a 100MB feed in Kahnawà:ke (which remains fully owned by the community and managed by FNEC) and physically interconnected the schools. Today, they have full Wi-Fi coverage.

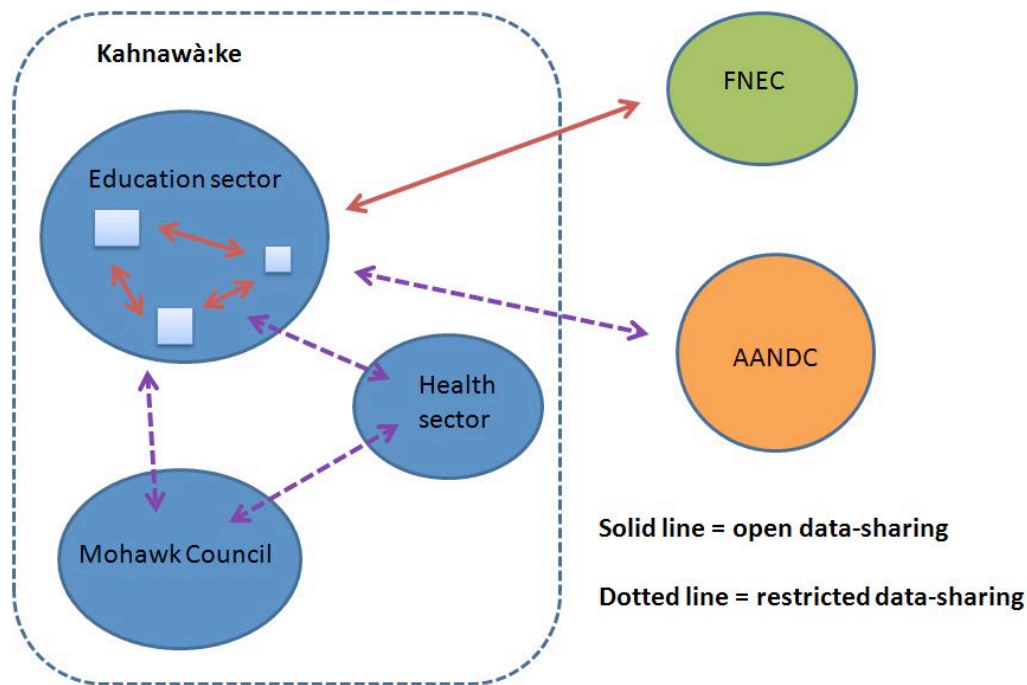
As of 2014, this infrastructure has expanded throughout the community. The improved *Tewatati* network interconnects all public sector organizations. Secure networks separate data traffic from different organizations, which manage their own firewalls and security protocols. Nightly backups ensure that data is kept secure. Local service providers use the community network for various applications, including file-sharing, videoconferencing (since 2003) and Smart Boards (since 2005). KEC is now looking to develop a Voice-over-IP telephone network between the schools and administrative offices, given that most voice traffic in the community is between local organizations. The organization also acts as an Internet service provider for other community organizations, which generates revenues to support technical services and expansion.

Now that community organizations in Kahnawà:ke are interconnected through the *Tewatati* infrastructure, network managers are working to better integrate them in a single shared network. Along with lowering connectivity costs, such a system could result in cost-savings for applications like email services and software. Upgrades to *Tewatati* also continue: for example, Kahnawà:ke Shakotiiia'takenhas Community Services (KSCS) will soon install a fibre network that will interconnect its five buildings with other community services.

### ***Data Governance in Kahnawà:ke (Policies and Processes)***

The technical infrastructure discussed above is a key enabling factor for community data management. However, its effective use is contingent on a corresponding social infrastructure that outlines the rights and responsibilities of various stakeholders. This includes the development and application of standards, data-sharing agreements, and privacy and security policies (FNIGC, 2014). Such arrangements outline roles, responsibilities, and accountabilities, and clarify details on planning, delivery, and evaluation of communication data (Bruhn, 2014). They address the balance between local control and a regional or ‘community aggregate’ approach that shares data to leverage economies of scale. Understandably, concerns can sometimes arise over these agreements, which involve many considerations around OCAP principles. In this section, we describe three forms of data governance in Kahnawà:ke: among organizations in the educational sector; between different community organizations in Kahnawà:ke; and between Kahnawà:ke educational organizations and external organizations (specifically government agencies). Figure 2 provides a conceptual model of this data management process.

**Figure 2: Data Management in Kahnawà:ke**



### Data Management Inside Kahnawà:ke’s Educational Sector

As noted above, education organizations in Kahnawà:ke interconnect through a technical infrastructure used to transfer data among the three community schools and the KEC administrative offices. For example, starting in 2013 the elementary and high schools began using CANO to support the transfer of student files and records between community schools. KEC supports this work through an on-staff registrar. This work is done in partnership with FNEC, which acts as a regional data steward and support organization. KEC and FNEC

developed and use formal policies as guidelines for staff with regards to data management processes.

This work is supported through and encoded in the technical design of the CANO system. In the early 2000s, KEC used a data management system written by an in-house programmer to track financial, student, and post-secondary data. Although KEC still uses this system for post-secondary files, finance was taken off in 2012, and student records and administration shifted, first to Dadavan, and then to CANO. Dadavan is a data management system used across Canada by First Nations schools that belong to AANDC's First Nations School Success Program (FNSSP), described earlier. KEC began using a version of Dadavan in 2009, to support K-12 grading and attendance for all schools. After a couple of years, KEC moved over to CANO, a version of Dadavan customized by FNEC to meet the contexts of First Nations in that province.<sup>4</sup> CANO supports local customization by enabling school staff and administrators to add applications to manage data in areas like finance, budgets, and human resources. During our interviews with staff in Kahnawake's educational sector, everyone involved felt that the CANO system met their needs. However, some people also pointed out challenges regarding its reliability at certain times. For example, several noted that during report card times, when many people are using the system simultaneously, it is unstable and prone to crash. Others noted that attendance does not always work properly.

The shift to CANO did not result in any major changes to KEC's technical back-end, but did create a more user-friendly, customized interface for staff. It also adjusted where data is located: in the past, data was stored locally at KEC but with CANO it is housed remotely at FNEC. When asked whether there are any concerns over local data ownership and control in this arrangement, interview participants felt confident in CANO and expressed trust that data housed with FNEC is secure and managed properly. That said, not everyone interviewed was aware where data was stored.

Most interview participants also stressed the importance of privacy and confidentiality with regards to the data they work with. This was particularly the case with student data, especially for students with special needs. One way that privacy and confidentiality is maintained in CANO is through the way that FNEC and KEC manage user roles and access to data. While some participants noted glitches (such as not being able to access required information, or being able to access more information than is needed) most people expressed satisfaction with this arrangement.

### **Sharing Data Between Different Community Organizations in Kahnawà:ke**

While data-sharing inside Kahnawà:ke's educational institutions (schools and KEC) is relatively open, the process is more controlled with regards to these organizations sharing educational data

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<sup>4</sup> Other community services in Kahnawà:ke utilize different data governance applications. For example, Step-by-Step uses several databases, including some created on Access and Excel, to track their 160 students. This resulted in duplication of efforts and data – with the result that they are presently considering migrating to CANO. The Social Services group (KSCS) has used its data governance system for close to 17 years. They are presently conducting an analysis of data needs, to determine if an updated system is needed.

with the broader community. This is partly due to a perception among staff that some community members are critical of Kahnawà:ke's educational system. Several interview participants noted that in the past, the schools were very popular – but in recent years this has declined, and many community members now send their children to attend schools in Montreal. Some staff believe this is due to a lack of information and public awareness about school programs and successes. One person stated: “we have the greatest schools and no one knows it” (K22). This perception has led to a protective stance among community education staff regarding data-sharing with community members in general; in one person's words:

“Our own community is our own worst enemy... So we're very protective of everything all the time... [Data] only stays with us. I wouldn't want that information at council, community services, anywhere. That information has to stay within education” (K22).

Other research has revealed similar tensions regarding data-sharing among community organizations working in different sectors. Bruhn (2014) interviewed a number of data management professionals working in regional First Nations organizations and government agencies like Health Canada and AANDC. These people told her that there is a need to integrate disparate data sources – now dispersed in siloed programs and jurisdictions – around individual First Nation citizens in a more holistic way (p.10). This is a similar approach as that outlined in the e-Community strategy, which proposes a cross-sectoral approach to community data management, and technology development more generally (Whiteduck, 2010).

Several interview participants in Kahnawà:ke expressed their support of this kind of holistic data-sharing among community organizations. However, they also recognize the siloed nature in place. Community services are Band council programs but administered independently. They also manage data independently and do not generally engage in data-sharing. Several people felt that sharing data among these organizations would require a major administrative shift. For example, at present Step-by-Step's databases are neither technically nor socially integrated with the CANO system used in local elementary schools, which raises challenges for students transitioning after early childhood education. In one person's words: “In theory, we are all supposed to share and be open about what we have. We're all part of this group. But in practice, we're kind of protective to a certain extent” (K11). Local politics are also a challenge, particularly in small, tight-knit communities like Kahnawà:ke. At the same time, some people said they “absolutely” share data with other community organizations, through a blend of formal protocols and informal relationships. However, several interview participants noted that the process has not been easy. In one person's words:

“[I]t's taken a lot time for anyone to be able to give up any information that they've had. Especially when it comes to community services... But I think that over the years all of the organizations are starting to realize that they need to work together in order to have, you know, productive, healthy community members” (K13).

Trust-building as well as frequent contact among parties can help address this issue (Bruhn, 2014). In Kahnawà:ke, several community organizations established a formal mechanism to do this in the 1990s, through the *Quality Improvement Accountability Framework*. This *Framework*

led to the creation of the Executive Directors' Committee (EDC), composed of the executive directors of the nine major community service organizations. Although two organizations (including KEC) are no longer part of the EDC group, it continues to meet on a monthly basis to discuss common issues, such as gaps and overlaps in service delivery, and to streamline and pool resources and secure cost savings. The EDC develops MOUs outlining roles and responsibilities to guide how different community organizations work together. It is moving towards establishing common data-sharing protocols.

### **Sharing Data with External Organizations**

Kahnawà:ke community organizations also share data with external entities like federal government agencies. Bruhn (2014) notes that program and service delivery depends on productive partnerships between federal agencies and communities (p.16). In the case of Kahnawà:ke, FNEC acts as an intermediary between community organizations and government agencies like AANDC. It does not share any Kahnawà:ke data directly with external government agencies (or other groups). To ensure that this process does not undermine community control over data, FNEC developed an information system management policy that includes guidelines around the creation, development, access and delivery, monitoring and measurement of community educational data.

To implement this policy in its reporting to AANDC, the federal agency responsible for administering education funding for First Nations, FNEC staff work with a KEC staff member designated as the FNSSP Coordinator. This individual creates a report generated from community data, which is then sent to AANDC via FNEC. This work is guided by a protocol established by FNEC called the *FNEC Program and Submission Report Deadlines for Communities*. Data is entered into the CANO system from various collection points in the school system. This data is collected at the school level and organized according to classifications hard-coded in the CANO system by KEC, in partnership with FNEC and government partners. Schools then use CANO to generate reports from this data according to requirements set by government funding agencies. These reports are collated by the FNSSP Coordinator and filed according to a set of protocols established by FNEC and KEC. Every month the FNSSP coordinator meets with a group of around 10 administrators, resource teachers, and teachers from all grade levels to discuss these reports, go over the school success plan, and identify any additional resources that may be needed. Finally, the reports are sent to FNEC, which then transmits them to AANDC.

Trust is a clear challenge with regards to community organizations sharing their data with external organizations. Bruhn (2014) cites the 1996 *Report of the Royal Commission on Aboriginal Peoples*, which notes that “data gathering has frequently been imposed by outside authorities, [and so] it has met with resistance in many quarters” (p. 4). Several interview participants expressed concerns that community data can be used by external organizations in ways that lack context or are detrimental to their needs (K10). A clear example of a trust challenge regarding community data in Kahnawà:ke is the potential impacts of the proposed *First Nations Education Act* (FNEA). Many people in Kahnawà:ke strongly resisted the *Act*, as evidenced in public demonstrations and opposition letters written by local leadership to the

federal government. (That said, not everyone is against the *Act* and interview participants noted that some people in the community support it). No-one interviewed was in support of the *Act*, although some people were more specific in their criticisms than others.

Some people see the *Act* as a means for external organizations to increase their access to community educational data. In one person's words: "with all the FNEA stuff that's going on, to me it's a concern if it's [data is] going directly into the hands of government or someone else that we don't know" (K21). Others felt that the *Act* might undermine community control over education, and undermine its ability to manage the schools and educational system. Some felt it would impact funding and budgets, which limits the ability of community organizations to plan and manage their resources. Others felt it would increase monitoring. For example, one person noted that the *Act* would require the community to hire a school inspector, and if they did not reach their FNSSP goals, the government could appoint a third-party manager. Another concern was the lack of provisions for culture and education in the *Act*, which some felt might affect the viability of the Mohawk Immersion School. A related concern was about the potential impact of the *Act* on staffing, since teachers at the Immersion School are sometimes hired for their Mohawk language abilities, rather than for their formal provincial accreditation. These concerns were also held by people in organizations not directly affected, such as Step-by-Step. As a feeder system for schools in Kahnawà:ke, staff at this organization remained concerned about issues around the professional accreditation of teachers, post-secondary funding, and culture and language support. In one person's words:

"I think the *Education Act* is looking at data. Looking at data, at some communities that are poor. I think that's the way government is using data to say look these schools are inadequate. And because of that, the kids going to school, we need to demolish the schools in the community and they need to go to the mainstream schools. Using data for the wrong reasons. Instead of looking at data and saying look how can we use the data in the schools to improve the situation that you're in" (K5).

Given these challenges, community data management is seen as a tool to support Kahnawà:ke's position vis-à-vis external evaluations. For example, CANO enables community organizations to make 'evidence-based' arguments on issues such as accountability, reporting and funding proposals. By collecting and analyzing their own data, and then presenting a report to AANDC, community organizations have more control over their data. In one person's words:

"I think the fact that we have so much data through CANO is going to be to our benefit, because we can show that we have a successful educational system here. And we have the data to prove it. So I think that will be a testament to our success" (K4).

As a final point, staff in Kahnawà:ke organizations are interested in sharing data with other First Nations. Several community organizations already have staff that belong to provincial or regional associations that meet periodically to discuss technical issue and share knowledge and resources. This helps staff learn what other communities are doing, see what resources and support regional intermediaries like FNEC are providing, and share information about funding opportunities. Some felt that CANO might benefit from a section where schools in different First

Nations can share resources, such as school success plans. FNEC supports this work through organizing workshops and conferences, and providing webinars and remote connections over Skype or videoconferencing.

### ***Data Management Capacities***

Finally, community data management includes the roles, responsibilities and accountabilities of staff. Data can be used to design, plan, and manage First Nations government functions and operations. Data can show how political, demographic, social and economic changes affect communities, consolidating information from multiple existing sources to introduce efficiencies, reduce reporting burdens and improve compliance.

While the goal of this work is local data management by First Nations, communities are at different levels of readiness and capacity in terms of their abilities to undertake it. Overwhelmingly, interview participants in Kahnawà:ke identified the need for designated staff to support community data management and provide on-site technical support. KEC has a systems administrator who manages networks and services for all three community schools, and another who is a resource for CANO. This IT team is extremely busy given they provide support for the different schools in the community. Several interview participants noted that dedicated staffing is a challenge, given the size of the community and the amount of data used by local organizations.

IT Staff support is supplemented by training and workshops to general staff, which are provided by request and through scheduled training events run both by in-house staff (KEC) and FNEC. Teachers and other staff are trained as CANO ‘gurus’ or champions. Those who had not received formal training on the system requested it, and several pointed to the necessity of some level of data management literacy. Training can help staff use CANO to more effectively manage day-to-day operations inside schools. For example, it helps report cards, track attendance, manage class lists and detention reports, register students for post-secondary programs, place students in classes, based on their level of proficiency, and manage Individual Education Plans. One example of how CANO supports student success is from the Mohawk immersion program, which begins at nursery school level and concludes at the end of grade four. When students leave grade four, they are screened to see their readiness for the English program – that information is entered into CANO along with their results. Often they require additional resources in grade five and grade six to bring their English skills up to grade level. Interview participants from KSS noted: “There’s a percentage of students reading at a certain level, students coming into the school from immersion. So they’re coming in at a lower level of reading... What we’ve seen so far is that the students coming from full immersion are the one where that are proceeding more with reading, to catch up” (K1).

Data management training is also seen as useful for school administrators. CANO can be used for administrative purposes, like setting up meetings, organizing emails, and to manage finances, such as purchasing for the school. It can also track staff and is used by KEC to allocate staffing resources. It supports strategic planning, allowing administrators to distribute resources and funds to various service areas according to evidence-based planning. Training in these areas could enable administrators to use the system to its full potential.

## **Conclusion**

In this paper we traced how the Mohawk community of Kahnawà:ke is building an enabling environment to leverage its data resources to support self-government in the educational sector. We described how technical infrastructure, social relationships, policies and procedures, and human resource capacities combine to support community data management. We outlined the roles that local organizations, regional support institutions and government agencies play in this process. We also described some of the tensions and challenges embedded in this work, as well as some of the successes achieved.

We position Kahnawà:ke's data management work as a clear example of Indigenous resurgence, as described by Corntassel (2012), Simpson (2011), Alfred (2009) and others. Faced with a challenging situation rooted in the long-term and ongoing impacts of settler colonialism, Indigenous educators in Kahnawà:ke are engaged in the difficult work of re-building their educational system. Data management and informational resources provide important tools to support this work – if they are adequately owned, controlled, accessed and possessed by community-based organizations. In the coming years, efforts to build and develop data management systems and capacities will be key to these efforts – particularly as more aspects of our societies move online.

The hard work of people in Kahnawà:ke shows us how individuals and groups are taking ownership and control of this process in an incremental but steadily growing manner. It demonstrates that this is not an easy task, but rather one that faces many tensions and setbacks. It is these kinds of activities – in the decolonization processes that many First Nations people are engaged in every day – that illustrate the key lessons we learned during our research. We hope that this presentation is of use to other communities engaging in similar efforts from their own, diverse and locally rooted contexts.

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