



HARNESSING ICTS: A CANADIAN FIRST NATIONS EXPERIENCE

INTRODUCTION TO K-NET

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INTRODUCTION TO K-NET

BACKGROUND

This is a collection of case studies focusing on K-Net, an aboriginal network that is providing broadband connectivity to First Nations communities in the remote regions of northwestern Ontario, Canada. The network is formally known as the Kuh-ke-nah Network of Smart First Nations. Kuh-ke-nah is an Oji-Cree expression for "everybody" and that is the goal of this network – it is for everybody.

This collection of case studies describes the development of the K-Net network and explores how community members harness information and communication technologies (ICTs) to improve local health,



education, and economic development. Based on first-hand accounts and using a sustainable livelihoods framework, the case studies attempt to capture some of the real impacts that the introduction of K-Net's technical infrastructure and services have had on people's everyday lives.

This series is directed at both Canadian and international audiences interested in how the K-Net experience has evolved. In particular, readers from indigenous communities in Latin America and the Caribbean may find important lessons to inform their efforts to harness ICTs. The authors of these case studies have become very familiar with the work of K-Net and have learned a great deal. Our hope is that we are able to capture the lessons that are applicable elsewhere – what we refer to as "principles that travel."

This case study series is entitled *Harnessing ICTs*. Information and communication technologies are powerful vehicles that can be controlled and directed by indigenous communities to help them arrive at their own goals. Finding a healthy balance in the use and development of these communication tools is the challenge that the people of the KO region have undertaken, as we have seen while trying to capture on video a wide range of personal stories from the K-Net communities (see <http://www.knet.ca> for the full multi-media report with video clips). The K-Net network is a tool: it only provides options that the people must decide how to use. These technologies challenge individuals, communities, leaders, regional organizations and partners to find positive applications and opportunities for all citizens. The question of balance is important for aboriginal people and belongs in



K-Net is a program of the Keewaytinook Okimakanak (Northern Chiefs) tribal council. The communities in focus are linguistically and culturally either Cree, Ojibway or Oji-Cree. Together they form the Keewaytinook Okimakanak (KO) tribal council (Northern Chiefs). KO is part of the Nishnawbe Aski Nation (NAN), a regional organization representing the political, social, and economic interests of 49 First Nations in northern Ontario, across an area roughly the size of France. NAN includes a population of approximately 25,000. The majority of this population is aboriginal and lives in remote communities with 300-900 inhabitants. For many communities, the only year-round access into or out of their area is by small airplane, though most have winter road access for five or six weeks during the winter season.



all their teachings. These are stories about how people embrace change with modern tools while also balancing this change with the traditions and ways taught by their elders. This story is just a beginning.

"...the political leadership in Keewatinook Okimakanak has identified telecommunications improvements as a self-determining means for achieving community wellness and development."¹



NORTHERN ONTARIO FIRST NATIONS: A WORLD APART

In the context of northwestern Ontario, the word rural has no meaning and must be replaced by "remote". For any remote First Nations community, information and communication technologies provide an opportunity in terms of maintaining and protecting culture. This dilemma is part of the history of media development in northern Canada. K-Net faces challenges that have no parallel in southern Canada with regard to attracting basic infrastructure investments.

The fact that some of the northern communities have received access to the Internet via satellite without first having access to telephones is indicative of the scope of the challenges. Infrastructure expansion in the North does not happen through market forces; regulatory and governmental incentive mechanisms are necessary to provide universal access for people in these communities. While Canada boasts some of the world's highest indexes of well-being and telecommunication access, communities in the North have not equally benefited from these achievements.

AN ABORIGINAL NETWORK

K-Net is an organization that has taken on the challenge of living in 'two worlds' – maintaining and protecting First Nations culture for future generations, while harnessing state-of-the-art communication and information technologies.

K-Net is a regional information technology and content development organization that supports and manages various local First Nations telecommunication initiatives across this vast and remote region. It connects these northern communities with each other and the world by delivering a variety of broadband services and promoting the development of local electronic indigenous applications.²

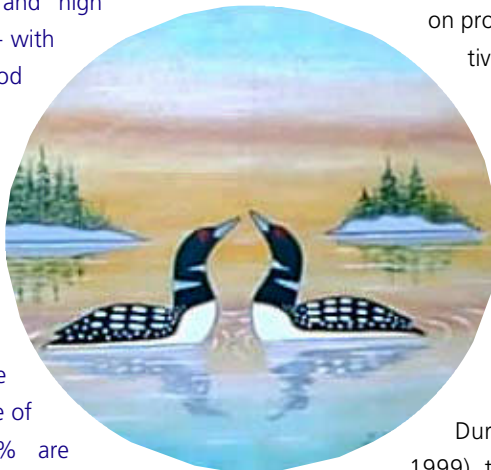
Approximately 2,800 people live in the Keewatinook Okimakanak communities. Deer Lake is the largest community with a total population of 850. There are 314 people living in North Spirit Lake, 316 in Poplar Hill, 470 in the community of Fort Severn, and 539 in Keewatin. The territory where K-Net began is about 200,000 km² in size, with approximately 20,000 people from 23 First Nations north of Sioux Lookout (0.1 persons/square kilometre).

1 Hoshizaki, E. (1999). *Keewatinook Okimakanak Broadband Network Study*. Unpublished report prepared for K-Net Services, Sioux Lookout.
2 Beaton, B., & Fidler, J. (1999, 13-16 October, 1999). *Living Smart in Two Worlds: Maintaining and Protecting First Nation Culture for Future Generations*. Local Knowledge / Global Challenge: Smart Community Development. Summerside, Prince Edward Island, Canada.



The following describes the KO communities in brief:

Keewaytinook Okimakanak First Nations are members of Nishnawbe Aski Nation (NAN). They are small, remote, fly-in communities that have struggled for decades with the practical consequences of institutionalized isolation. Hospital and high school access require air travel – with the exception of a 10-week period when 4x4 vehicles can travel along a winter road. Most homes are within walking distance of local services such as education, health and administration buildings. Communities share demographic characteristics. Almost 25% of the total population is under the age of 10 years. An additional 25% are between the ages of 10 and 19 years of age. Fewer than four percent of the total population is age 60 or older. Approximately 36% of the adult population are unemployed or are receiving some form of social assistance. High school completion rates are low, particularly for those 45 years of age or older. All of the communities are located in resource rich areas. Forestry and mining activities are rapidly expanding into traditional territories and tourism is a seasonal mainstay for the area.³



This foundation work created the institutional framework for K-Net: between 1994 and 1995, the KO Northern Chiefs' council began mobilizing local and federal funding to establish an electronic bulletin board service, offer training, and acquire computers for each KO First Nation.

From the very start, the K-Net organization focused on providing telecommunications connectivity (bandwidth), training, promoting awareness, and, perhaps most importantly, linking the technological demands of the KO communities with various programs offered by telecommunication providers, regulators, academia, funding agencies, and vendors across Canada.

During its expansion phase (1996-1999), the organization began offering a wider range of services and added Internet service provision to KO communities and beyond. This included: providing advice on equipment and configuring it to work in network environments; lobbying efforts and work to establish bandwidth services (narrowband with MSAT/DirecPC solutions, and broadband through a Bell Canada infrastructure upgrade); using Linux open-source software to build routers that can be managed remotely, and including dial-up services for local configurations. In addition, it is worth noting that K-Net is a regional information technology and content development organization. Thus, it serves as a technical service provider, an application provider and a content provider.

A BRIEF HISTORY

Since the early 1970s, many communities, organizations and programs (First Nations of Nishnawbe Aski, Wawatay Native Communications Society, Ontario Network Infrastructure Program) have contributed to the introduction of basic telecommunications infrastructure in the region (two microwave networks and several satellite solutions). During that time, Wawatay was established and became active with media projects across the North, including the Northern Pilot Project High Frequency Radio network which served 25 communities.^{4,5}



3 Keewaytinook Okimakanak Northern Chief Council. (1999). *The Kuh-ke-nah Network of Smart First Nations* [grant application]. Sioux Lookout, Ontario: K-Net. p. 5

4 Hudson, H. (1974). *Community Communication and Development: A Canadian case study*. Ph.D. dissertation. Palo Alto, California: Stanford University.

5 Also see: <http://www.wawatay.on.ca>



K-Net and its partner organizations have also dedicated efforts to political lobbying, not only on behalf of KO communities, but also throughout many Nishnawbe Aski Nations communities across northern Ontario. K-Net has played an important role in shaping regulatory decisions of the Canadian Radio-television and Telecommunications Commission (CRTC) that determine the services that are made available to rural and remote communities.

The CRTC is the independent Canadian telecommunications regulator. The 1999 High Cost Serving Area ruling established the requirements for telephone connectivity that all private telecommunication operators must meet in order to hold a license. Wawatay Native Communications Society and subsequently K-Net participated actively in the CRTC's High Cost Serving Area hearings. Their inputs influenced the final ruling that established that 'basic telephone services' for high-cost-service areas would be defined as follows:

- ▲ Single-line touch-tone service with local access to the Internet;
- ▲ Access to enhanced calling features, including 911, voice message relay service for those with hearing difficulties, and features that protect privacy;
- ▲ Access operator and directory assistance services;
- ▲ Access to long distance; and
- ▲ A copy of the current local telephone directory.

This ruling gave Canadian telecom companies until 2003 to provide basic service delivery. The above meant that a resident of a rural community with only party-line phones would now be entitled to have digital touch-tone phone service – the same services available to city residents. Rural and remote telephone subscribers would now be able to connect a fax and answering machine to their phone, something which party-line telephone technology did not allow. However, if these subscribers wished to get access to the Internet, their speed of access would be limited to a PC modem that could not surpass phone line speeds of 56 Kbps. This meant that high-speed modems, such as cable modems and digital subscriber line services (DSL) now available in larger cities in Ontario, were not considered a basic service option.

Two issues are significant here:

- 1 K-Net was involved in shaping a federal policy that made it mandatory for telecommunications operators to improve services – many of which simply did not exist prior to this ruling, and
- 2 during that same period (1997 to 2000), K-Net succeeded not only in leveraging resources from the Federal Economic Development Initiative for Northern Ontario (FedNor) to get some of the KO communities connected to phones (some for the first time), but on the basis of that platform, K-Net jumped ahead to broadband, providing connectivity far beyond these new 'basic' CRTC requirements.



K-Net achieved these significant impacts because of a vision: the network's organizers understood that the educational, health, and economic development needs of the most remote communities in Ontario required broadband service – they could not be satisfied strictly with what regulators and commercial carriers had agreed to build.

This cumulative experience led K-Net to compete for Industry Canada's Smart Communities Initiative, a national competition for a CAD \$5 million grant that had to be matched with an additional \$5 million from other sources. K-Net succeeded and was selected in April 2000 as the only Aboriginal Smart Community Demonstration Project for all of Canada. Among the requirements of this program, two elements stand out as major challenges – a demonstration of community engagement, and a demonstration of "smart results."^{6,7} In other words, Industry Canada wanted to ensure that the services were developed **with** the communities, not *for* them, and that the impact was documented for others to learn from the demonstrations.

6 Government of Canada. (1998). *Smart Communities: Report of the Panel on Smart Communities*. Ottawa: Industry Canada.

7 Keewaytinook Okimakanak Northern Chief Council. (1999). *The Kuh-ke-nah Network of Smart First Nations* [grant application]. Sioux Lookout, Ontario: K-Net.



The summary below describes, in a very general manner, five stages in the evolution of the K-Net telecommunications investments:

1975 - 1994

foundation work towards basic telephony infrastructure development

1994 - 1995

establishment of K-Net within KO as a specialized service

1996 - 1999

major expansion in roles and services, multiple funding in parallel

1999 - 2003

beyond infrastructure to harnessing ICTs and documenting results

2003 - ...

developing a business case to maintain the network and services

Industry Canada has been a strategic partner throughout K-Net's history. The chart below documents the funding agencies that have supported K-Net over the past few years, in order of significant investments.

MAJOR FUNDING SOURCES FOR K-NET

Federal Economic Development Initiative in Northern Ontario (FedNor) – Industry Canada (since 1998)

SMART Communities – Industry Canada (2001-2004)

SchoolNet – Industry Canada (since 1996)

Indian and Northern Affairs Canada – INAC (1995)

Community Access Program (CAP) – Industry Canada (since 1996)

Office of Learning Technology, Human Resources Development Canada (since 1999)

CHANGE THAT SUPPORTS COMMUNITIES

The connectivity that K-Net has made possible is strengthening links among people, and between communities and the outside world; it is reducing a sense of isolation and separation for remote communities. This experience:

- ▲ supports community members who have left the community because of sickness, schooling, or work to keep in touch with their community and know what's happening (videoconferencing, homepages with local news, photos)
- ▲ makes it easier for those who have left to return (more access to information and the "outside world", less "boring" and isolating)
- ▲ supports members within the community to keep in touch with family members, children who are away at school
- ▲ supports people to stay in the community longer and still have their needs met (e.g. people needing medical or psychological treatment, children receiving more time to mature before going away to school)
- ▲ provides opportunities for community members to see what's going on in other areas (in the North or further) and offers ideas for new things they'd like to promote in their own lives

Community members are recognizing and using the K-Net network as a tool that offers both benefits and challenges for their local and cultural issues, including education, health, and economic development. Local people have been directing the implementation and application of the network since its beginning, and this needs to continue if the tool is to be applied to its full potential by the communities.





HEALTH

The K-Net services that provide telehealth and telepsychiatry are giving people in KO communities new choices. A pilot project has demonstrated that one-quarter of all medical consultations can be carried out effectively using telemedicine. This makes it easier, especially for elders, to get quality medical care without the discomfort and high expense of flying out of the community.⁸ The telediagnos- tics facilities also make it easier for care providers to provide services: local health workers have access to information sources, nurses can get specialized advice immediately, and doctors are finding the technology to be a useful support rather than a replacement for their services.



⁸ A typical round-trip flight from Fort Severn to receive medical services in Thunder Bay costs over CAD \$1,000.

⁹ For example, the e-Centre in North Spirit Lake has 5 public access computers with broadband service, located in an "overnight" cabin used by Health Canada staff and other community visitors. North Spirit's e-Centre boasts the community access site, a videoconferencing suite, a staff office and a fledgling library begun with book donations from the local school. Four staff work with the community to help people make use of the available technologies and also work to keep the entire network running throughout the community and in the different buildings. The e-Centre is the community data network hub providing direct access services to all the services available on the high-speed data network.

EDUCATION

By improving access to ICTs, K-Net is having significant impacts on the education of remote First Nations communities. Until recently, in order to continue their education after Grade 8, KO children were forced to leave their families and communities to attend secondary school hundreds of kilometres away. For many young people, this involved major culture shock and a loss of social support, and often resulted in students quitting school. Now, youth have the choice of staying in their community longer to attend Grades 9 and 10 online using the Keewaytinook Internet High school (KiHS). Thanks to programs like SchoolNet, the children are quickly learning new skills and sharing this information with their elders.

K-Net's technologies allow people of all ages in KO communities to participate in government programs, university courses, and online education in a more equitable and timely manner. Community members are actively harnessing the information and communication tools available to them, feeling empowered to both influence and be influenced by what they are learning on the Internet, in chat rooms, and at their local e-Centre.⁹ They are educating themselves while also sharing their cultural heritage and traditions with a global community. Young people are staying in their communities longer while learning powerful communication skills. K-Net is leveling the playing field so that KO community members can also participate in the Information Age.



ECONOMIC DEVELOPMENT

The technology is changing the way people communicate, access information and link to the outside world. Web portals allow each remote community to connect with a wealth of resources and people from around the world. New skills and jobs have been created at public access e-Centres in each community¹⁰ to support and maintain the network, and provide services to different customers in the community. The technology allows a global audience to access the communities: local handicrafts and eco-tourism potential are now more readily available. Most significantly, the new generation is acquiring a computer literacy level that is on par with kids in any urban centre in Canada, giving them a new image of themselves and a new platform to reinvent their society. It is all about balance for aboriginal youth: celebrating their culture while harnessing the tools of tomorrow.

NETWORK DEVELOPMENT

The above services and opportunities are possible thanks to a sophisticated technological network that K-Net has built from the ground up. The K-Net broadband network provides support for band office programs, health and education services in each participating First Nation. The network supports the development of online applications that combine video, voice and data services requiring broadband and high-speed connectivity solutions. The long-term objective is to establish a wide-area network of local community networks linked across the country to other networks that share and distribute broadband services and programs benefiting local communities.

What K-Net has accomplished in less than a decade in terms of network and technical infrastructure development is incredible: communities have gone from one phone for 400 people four years ago to accessing broadband services from individual homes. There are few rural communities in Canada – and particularly few remote ones – that have experienced such a dramatic transformation. For groups wishing to replicate K-Net's work, the main message is this: pay close attention to the *process*. The technology and network infrastructure have grown from a vision and are the result of the community's unique needs and demands. The technology is directed by and for the community.

BALANCE

Information and communication technologies are notorious for increasing gaps within some environments, be they economic (digital divides) or social (such as generation or gender gaps). In aboriginal communities in particular, the introduction of these technologies has profound consequences for people's everyday lives. For the elders, the change is sometimes difficult to comprehend; for the young, it is taken for granted, and for everyone, the challenge is always to find that balance which ensures that everyone benefits. These technologies offer opportunities to strengthen and protect cultural heritage. The video material that accompanies these case studies includes statements by community leaders saying:

- ▲ "We can't go back to the old ways."
- ▲ "This must come to pass."
- ▲ "People have to be more vocal in how they want to use this technology and the decision-makers need to respond."

The technology is a tool offering new power and paths, but it is the people, especially the younger generations, who will harness it and put it to work to find meaning for their own cultures. This technology brings the world to remote areas, with the risk of making everyone seem the same, but it also holds promise by allowing cultures with unique identities to celebrate their legacy and renew it. These case studies tell a story that is just beginning.



Art work contained in these publications is copyrighted. For further information, please contact the artist: Abe Kakepetum, 16 Second Ave. N, Sioux Lookout, Ontario, Canada P8T 1H1 Telephone: 807-737-1420 <http://arts.knet.ca/artists/abe/info.html>

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Artists:

The six First Nation artists kindly agreed to support the use of their copyrighted art work to be included in this publication. They include Kevin Belmore, Derek Harper, Abe Kakepetum, Tim Tait, Alice Williams and Saul Williams. Their contact information is included at the end of each section of the document.