Northern Ontario
ICT Utilization Study

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Final Report

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Northern Ontario ICT Utilization Study

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EXECUTIVE SUMMARY

Information and communications technology (ICT) is extremely widespread and has been recognized for the competitive advantage its adoption can bring to communities, businesses and regions. In Northern Ontario, substantial efforts and investments have been made to develop ICT infrastructure that provides a level playing field for regions that are less remote and have higher population densities. Although, there are infrastructure gaps remaining and ongoing enhancements required, there was a need to analyze the current utilization of ICT and identify possible measures to increase utilization and achieve greater economic benefits from the ICT infrastructure in Northern Ontario. It was recognized that a particular focus should be on ICT adoption by small and medium-sized enterprises (SMEs). As is the case with most technological advancements, small and mediums sized enterprises often have lower adoption rates than large businesses. In an increasingly networked economy driven by innovation, this can lead to a marginalization of SMEs, particularly those in Northern and rural areas. In addition to the generic barriers to adoption such as applicability, security, management skill sets, these SMEs can face additional barriers as technology is traditionally slower to diffuse outside of urban centres. The challenge for policy makers is to understand how to assist SMEs to overcome these barriers by fostering and even creating the appropriate business environment for ICT utilization.

The Northern Ontario ICT Utilization Study was initiated by the Northwestern Ontario Innovation Centre (NOIC) in partnership with the Sault Ste. Marie Innovation Centre (SSMIC) for the purposes of indentifying the current state of ICT utilization amongst regional SMEs and communities. To achieve this, several primary research methods were undertaken including the development of a website with an online survey distributed to 225 businesses, the completion of a number of targeted focus groups throughout the region, and a telephone survey of 300 Northern Ontario businesses conducted by Oraclepoll Research Limited. In addition, secondary research was conducted into international, national and regional best practices, trends and success stories.

A number of key policy recommendations were derived from this research and are elaborated on in the attached report. These recommendations are focused on creating the business environment to support increased ICT utilization in Northern Ontario with recognition that commercial considerations and profitable returns are the principle drivers of SME adoption and profitable use.

INTRODUCTION

Purpose

In the recent Places to Grow Discussion Paper, the provincial government announced that a Growth Plan for Northern Ontario will be developed under the Growth Act, 2005 and will become the blueprint for the region's economic future. The discussion paper identifies a number of key issues affecting the region including:

- The unemployment rate for Northern Ontario has typically been two percentage points higher than the rest of Ontario, but narrowed in 2007. Youth unemployment rates have been about four percentage points higher. First Nations communities are experiencing even greater levels of unemployment.
- Growing emerging sectors and increasing education and training initiatives, particularly those relating to the commercialization of innovations in niche sectors in Northern Ontario, have been identified as priority goals for moving forward.
- Highlighted is the need for building partnerships with First Nations communities to provide better education and training opportunities.
- The Paper recognizes the issue of youth out-migration in Northern Ontario and recommends youth retention efforts focusing on educational opportunities and linkages to career development.

The transition that is taking place in the Northern Ontario economy from one that has traditionally been highly dependent on extractive industries to one that embraces value added business opportunities in the science and technology sectors will help enhance the competitiveness of the region, attract and retain highly skilled jobs, and mitigate youth outward migration. The Northern Ontario Information Communication Sector (ICT) sector is rapidly growing and could become an important component in the provincial knowledge-based economy over the next 25 years. In keeping with the realization of a new economy for the North, ICT is being recognized as a means to provide both new business opportunities and greater efficiency for traditional industries. The Northern Ontario ICT Utilization Study has been developed to help further understand the growing ICT sector and the important role it will play in the region's economic future. Specifically, the purpose of the study is to discover the technologies in the ICT field that could positively affect businesses in Northern Ontario and highlight those technologies that can have the most profound effects in furthering economic growth and diversification.

NORTHERN ONTARIO ICT UTILIZATION RESEARCH

Four methods of data collection were employed--an online survey, a series of focus groups, a written survey completed by focus group participants, and a telephone survey. The research methodology and results are summarized in the following sections.

Online Survey

Methodology

An online study was performed in the summer of 2009 by the Sault Ste. Marie Innovation Centre and Northwestern Ontario Innovation Centre.

A website was created to deliver a survey designed to understand the businesses that directly influence ICT in Northern Ontario. Over 225 companies from throughout Northern Ontario were invited to participate through a series of emails extending over a two month period. The emails themselves provided both an introduction explaining the purpose of the survey, an approximation of the time commitment expected of participants, and a link directing them to the website. The response rate was approximately 20% with a total of 46 surveys being completed. The breakdown of all contacted parties is as follows:

Northeastern Ontario:

67 ..... Sudbury

49 ..... Sault Ste. Marie

28 ..... North Bay

10 ..... Timmins

4 ..... Wawa

3 ..... Elliot Lake

1 ..... Chapleau

1 ..... Blind River

Northwestern Ontario:

51..... Thunder Bay

3..... Kenora

2..... Dryden

2..... Sioux Lookout

2..... Fort Frances

1..... Geraldton

1..... Red Lake

2..... Undisclosed

A more complete breakdown that includes company information provided of those who participated can be seen in Appendix 1.

It is interesting to note that this list contains additional towns that were not included in the contact list. These towns are outlying communities of larger cities such as Timmins and North

Bay. The top 4 respondents by location were Thunder Bay (14), Sault Ste. Marie (8), Sudbury (5), and North Bay (4) respectively.

Results and Analysis

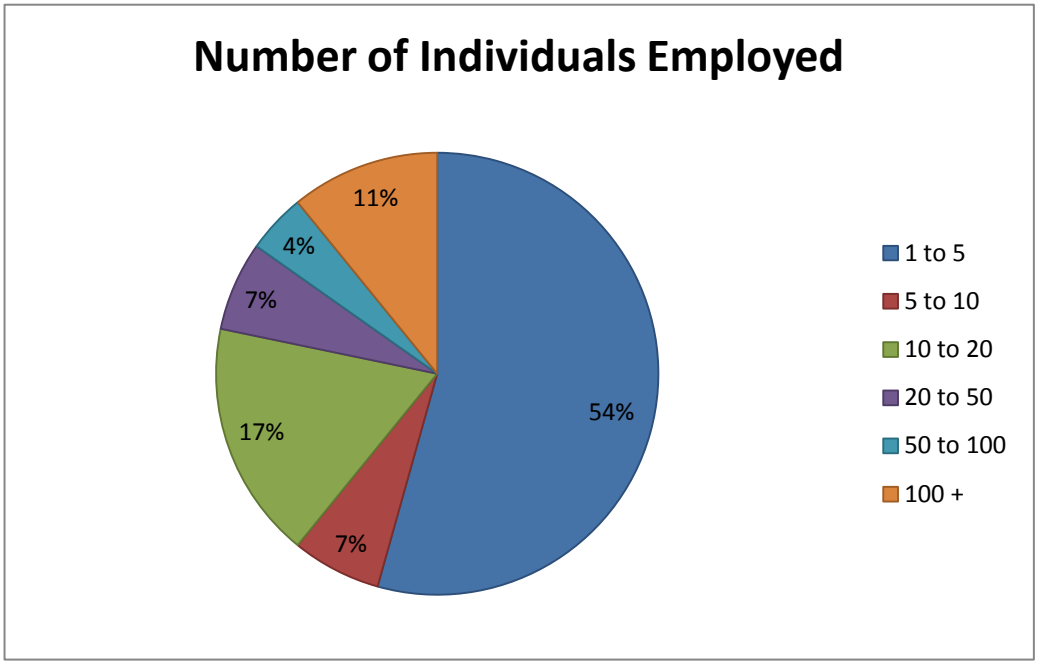
A summary of the key findings reveal that:

- Majority of the ICT respondent organizations in Northern Ontario employ between 1 to 5 individuals; 54% (Figure 1).
- The top three business offerings of those surveyed were IT Consulting, Hardware/Software Sales and Support, and Web Development (Figure 2).
- 78% respondents claimed they expect to expand their operation in the next 12 months (Figure 3).
- 20% plan to add new locations in the next 12 months (Figure 3).
- 65% of the organizations expect to hire new staff in the next 12 months (Figure 3).
- The top three skill sets IT companies were most interested in were Sales and Marketing, Business Skills, and Programming (Figure 4).
- 70% of participating businesses felt it is difficult to find skilled labour (Figure 5).
- The top 3 skill sets that participants expected difficulty recruiting were Software Development, Web Development, and Custom Software Development (Figure 6).
- The satisfaction of participants had towards recent graduates were mixed; 9% indicated they were very satisfied, 28% were satisfied, 26% were neutral, 18% were dissatisfied, and 2% were very dissatisfied (Figure 7).

Question 1

How many individuals are employed at your company?

FIGURE 1



Of those that participated in the study, the majority of the organizations employ 1 to 5 people capturing 54% of the study populus (Figure 1). Of the remaining, 7% employ 5 to 10 individuals, 17% employ 10 to 20 individuals, 7% employ 20 to 50 individuals, 4% employ 50 to 100 individuals, and 11% employ 100+ individuals.

Question 2

Please describe the innovative (unique) products/services your company offers?

This question allowed for an open ended response by participants. Many participants took the time to highlight a few unique offerings their organization provides while others gave an extensive list. Some innovative and unique products/services highlighted by participants included:

Infonaut

Infonaut develops map-based decision-making tools for infectious disease surveillance and control. Infonaut's web-based application suite, Infonaut Live, consists of three separate products: Hospital Watch Live, Infection Watch Live and Region Watch Live. These location-

based business intelligence solutions provide disease surveillance, emergency preparedness, planning and response at different geographic thresholds: in-building, community-level, and state/provincial/federal.

CCS

CCS has developed robust, custom software in the areas of industrial weight scale systems (saw/pulp mills), geographic information systems, portable in-field data collection, inventory management, sales, tourism and human resources. One of these products is GEREMA, a software package for managing and reporting spatial data which is built on ESRI ArcObjects and Microsoft's latest .NET technologies.

Contact Nord

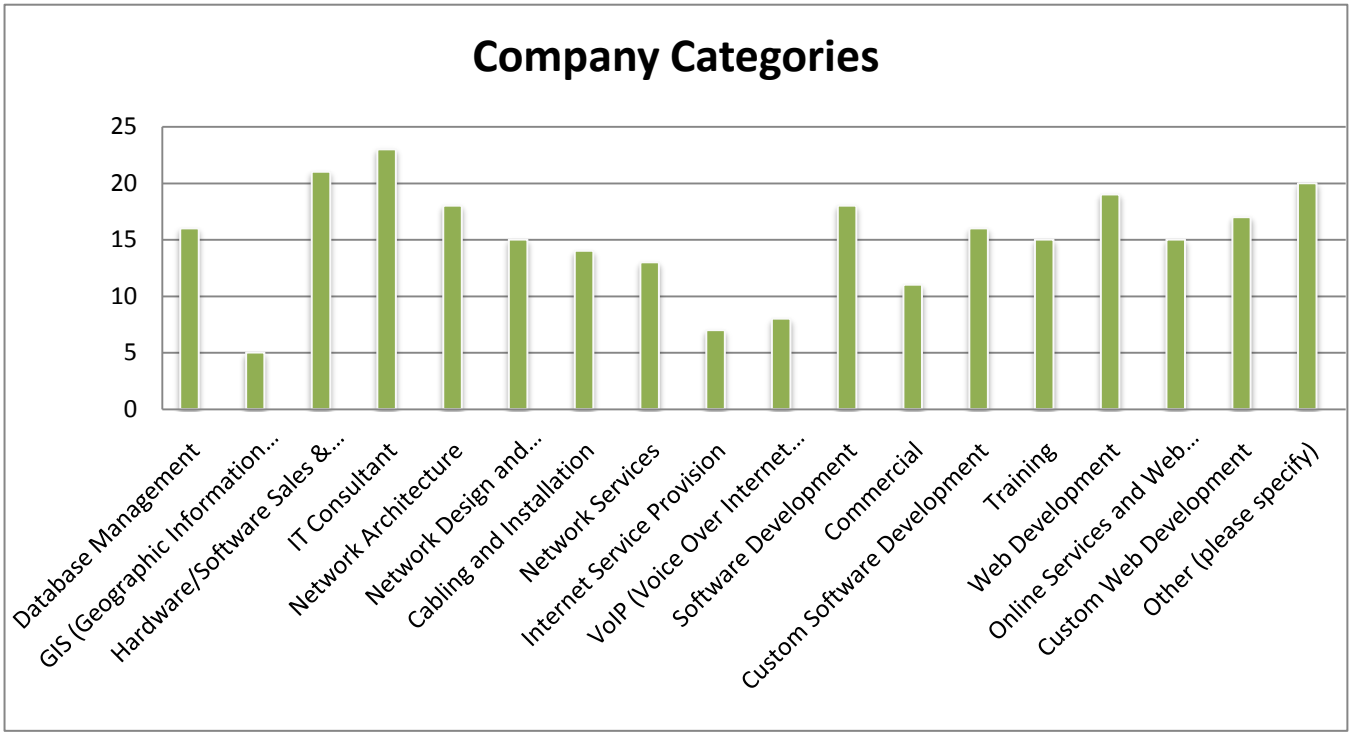
Contact Nord is Northern Ontario's Distance Education and Training Network. They facilitate access to the education and training opportunities offered by Northern Ontario's colleges, universities and other training organizations. Access to the education and training opportunities is provided using learning technologies such as audio conference, videoconference and e-learning serving learners in 92 small and remote communities across Northern Ontario.

More unique and innovative products/services can be found in Appendix 1.

Question 3

What category or categories should your company be listed in?

FIGURE 2



This question was assembled as a multiple choice offering, allowing participants to choose amongst various categories. In addition to having a precompiled list to choose from, participants were also provided with an additional "Other" category which allowed them to fill in categories not included on the initial list. As can be seen in figure 2 above, most, if not all, companies participating in this study had multiple classifications. The top three categories of those surveyed were "IT Consultant" with 23 selections, "Hardware/Software Sales and Support" with 21 selections, and "Web Development" with 19 selections. The "Other" category garnered quite a bit of attention with 20 organizations choosing this selection. The list of categories generated through the "Other" category can be found in Appendix 1 – On-Line Survey Responses.

Questions 4, 5, 6

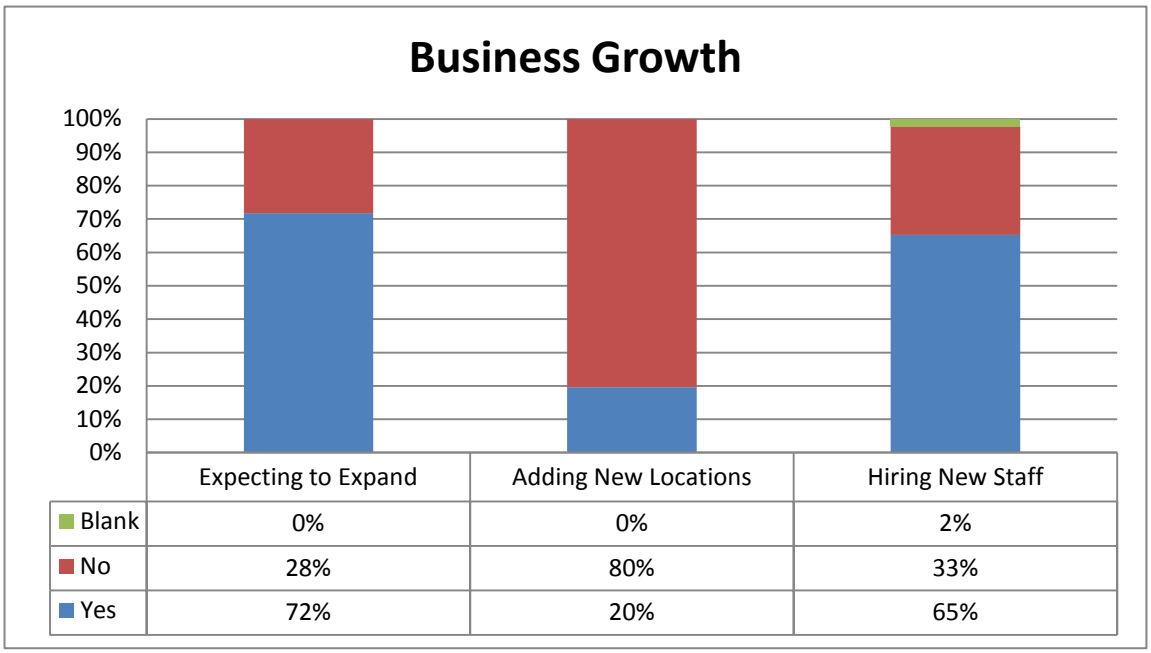
These three questions revolved around the future expansion plans of the companies surveyed and are summarized in the chart below. The specific questions asked included:

Q4. Do you expect to expand your business in the next 12 months? (See chart below)

Q5. Will you be adding new locations? (See chart below)

Q6. Will you be hiring additional staff? (See chart below)

FIGURE 3



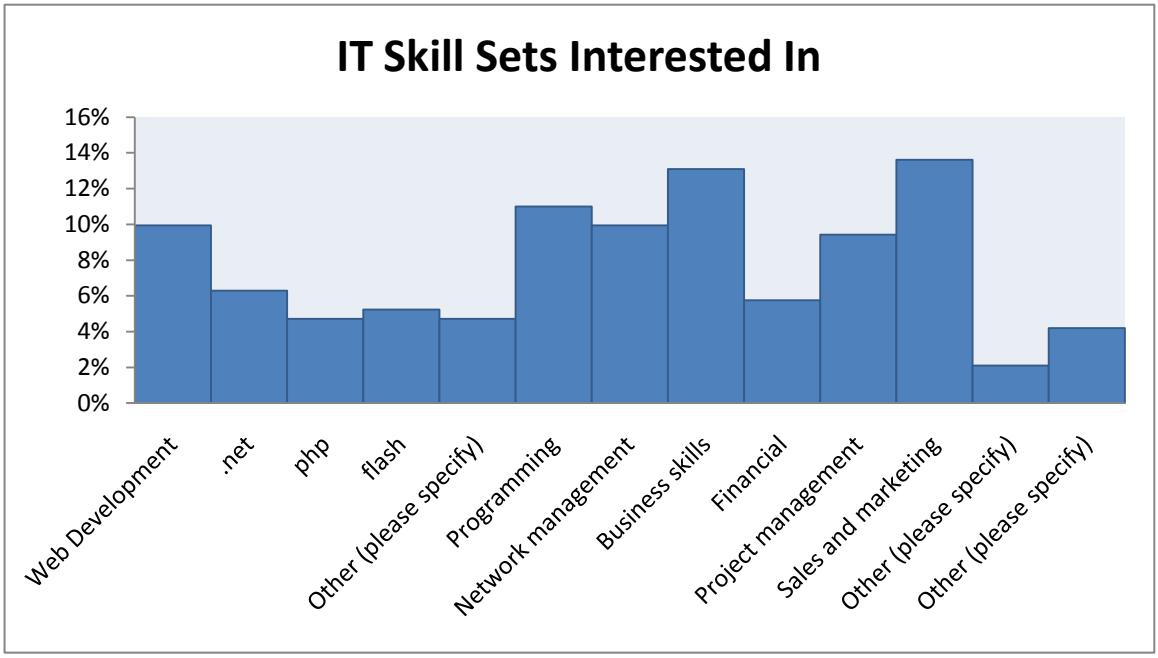
	Expecting to Expand	Adding New Locations	Hiring New Staff
Blank	0%	0%	2%
No	28%	80%	33%
Yes	72%	20%	65%

Of the respondants, 78% claimed they expect to expand their operation in the next 12 months. Of the organizations expecting to expand 20% plan to add new locations in the next 12 months, and 65% expect to hire new staff in the next 12 months (Figure 3).

Question 7

What IT skill sets is your organization most interested in?

FIGURE 4

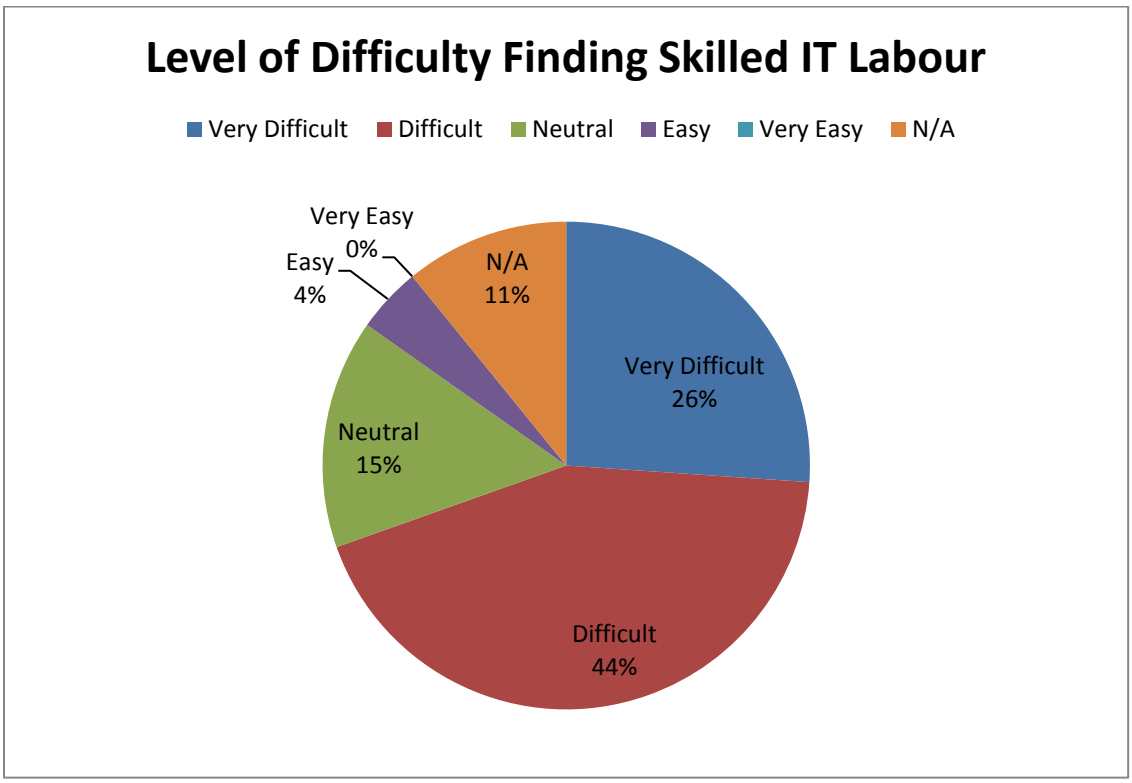


To get an understanding of the skill sets that interest ICT organizations the multiple answer question “what IT skills sets is your organization most interested in?” was asked. The responses are compared and summarized in figure 4 above. As can be seen fom the results, the three areas that garnered the most interest amongst participants were Sales and Marketing with 25 selections, Business Skills with 24 selections, and Programming with 22 selections.

Question 8

What is the difficulty level of finding competent IT skilled labour for your organization?

FIGURE 5

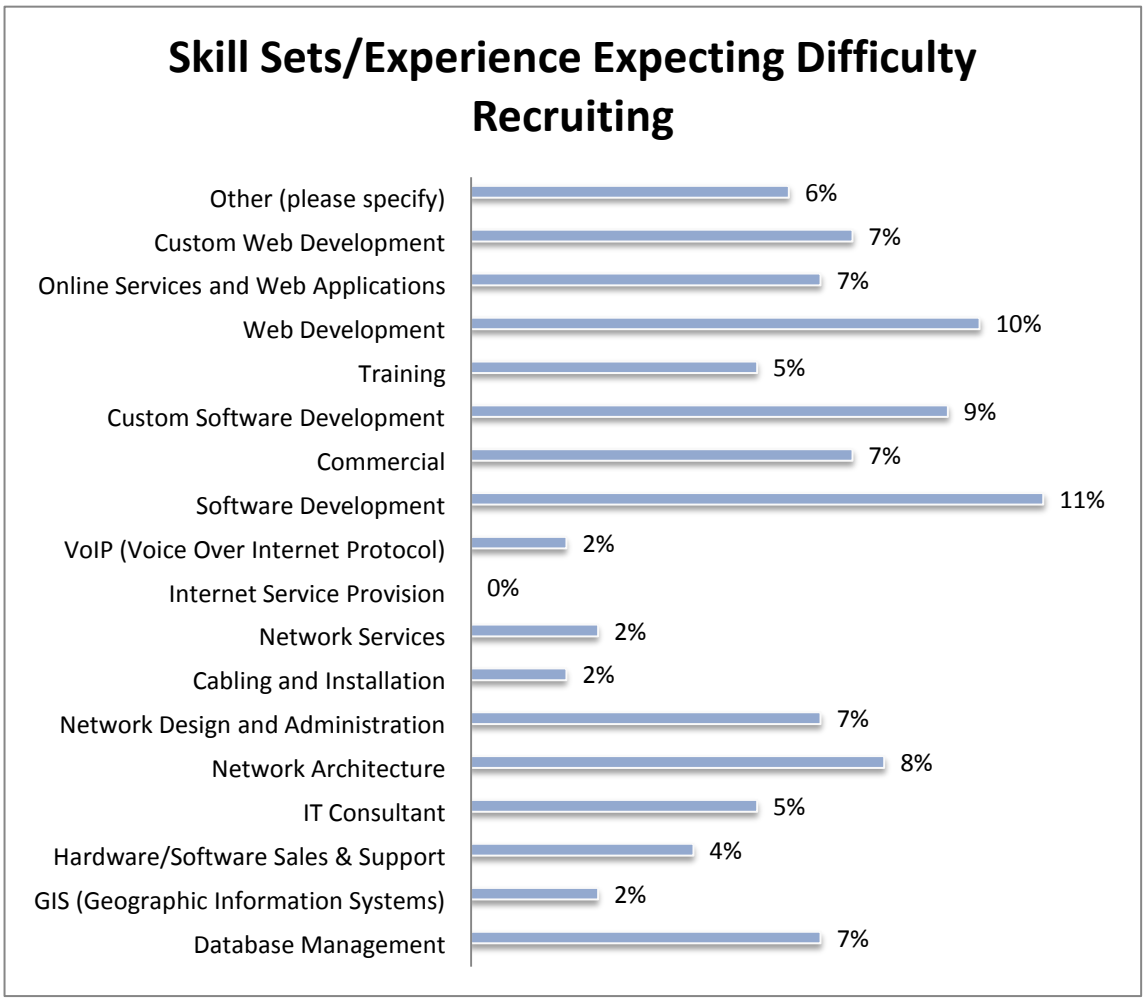


To understand the availability of skilled labour required for the ICT sector the question "What is the difficulty level of finding competent IT skilled labour for your organization?" was posed to participants. The results are summarized in figure 5 above. The figure shows that businesses feel it is either difficult (44%) or very difficult (26%) to find skilled labour. This demonstrates the scarcity of ICT-based knowledge workers in Northern Ontario.

Question 9

What skill sets/experience levels do you expect difficulty in recruiting? This question allowed participants to choose from a predefined list as well as an "Other" option. The results are summarized in figure 6 below.

FIGURE 6

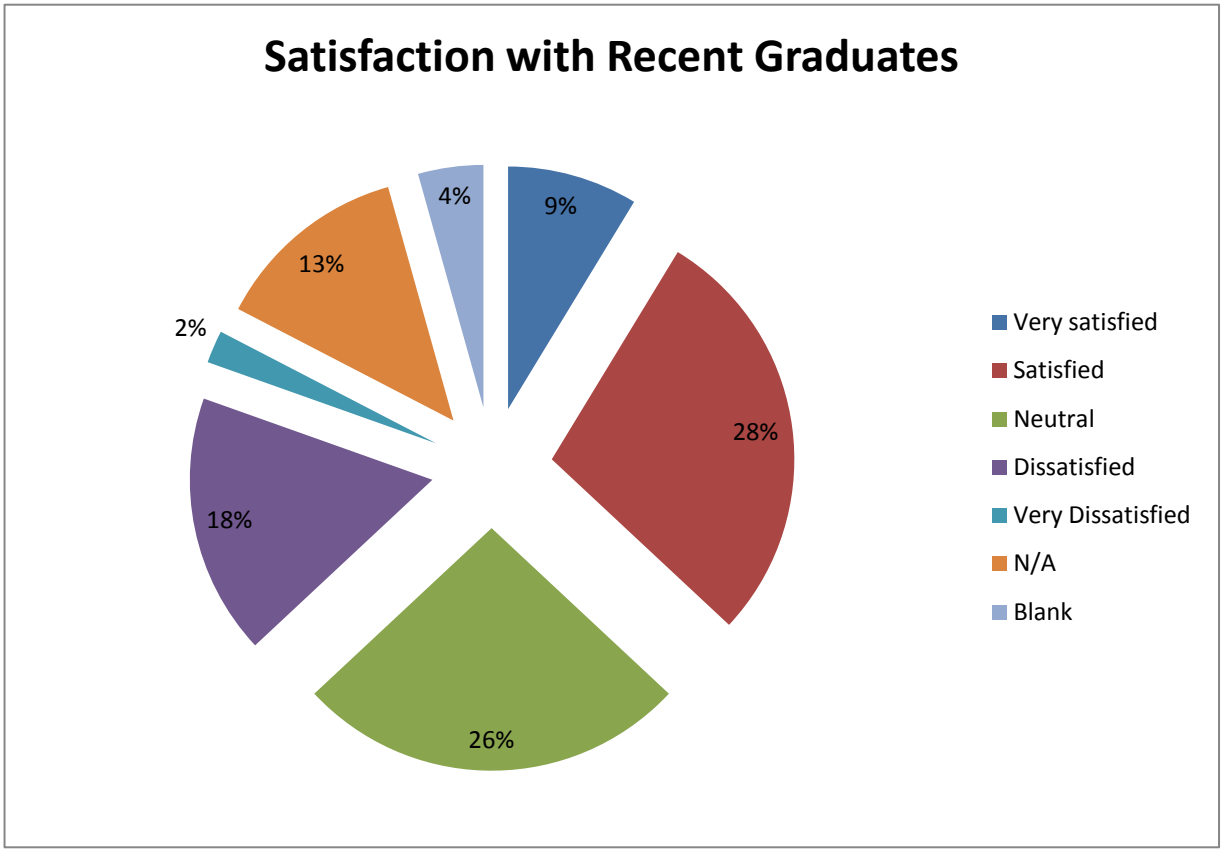


From the results summarized in figure 6 above, the top 3 areas chosen to give the surveyed organizations the most difficult is Software Development with 18 selections, Web Development with 16 selections and Custom Software Development with 15 selections.

Question 10

How satisfied are you with recent graduates meeting your needs?

FIGURE 7



The outcome of this question displayed mixed results. Of those surveyed 9% were very satisfied, 28% were satisfied, 26% were neutral, 18% were dissatisfied, and 2% were very dissatisfied. The remaining answers were either Not Available or blank. These figures are graphically represented in figure 7 above.

Focus Groups

Methodology

As a component of the study, a number of focus groups were conducted throughout Northern Ontario in the areas of Timmins, Sudbury, Sault Ste. Marie – Algoma, Thunder Bay, Red Rock and North Bay – Nippissing. These occurred during the fall and winter of 2009/2010. The sessions themselves targeted local business leaders and invited them to explore issues pertaining to their adoption and implementation of ICT.

Results and Analysis

As these sessions were structured to allow for open discussion around a set range of questions a number of issues were identified and explored including:

- Raising awareness among SMEs of government programs and community-based organizations throughout Northern Ontario that can help support businesses to implement ICT
- Providing expanded education and training focused on basic ICT skills
- Supporting local service providers and the need to build relationships between these and SMEs
- Expanding internship programs that support SMEs and ICT related projects

Question 1

What help and support could assist your organization to overcome its IT challenges?

This question made it apparent that there are a number of issues regarding IT challenges facing businesses in Northern Ontario. General themes began to become noticeable when discussing where problems have risen. One of the major issues that exist is the essential need for training in the community. Businesses are struggling to understand basic computer skills and keep on top of fast evolving Internet trends. There is a need for skills development at all levels of an organization, including general users, support staff, and upper management. One of the key areas is web development. Through the participants comments it was apparent there is a lack of knowledge in this area. The preferred method of delivery to administer these types of training initiatives was through workshops and seminars.

Another area focus group participants discussed is the lack of IT professionals. There also seems to be a disconnect between businesses and knowledgeable IT professionals. One of the methods discussed to infuse IT skills into businesses is through an internship program. Some participants discussed their enjoyment of previous internship experiences stating they were easy to administer. Specifically, it was recommended by one group to use the Small Business Internship Program (SBIP) as an example but focusing the program on ICT utilization. The length of the internship must take in consideration the necessary time it commonly takes to implement a project. If the length of the internship program is too short of a time frame it may render the intern's projects incomplete and useless to the business.

Another method for businesses to gain access to IT professionals is through a "one stop" organization that focused on servicing businesses ICT needs. Essentially the role would be to

provide ICT information to businesses while acquiring strong relationships with local ICT firms. The goal is to provide high level support and direction while recommending reliable ICT businesses within the community to take on recommended solutions. This organization needs to be trustworthy and preferably a non-for-profit organization to foster strong relationships with clients. The desired services of such an organization include access to industry experts, high level consultation, knowledge bank, training, and training facilities.

Question 2

Are current government funding programs sufficient to meet your organization's IT needs?

There was a general consensus that the current government funding programs are not meeting businesses IT needs. There were many complaints about current funding programs and some of them include:

- Eligibility criteria was too strict (example: 10 employees and more eliminates small businesses)
- Application process was too long to plan future activities
- Application documents too long
- Programs ended too fast
- Matching funding amount too high

The focus groups also raised the issue that there is a lack of awareness for the programs being offered. This could be due to lack of programs to assist IT initiatives or ineffective marketing.

There was one program in particular that was well received by some focus group participants. The SBIP, they felt, was a great opportunity for their company to infuse new skills into their organization and providing a student with a learning experience. As previously stated, such a program would be more beneficial to ICT initiatives if a new program was developed to cater to this area of focus.

Question 3

How can current initiatives be improved?

Participants expressed that current funding programs need to be simplified and easier access to information. One improvement would be to streamline the reporting process for funding programs. They felt the current processes required extensive reporting beyond what they

believed was an acceptable amount. Also, government funding websites need to be easier to navigate. More efficient navigation will enable businesses to find the answers to their questions. The funding programs currently in place need to have their eligibility requirements revisited. These programs should broaden access requirements to increase uptake. This includes allowing companies with fewer than 10 employees to gain access to the programs. Funding programs also need to increase their marketing initiatives to increase awareness. This could be done through new communication tools such as social media.

Internships were also another issue discussed to improve the current initiatives. One focus group thought a specialized internship can be developed for older individuals to help assist those in career transition. A program such as this would place a higher benefit to hiring those that have been out of work.

Question 4

How could your organization benefit from future technology developments?

The majority of participants indicated that they expect to benefit from reduced operating costs associated with future technology developments. They cited social networking sites as being both a low cost and effective way for them to market their products and services online. For example, sites such as Facebook and MySpace allow businesses to interact with potential clients without the constraints of cost or location. Furthermore, social networking sites such as LinkedIn offering services specifically for the commercial and professional sectors are growing in popularity and offer a low cost alternative and/or complement to more traditional marketing methods such as attendance at trade shows, conferences, and other industry events. Respondents also anticipate that they will benefit from the increasing availability of information. Sites such as Twitter that allow users to “tweet” messages limited in size to 140 characters making for concise, manageable, and productive interactions. Users of the site can access a range of information quickly from other users around the world. This can serve to not only help answer their own questions, but can be used a tool to drive traffic to company blogs or websites. Many mobile devices now have applications specifically related to social networking and participants felt that this was only going to increase as new devices become available enabling them to increasingly work productively outside of the office.

Participants believe that programs that help SMEs to take advantage of these new technological developments will become increasing important to them. They indicated support for the notion of expanding internship programs particularly those that focus on ICT-related projects such as the SBIP as discussed in question 2 above. Internship programs were described by participants as an effective means to help and support organizations in overcoming their ICT

challenges, while at the same time providing valuable hands-on work experiences for students. Many participants who had investigated and taken part in internship programs indicated that they were pleased with the experiences that they had and expressed how beneficial it was for them to work with students who, in many cases, provided them with fresh and novel ideas to utilize ICT more effectively to enhance their competitive positions.

Question 5

What would increase utilization of ICT?

Participants felt that there were a variety of factors that could contribute to an increase in the utilization of ICT. By far the majority of these focused on education and training, particularly at the managerial level, that would serve to build organizational capacity. Specific suggestions included the design and development of basic computer training programs that could be delivered either by the government or by regional not-for-profit groups, as well as making available case studies for businesses, which would be tailored to be applicable to their needs. Many felt that greater promotion of local success stories would increase interest, build awareness and drive utilization. Some groups called for the creation of a business start-up kit that provided detailed information on ICT requirements (i.e. backup, server, service providers, etc.) and would help identify local specialists. It was felt by many that this kit would benefit SMEs by providing them with the information they need in order to incorporate ICT as part of their business plan and growth strategy.

Question 6

How do we increase the economic benefits to Northern Ontario through the use of ICT? What sectors or areas need focus?

It was suggested that many business owners do not necessarily want to become experts in ICT, but that (as identified above) they would like to increase their basic skills and learn how the implementation of ICT can benefit their organizations. With this in mind, there was broad support for increasing the role of government in providing support in the areas of: funding program utilization, referrals to local service providers, and the creation of ICT starter kits for businesses. University resources could be leveraged to the extent that distance education opportunities can be expanded to be available to professionals located throughout the North.

An overarching concern was that education and training should support awareness about the proper use of social networking and other sites that are often be blocked by employers. Participants felt that when these sites are used to their potential they can be powerful tools for

business development and that corporate policies should reflect this if organizations are going to be competitive in an increasingly networked society.

Focus Group Surveys

Methodology

During each of the aforementioned focus group sessions a paper-based survey was distributed and collected at the conclusion of each session. For those who requested it and those who were unable to complete the paper based survey, an electronic version of this was made available by email. These surveys gave participants the opportunity to delve more deeply into the issues discussed at the focus group sessions, in the hopes that they would share additional details that they may have been reluctant to as part of the larger group. A total of 97 surveys were completed and the results are summarized below.

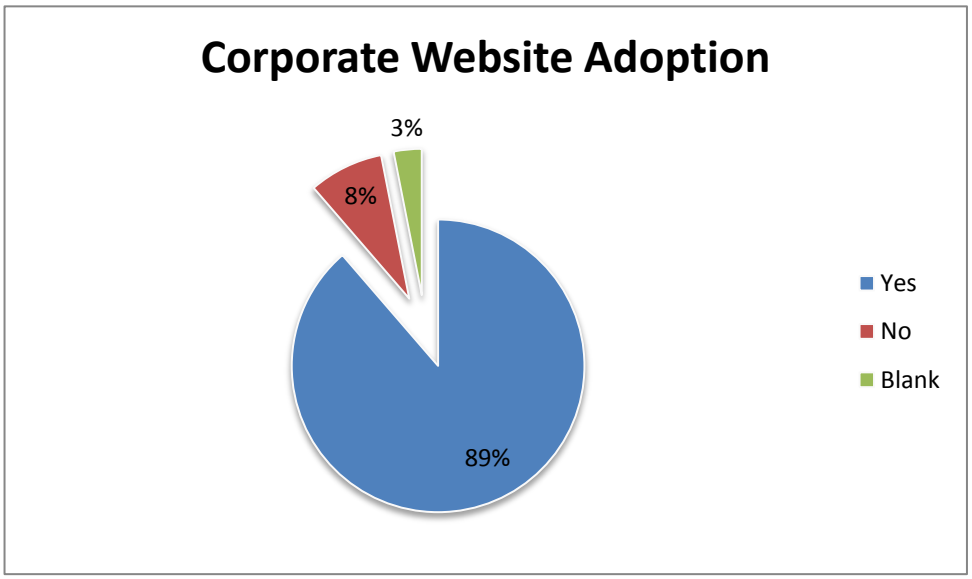
Results and Analysis

The majority of the participants that filled out the survey had an interest in ICT initiatives. These initiatives varied considerably. For instance, some participants were new to ICT practices and pursuing the opportunities while others have been heavily involved with ICT for years. This may have resulted in a slightly higher ICT usage rate than the general populous.

Q1. Does your company have a website?

A majority of respondents, 89%, signified that their company has a website.

FIGURE 8



The amount of company's adopting corporate websites is considerable larger than what was found in the NEOnet Business Survey Report 2009 with 66% of businesses having a web presence. Statistics Canada also released a study title Study of Electronic Commerce and Technology in 2008 that posted even smaller percentages. Statistics Canada's figures show that 41% of all firms own a website in 2007. Forecasting the reports figures would estimate 45% of firms in 2009 have a website.

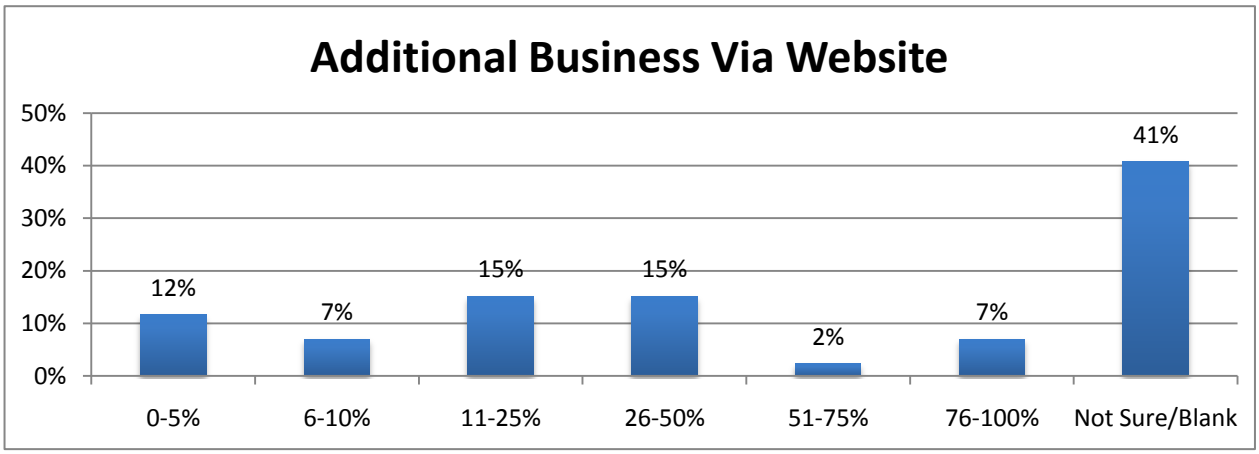
There could be a number of possibilities as to why there is such a difference. One suggestion stems from the fact that a majority of the participants had an interest in ICT initiatives. Therefore these participants have already pursued a corporate website.

Q2. How much additional business has been attracted to your organization as a result of your website?

The response rate for this question was overwhelmingly poor. Of those surveyed, 41% did not provide an answer. Of those that did provide a valid response, 15% indicated that their company website attracted 11%-25% additional business and another 15% indicated that their company website attracted 26%-50% additional business.

Other responses from this question showed that: 12% had a 0%-5% increase of additional business, 7% had a 6%-10% increase of additional business, 2% had a 51%-75% increase of additional business, and 7% had a 76%-100% increase of additional business.

FIGURE 9



A hypothesis for such a low response rate is due to that lack of statistical knowledge in this area. It could be due to the respondents' lack of involvement with the website or lack of data mining initiatives by their company.

Participants were also given the opportunity to provide comments which can be found in Appendix 2.

Q3. Beyond your website, do you undertake additional marketing activities online?

Forty percent of all additional marketing activities online were social media related. The most common social media outlets included Facebook, Twitter and blogs. The next popular methods of marketing online beyond a website were search engine optimization (SEO) and advertisements. SEO accounted for 18% of all responses and advertisements accounted for 16% of all responses. Other responses to this question alluded to website links (6%), Newsletters (2%), email (1%) and other (5%). Five percent of the responses fell under the category "other" and are shown in Appendix 2.

Eight percent specified that they do no additional online marketing beyond their website. Also, 4% did not provide a response when filling in the questionnaire.

This question allowed respondents to provide multiple answers thus the count totals will be higher than the total amount of respondents. In total 160 responses were calculated.

FIGURE 10

As the results show, a large amount of responses indicated that their organization participates in social media. Social media has taken the ICT world by storm in the last few years with help with many of these applications being free of charge; including popular sites such as Facebook and Twitter. The results indicate the quick adoption of these practices and one may hypothesize that the impact of social media on the business world will only increase.

It is also noteworthy to mention that more than half of those individuals surveyed were attending a social media or web marketing workshop at the time. These workshops were used as an attraction mechanism to provide an opportunity to reach a larger group of people.

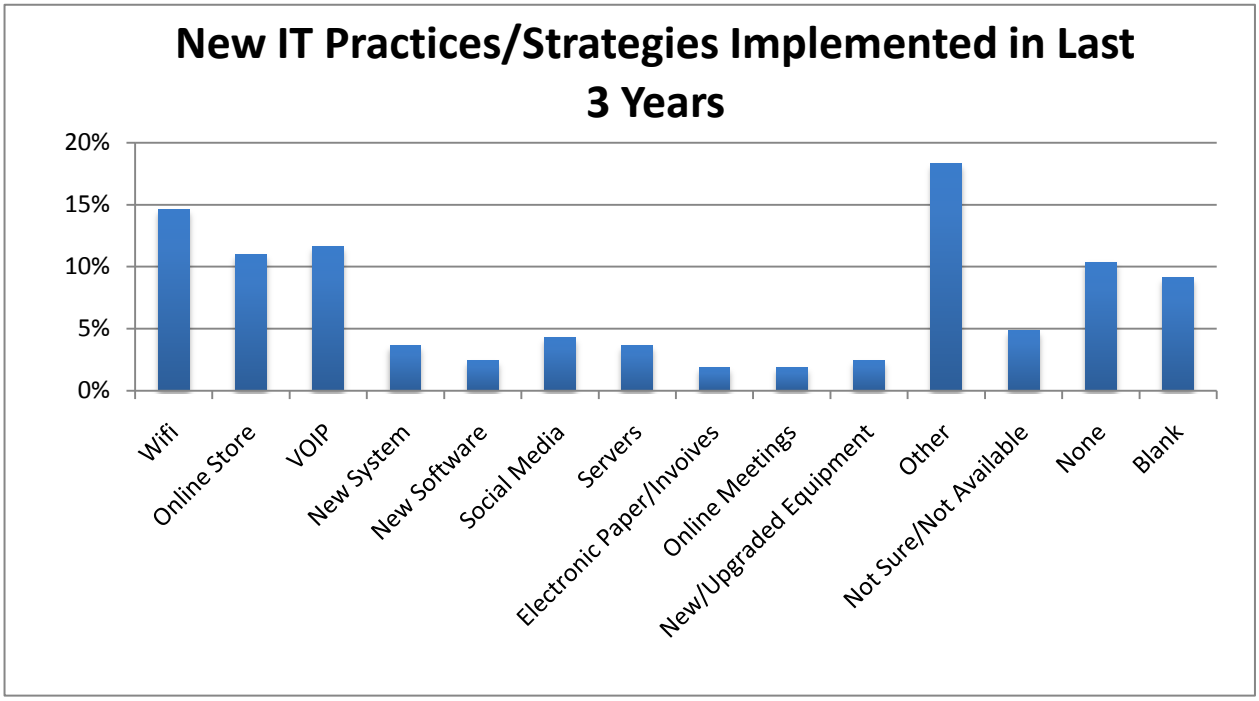
Q4. What new IT practices/strategies has your organization implemented in the last 3 years?

The results of this question showed that companies are implementing a wide variety of various IT practices and strategies in Northern Ontario. This can be shown by the overwhelming total for the "Other" category that accounted for 18% of the responses. Some of the initiatives that were in this category include:

- Increased online services
- Organizational-wide intranet
- Online availability of information
- Voice mail to email messaging service

Wi-Fi, Online Store, and VoIP were the most common responses from the participants amassing 15%, 11% and 12% of the responses respectfully. Other responses include: new system (6%), new software (4%), social media (7%), servers (6%), electronic papers/invoices (2%), online meetings (2%), and new/upgraded equipment (2%). Additional responses showed that 10% have not implemented any IT practices/strategies in the last 3 years, 5% of respondents were either not sure if their company had implemented new IT practices/strategies in the last 3 years or this information is unavailable, or respondents chose to leave this question blank. A full list of responses can be seen in Appendix 2.

FIGURE 11



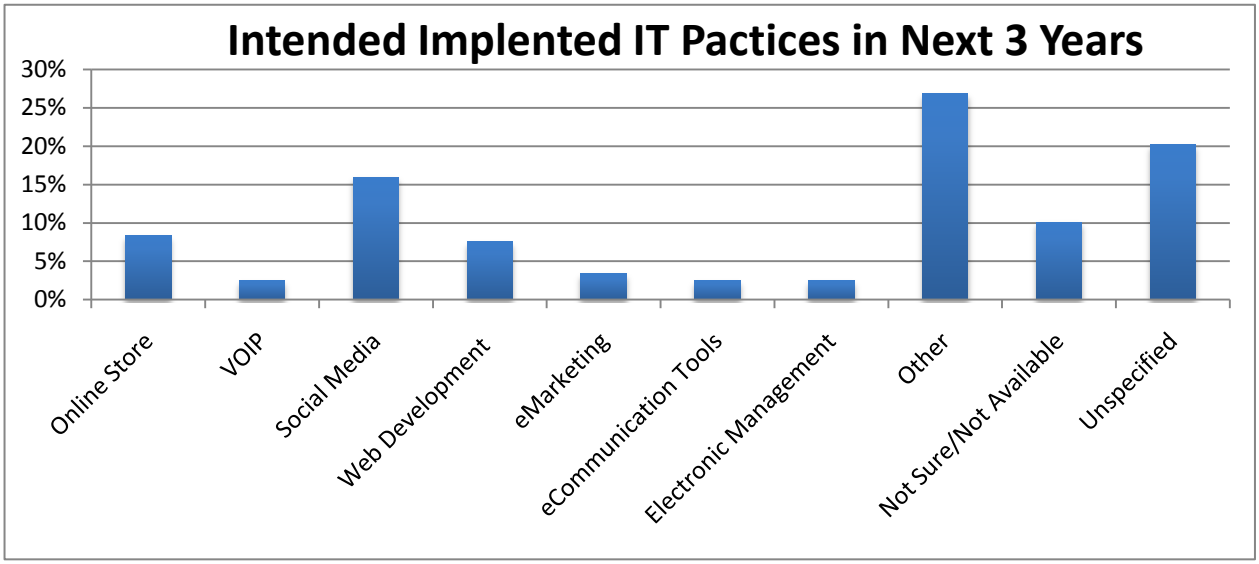
Q5. What IT practices does your organization intend to implement or pursue in the next 3 years?

The responses for this question are similar to Question 4. The majority of the responses fell into the "other" category showing a wide variety of new IT practices are in the planning phases with the intention of being implemented in the next 3 years. This category accounted for 27% of the responses. An edited version of responses can be seen in Appendix 2.

It seems as though respondents were rather hesitant to answer this question resulting in 20% leaving the question blank. This large percentage could quite possibility be connected to those that responded "Not sure" or "Not available" which totaled 10%. These rather high responses for such a question may be attributed to the lack of planning of IT practices within their company or lack of communication.

Beyond the low response rate, social media was the most common IT practice that organizations were planning to implement in the next 3 years. Sixteen percent of those surveyed commented that they were going to implement a form of social media in the next three years. Other responses to this question included online store (8%), VoIP (3%), web development (8%), e-marketing (3%), e-commerce tools (3%), and electronic management (3%).

FIGURE 12

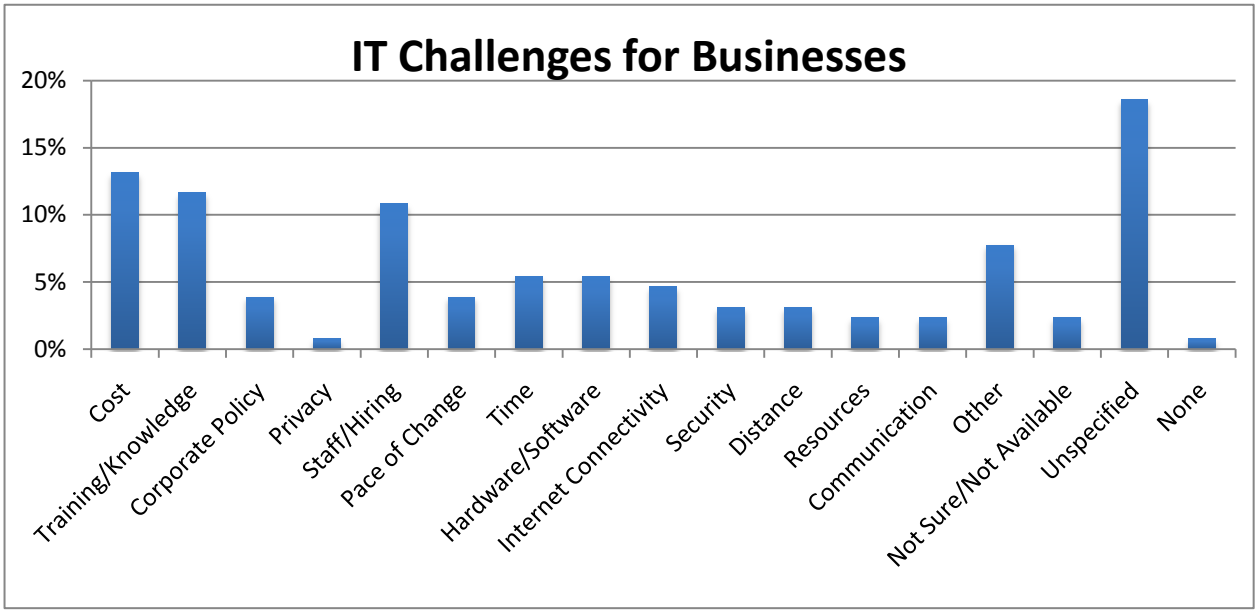


Q6. What are some of the challenges that your organization has faced implementing IT?

This question alluded to a wide variety of challenges that organizations in Northwestern Ontario are facing. Thirteen percent of the responses highlighted cost to be the most common challenge among businesses in Northern Ontario. Twelve percent of the responses indicated that training/knowledge was another key challenge facing Northern Ontario organization. Another key challenge for Northern Ontario businesses is staff/ hiring (11%). Additional common responses for this question included: corporate policy (4%), privacy (1%), pace of change (4%), time (5%), hardware/software (5%), internet connectivity (5%), security (3%), distance (3%), resources (2%), and communication (2%). Eight percent fell under the "other" category. An edited version of the responses can be viewed in Appendix 2.

This question also resulted in a rather large amount of unspecified answers (19%). Two percent of the responses were Not sure/Not available and one percent of the responses were none.

FIGURE 13



Q7 - How has your organization overcome these challenges?

There were a wide variety of ways the organizations surveyed overcame the challenges presented in question 6 of this survey. Some of the methods used include:

- Self-educated
- Talked to industry professionals
- Attend seminars
- Project-based funding

Many of the responses indicated that their challenges have not yet been met. Some participants responded with:

- We have not
- Still need money
- Stalled progress

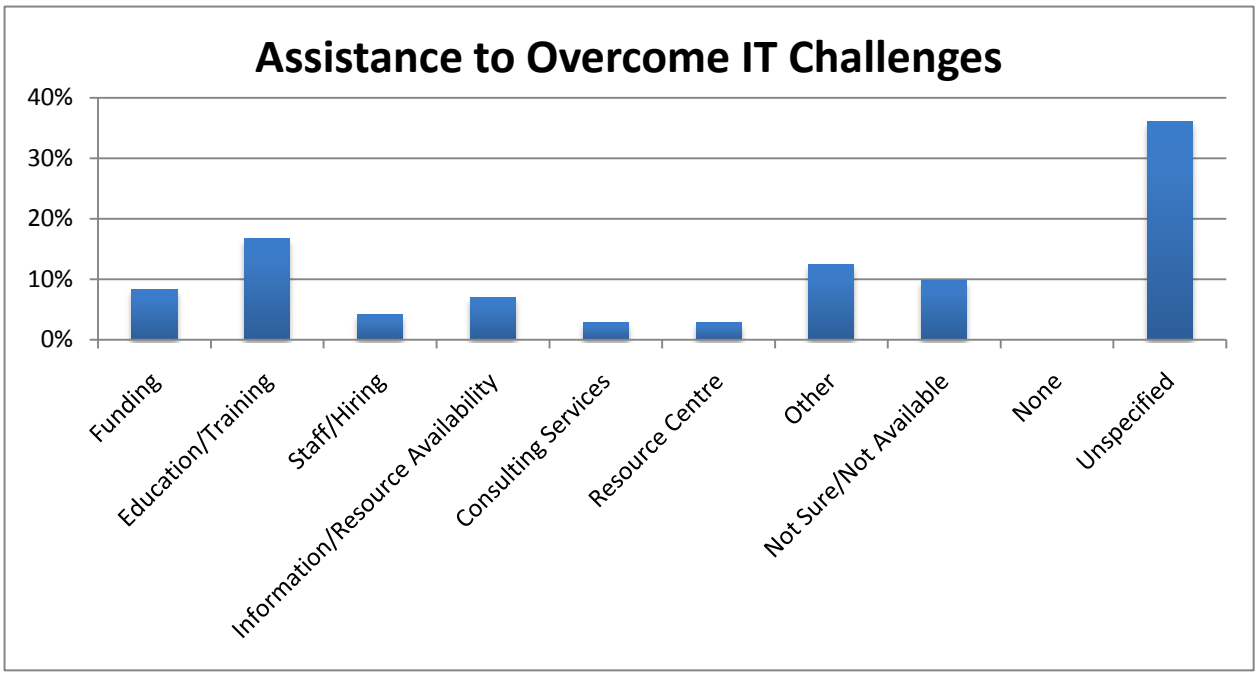
A compiled list of all the responses can be found in Appendix 2.

Q8 - What help and support could assist your organization to overcome its IT challenges?

This question determined that education and training was the most requested form of assistance by participants; accumulating 17% of the requests. Other help and support requested by participants included funding (8%), staff/hiring (4%), information/resource availability (7%), consulting services (3%), resource centre (3%), other (13%).

A large portion of respondents (36%) neglected to respond to the question. Ten percent were either not sure or the information was not available at the time.

FIGURE 14



Telephone Survey

Methodology

A telephone survey was conducted by Oraclepoll Research Limited for NEOnet representing a follow up to a baseline survey conducted in 2005. Approximately 300 businesses in total were interviewed in the areas of Timmins, Sudbury, Sault Ste. Marie – Algoma, Thunder Bay and North Bay – Nippissing.

The survey itself was conducted using computer-assisted techniques of telephone interviewing (CATI) and random number selection. Interviews were conducted in the respondents preferred language of choice by the multilingual call centre staff of Oraclepoll. A total of 30% of all

interviews were monitored and the management of Oraclepoll Research Limited supervised 100% of the calls. The complete survey results are available at www.nwoinnovation.ca.

Results and Analysis

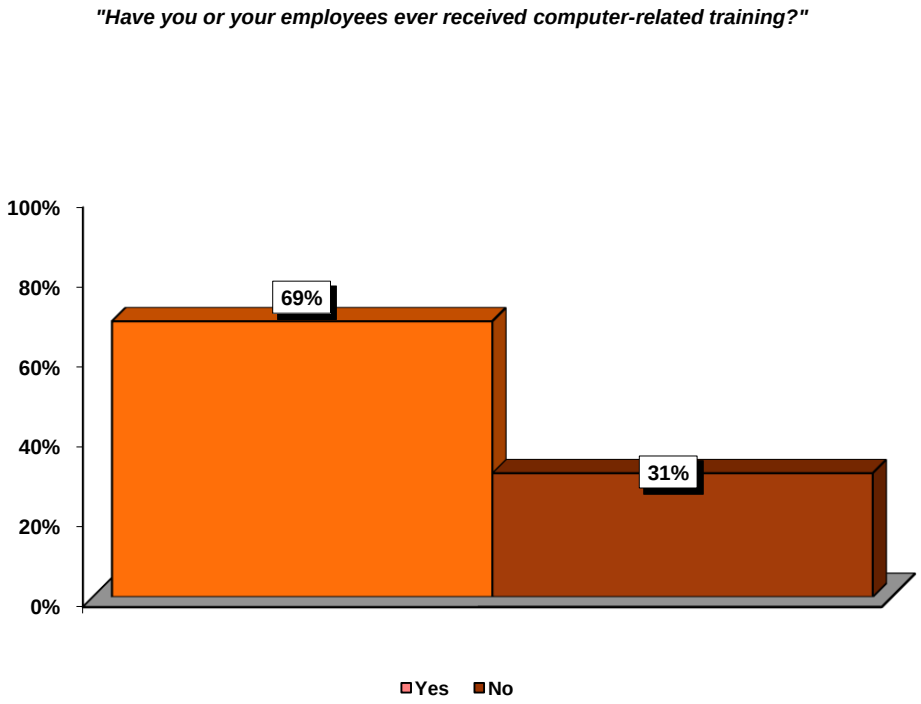
A summary of the key findings reveals that:

- Information technology is part of the business plans for only 41% of the businesses surveyed.
- 69% of respondent organizations claimed that there has been computer related training among their employees.
- 95% of businesses have Internet access.
- The top three connection types used by businesses are DSL, cable, and dialup.
- 86% of businesses indicated that they use the Internet to communicate with suppliers and clients.
- 66% stated that they have a web presence such as a website or community bulletin board.
- The most used marketing tools are email and banner ads, followed by in-text advertising and affiliate programs.

Question 1

Have you or your employees ever received computer-related training?

FIGURE 15

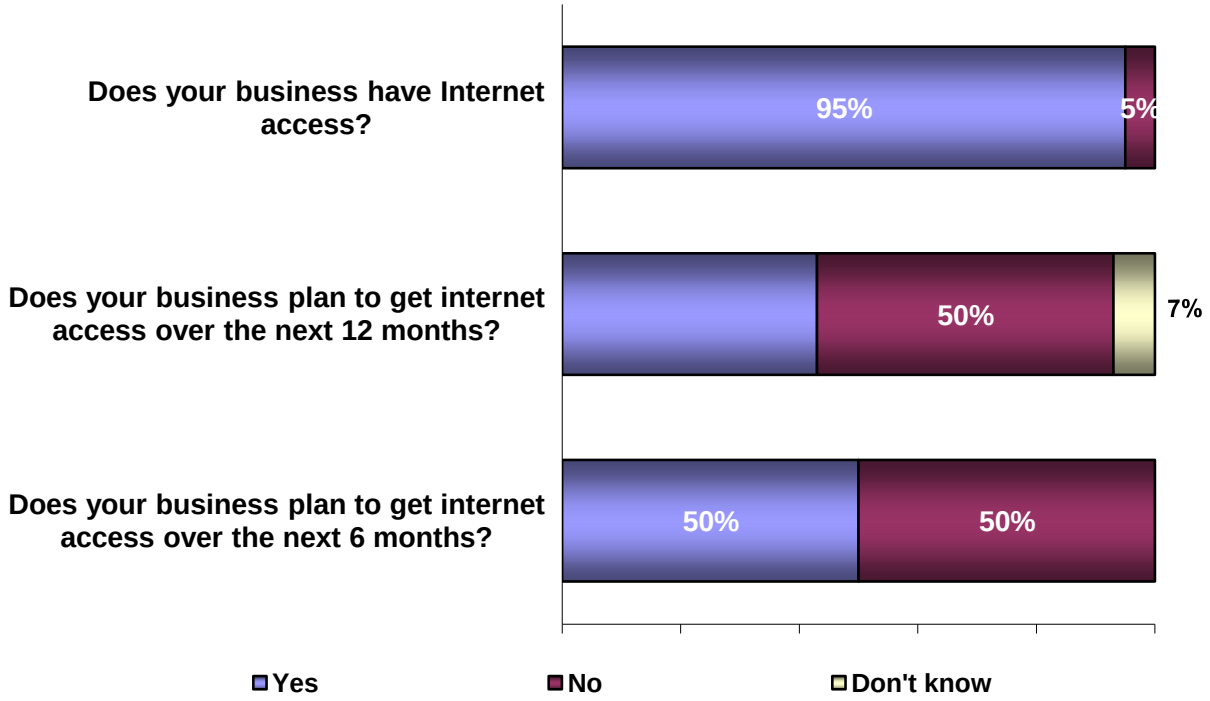


A total of 69% of respondent organizations claimed that there has been computer related training among their employees, a similar figure compared to the 70% in the 2005 NEOnet survey.

Question 2

Respondents were asked about Internet access at their organization.

FIGURE 16

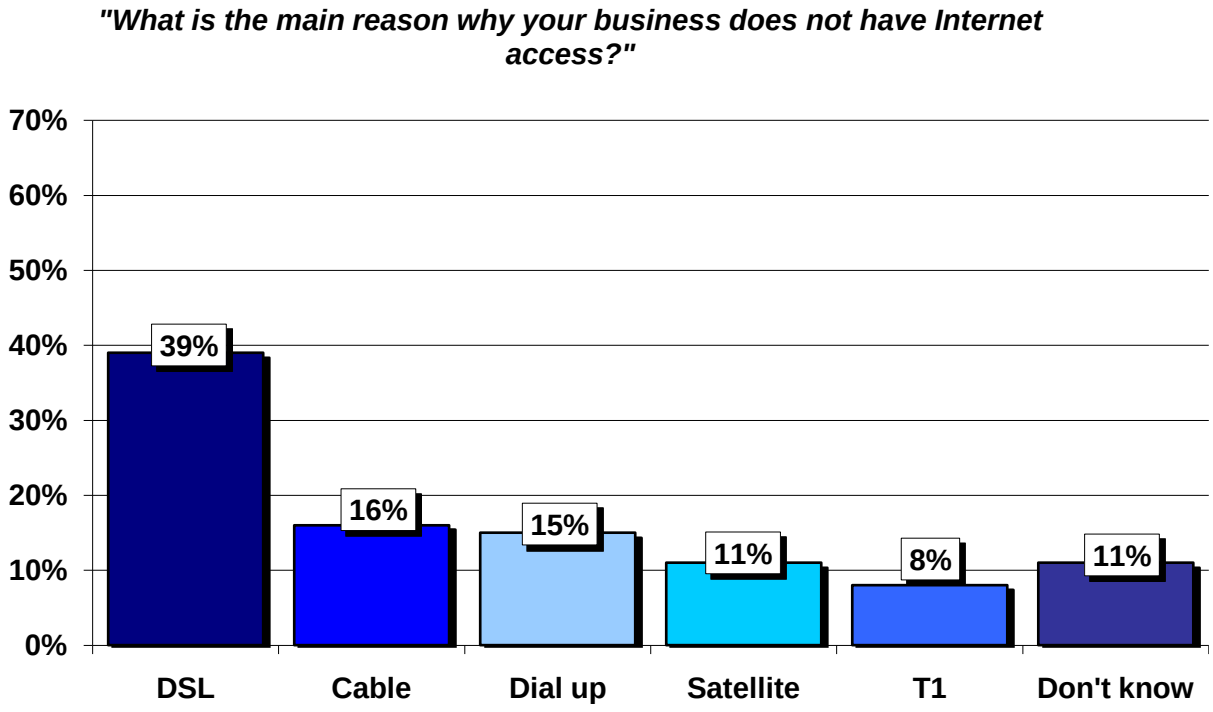


An overwhelming majority of businesses or 95% have Internet access, which is a figure slightly higher than the 92% that had access in 2005. Among the 5% of the sample that indicated they are not connected, cost was a factor cited by 43%, followed by 36% that suggested a lack of interest or need.

Question 3

What is the main reason why your business does not have Internet access?

FIGURE 17



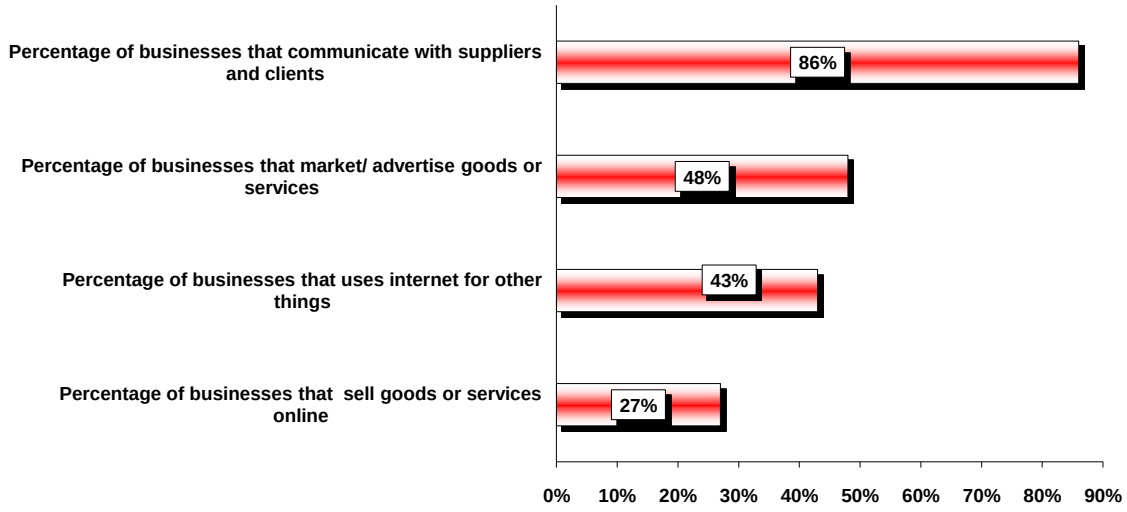
DSL is the most common type of connection used among organizations surveyed (39%), followed by cable (16%), dial up (15%) and satellite (11%). Eight percent of organizations use a T1 connection, while 11% were unsure of the type. In 2005, 55% of respondents indicated that they had high speed access.

Among the 15% of respondents with internet access that have dial up, the most cited reason for not having high speed was that it was not available in their area (56%) followed by cost (26%) and lack of need (14%). Other comments included their computer was too old (2%) and that they may soon change over to high speed (2%). A lack of availability was also the number one reason cited in 2005, but by a higher percentage of respondents (63%) while cost was named by 25%.

Question 4

Does your business use the internet for the following?

FIGURE 18



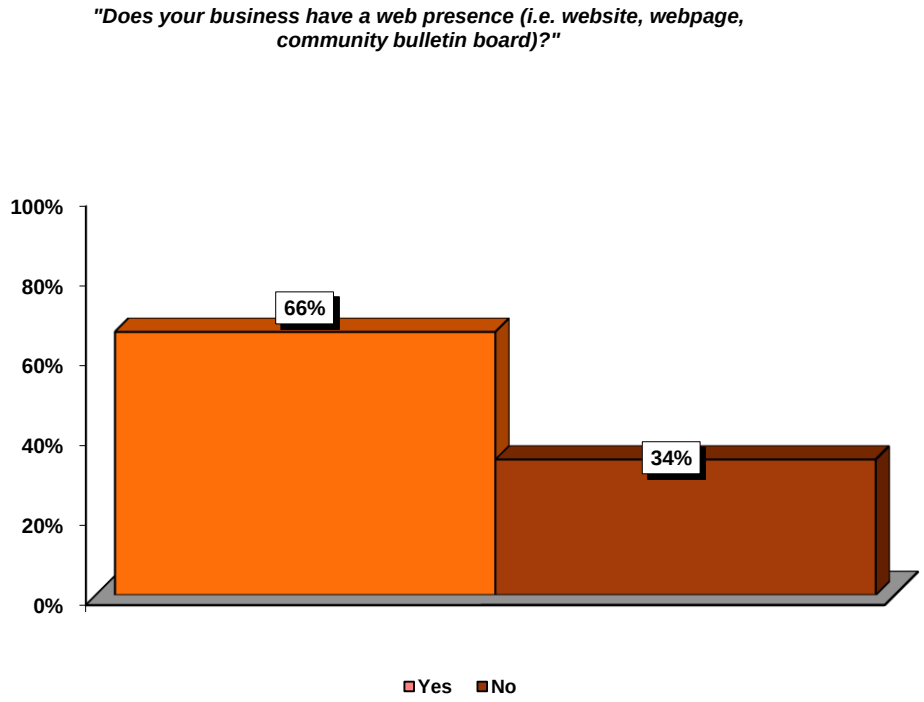
The majority of businesses or 86% surveyed said that they use the Internet to communicate with suppliers and clients as they did in 2005 (79%), while 48% said they use the Internet to market or advertise their goods and services (54% - 2005). A total of 27% (23%-2005) stated that they sell goods or services online and 43% named other purposes for using the Internet. These included financial reasons (15%) such as banking and invoicing, 12% cited research, 5% internal communications and 4% education or training.

In addition, 18% of organizations interviewed accept credit cards for completing online purchasing transactions, 4% use PayPal and 1% debit.

Question 5

Does your business have a web presence (i.e. website, webpage, community bulletin board)?

FIGURE 19

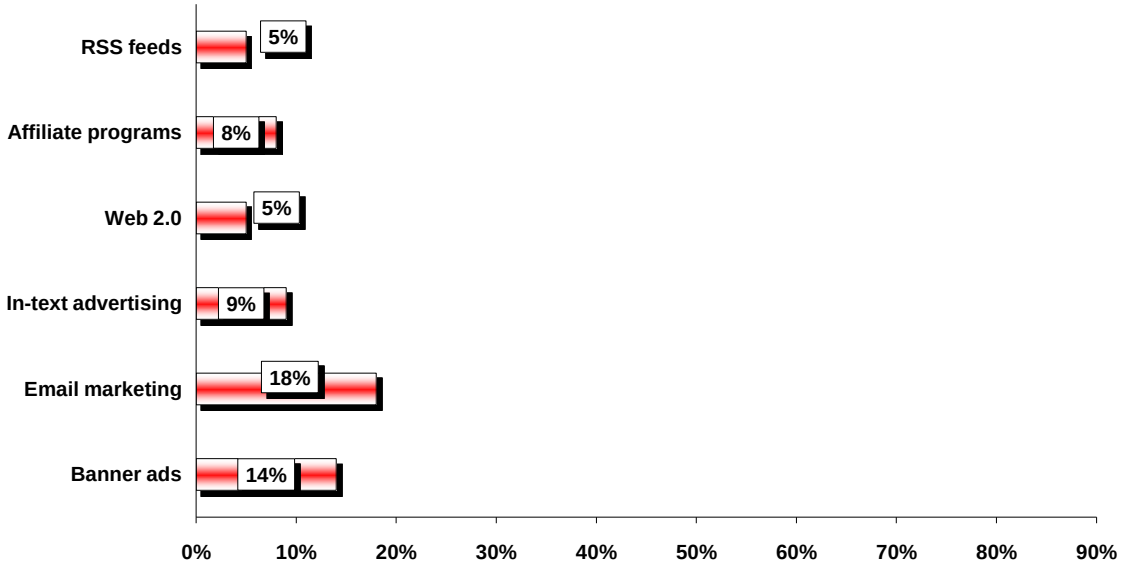


A total of 66% of respondents stated having a web presence such as a website, webpage or community bulletin board compared to less than half or 49% in 2005. Among those with a web presence, 48% indicated that their site is search engine optimized, 23% claimed it is not and 29% were unsure.

Question 6

Does your business use the Internet for the following?

FIGURE 20



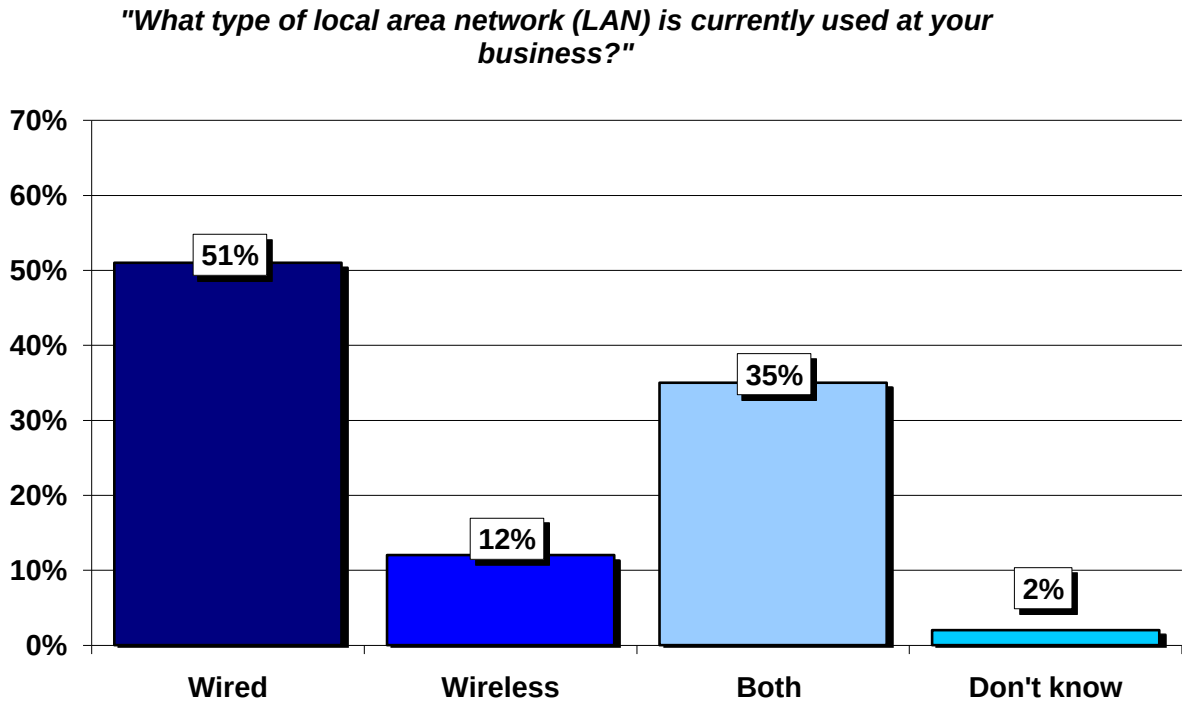
The most used Internet-based marketing tools are email (18%), and banner ads (14%), followed by in-text advertising (9%) and affiliate programs (8%). Least used tools were Web 2.0 and RSS feeds (5%)

A total of 21% of respondents with internet access also make use of social media and networking applications or technologies. Among those organizations that use social networking, 21% use MySpace, 57% use Facebook, 44% use Blogs, 44% use Forums, 25% use Twitter, 21% use LinkedIn and 15% use YouTube.

Question 7

What type of local area network (LAN) is currently used at your business?

FIGURE 21



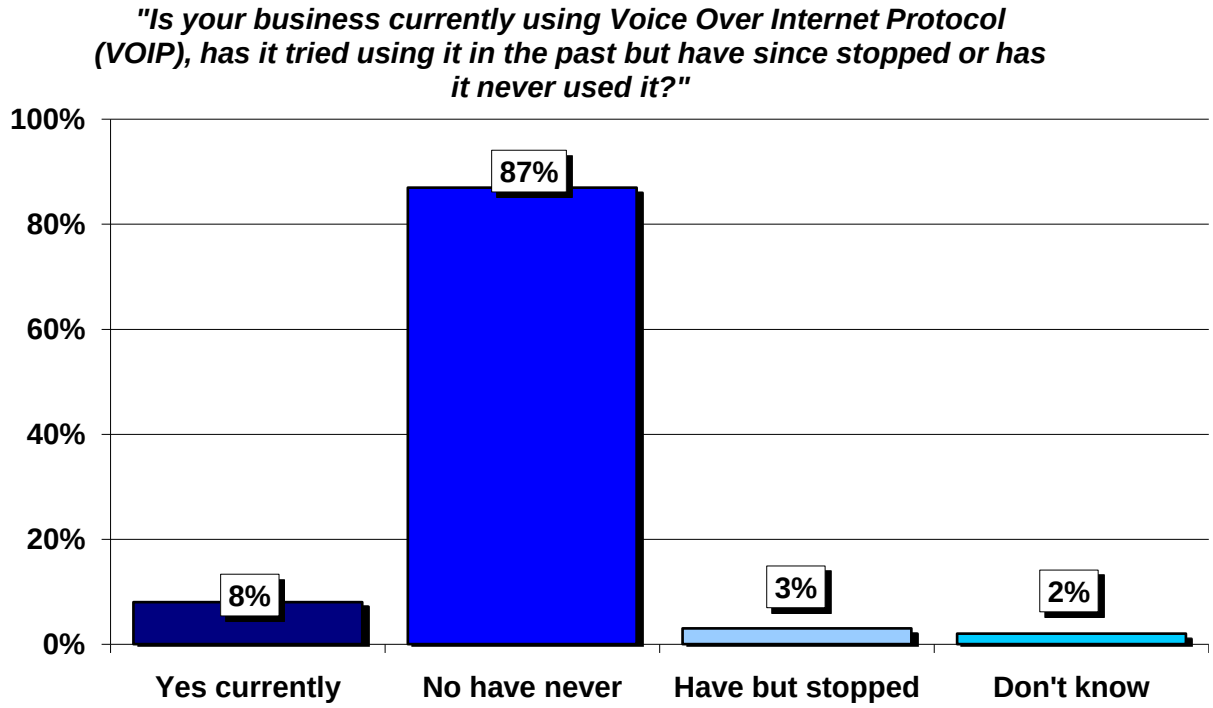
51% of those with Internet access have a wired connection, 12% wireless and 35% both wired and wireless.

The 86% that have a wired/both connections were asked what security precautions they have implemented. A total of 33% have password protection, 32% firewalls, 13% physical protection and 11% MAC filtering address. These results are similar for those with a wireless connection/both, the exceptions being that, in the latter case 21% use wireless encryption and 9% MAC address filtering.

Question 8

Is your business currently using Voice Over Internet Protocol (VOIP), has it tried using it in the past but have since stopped or has it never used it?

FIGURE 22



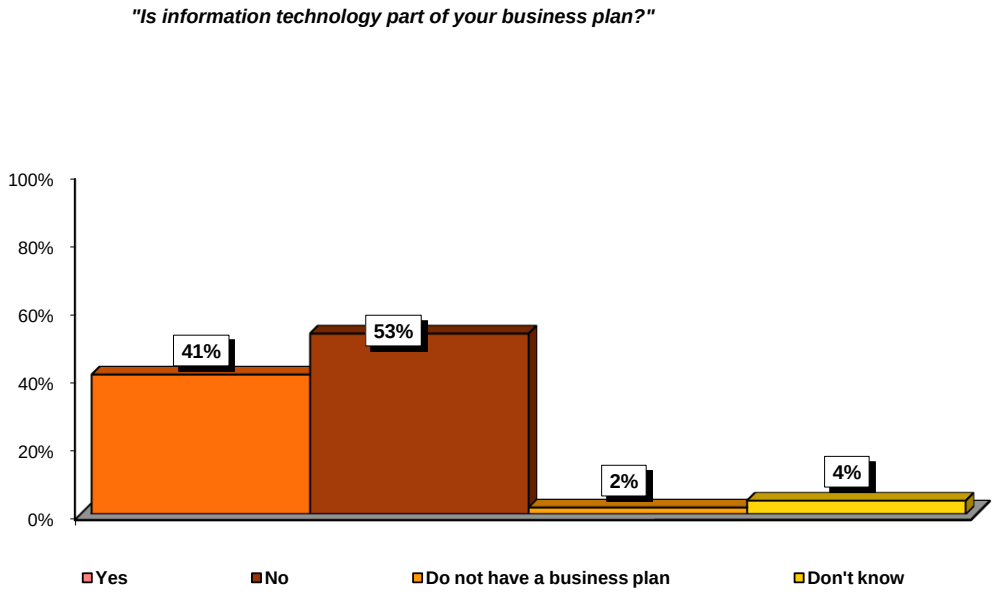
Most or 87% have never used VOIP, 8% are currently using it and 3% have used it in the past but have since stopped, while 2% were unsure. The majority of those using VOIP are doing so to compliment traditional phone service (67%) while only a relatively small percentage (29%) were using it to replace traditional phone service.

Of those not using VOIP, 22% indicated that they would consider it, while the majority (69%) would not. Finally, the main reasons cited by the 3% of those who had stopped using VOIP were lack of need, voice delay, and being difficult to use.

Question 9

Is information technology part of your business plan?

FIGURE 23



The majority of respondents indicated that information technology was not part of their business plan (53%) while only 41% indicated that it was. This result is distinct from 2005 where 52% stated that information technology was part of their business plan and only 37% said it was not.

For those who have information technology as part of their business plan, it factors into this strategy in a number of ways including: marketing and advertising (23%); need for a web presence (14%); communicate with customers (11%), training/education (10%); help with finances (7%); administration (5%); to buy and sell goods (3%); and for internal communications (1%). A total of 23% did not know if information technology was part of their business plan.

Question 10

Which sector does you business fall into?

FIGURE 24

"Which sector does your business fall into?"	
Service	34%
Retail	22%
Tourism / hospitality	9%
Government / public sector	8%
Education	7%
Not for profit	4%
Industrial	3%
Wholesale	3%
Construction	3%
Health services	2%
Electricity / gas / hydro / sanitary service	1%
Manufacturing	1%
Forestry	1%
Transportation	1%
Mining	1%

The majority of the businesses that participated in this telephone survey were either part of the service sector or the retail sector. The contributions to this telephone survey by sector can be seen in the above table.

ICT TRENDS AND BEST PRACTICES

Best Practice Research Sources

To assist in the development of an ICT utilization strategy for Northern Ontario it is important to understand and identify ICT trends, best practices, tools, and utilization strategies that provide an economic benefit regionally, nationally and internationally.

A secondary source of information for community best practices in ICT for the purposes of this report was the Intelligent Community Forum (ICF), an organization which acts as a think tank to study the economic and social development of the 21st Century community. Each year, the ICF presents an awards program for Intelligent Communities and the public-sector and private-sector partners who contribute to them. The awards program has two goals: to salute the accomplishments of communities in developing local prosperity and inclusion in the Broadband Economy, and to gather data for ICF's research programs. Information on both the winner of the Intelligent Community of the Year Award and those communities that have been identified as the top seven for a given year is made available through the organizations website. A review of all available information on past ICF winners and top seven finalists was conducted to identify those success stories and corresponding best practices that were most applicable and relevant to the specific challenges faced by communities in Northern Ontario. The results of this research and the conclusions and recommendations that follow from it are presented in this section of this report.

In addition, further information has been provided by:

- Community Geomatics Centre (CGC) in Sault Ste. Marie, a division of the Sault Ste. Marie Innovation Centre (SSMIC) relating to its innovative model of community data sharing, referred to as the Community Information Utility (CIU) model.

- Confederation College, Lakehead University, Contact North, Thunder Bay Regional Health Science Centre, Group Health Centre, and the Health Informatics Centre provided information regarding Northern Ontario trends, utilization and best practices in education and health sectors.

- The recent research from the Information Technology Association of Canada (ITAC) in a report titled “Leveraging ICT Adoption: What Can Work for Business?” provided an excellent review of trends and best practices for encouraging ICT adoption in business.

ICT Utilization in Business – Particularly SMEs

Benefits of ICT Adoption and Utilization for Business

In the past decade there has been substantial research conducted to quantify and validate the benefits of ICT utilization in businesses. Outlined below is a summary of the research in the areas of raising productivity, increased innovation, new business opportunities / market access and higher economic growth and employment. It is important to consider these benefits when considering best practices to encourage adoption and investment.

RAISING PRODUCTIVITY

ICT including broadband access, helps firms develop and adopt more productive and efficient ways of working by making it quicker, cheaper and easier for businesses to communicate and exchange information with their suppliers and customers in the supply chain.[1]

A study by the Australian Department for Communications, Information Technology and the Arts (DCITA) in 2007[2] provides the following examples of how broadband can help improve supply chain management:

- Cost savings stemming from the removal of paper transactions and greater use of electronic processes such as on-line invoicing[3]
- Lower transcription errors resulting from reduced need to re-enter information from paper documents as the information is transferred along the supply chain
- Integration of dispatch and distribution data with product development data all the way along the supply chain

There is growing evidence on the size of the productivity gains which businesses can achieve using broadband. For example:

- A Swedish study by Hagen and Zeed (2005)[4] found that broadband access increased productivity by an estimated 3.6%.
- A 2004 survey by the UK Institute of Directors[5] found that since installing broadband 84% of its members had experienced an increase in productivity, 64% a rise in profitability and 61% experience cost savings.
- Analysis by the Office for National Statistics (ONS) for the OECD found that[6] :
    - In the UK a 10% increase in the broadband-internet enabled workforce increased productivity in IT intensive sectors by up to 12%.

  - Firms with one automated business link and broadband were 31% more productive than their counterparts without broadband while firms with five or more multiple links and broadband were 22% more productive than firms without broadband.
  - firms which take-up broadband early were 22% more productive and adoption strengthened this advantage

- Ovum[7] estimated that in 2005 the adoption and use of mobile wireless broadband generated productivity gains in the US economy worth some $28bn per year and led to cost savings totally some $33.1bn
- A 2007 survey of firms interviewed by Econtech in Australia found that mobile broadband led to an increase in productivity of between 9% and 23%.[8]

INCREASED INNOVATION

Broadband can help encourage greater innovation activity by helping to spread new ideas and knowledge more quickly and widely through a variety of forums including search engines, blogs and wikis. Connectivity can lead to the transformation of business models and organization structures including greater collaboration between firms, customers, suppliers and academia through virtual networks, access to other specialized strengths through outsourcing, and new ways of working (e.g. teleworking, cloud computing). Innovation is also stimulated through the development of new applications, services and content from business applications, to online services to entertainment applications.

NEW BUSINESS OPPORTUNITIES/ MARKET ACCESS

ICT and Broadband has enabled small businesses to access new markets which may not have been previously possible due to the existence of high barriers to entry[9], compete effectively with larger companies by offering niche products, and exploit the new business opportunities created by the rapid growth in e-commerce which can extend beyond national and regional borders[10]. An example of a Northern Ontario success story has been Cinevate Inc. This company develops and produces equipment for independent film-makers and has successfully reached an international market by utilizing an Internet driven communication and e-business strategy.

Gearing businesses more towards e-commerce can help firms achieve cost savings and efficiency gains through the transformation of their business models and processes and organization structures with greater automation. For example, a study by NIESR (2005)[11] suggested that e-commerce had a large and positive impact on productivity in the UK.

HIGHER ECONOMIC GROWTH AND EMPLOYMENT

At the firm level, broadband can help contribute to productivity growth and reduced barriers to market entry and expansion. At the economy-wide level, this can lead to higher levels of economic growth, employment and prosperity. For example:

- A study for the European Commission estimates that broadband contributed on average some 0.71% to EU GDP in 2006[12]
- According to Act Now, the roll-out of broadband in Cornwall has generated an estimated 4,300 new jobs since 2002 in the region and added around £125m to gross value added[13]
- A UK study on the impact of the on-lincolnshire initiative[14] found that increased business take-up of broadband has a positive impact on firm-level turnover and employment
- Katz and Suter (2009)[15] also note that studies suggest that increased broadband penetration can lead to increased employment. While there is some uncertainty over the size of the increase in employment – due in part to a substitution effect of capital and labour – the general conclusion is that firstly, like other forms of ICT, the size of the employment effects should increase over time with broadband tending to have a greater impact on employment in particular sectors: education, health, manufacturing and financial services.

As outline above, the utilization of ICT can be an enabler of innovation, productivity and economic growth in all sectors of the economy. It is also recognized that the adoption and use of ICT by Canadian businesses lags behind other competitive countries. According to Canada's Science, Technology and Innovation Council, Canadian businesses have a 33% gap in the investment in ICT compared to their US counterparts[16]. As adoption of ICT in Northern Ontario businesses is comparable to the rest of Canada,[17] it is important to consider possible support mechanisms to encourage adoption.

Mechanisms to Support ICT Adoption

Globally, there have been many diverse programs, policies and measures attempted and implemented to encourage ICT adoption among businesses. Many of these strategies have focused on adoption by small companies. In January 2010 the Information Technology Association of Canada (ITAC) published a report called Leveraging ICT Adoption: What Can Work for Business?[18] This report has been utilized as source of information as it provides an excellent summary of international initiatives and best practices. The report reviews measures of other OECD countries and indicates that ICT adoption tends to be supported by governments through the following methods:

- Through the tax system: chiefly through accelerated depreciation allowances and only rarely through tax credits

- Through direct assistance programs (grants and subsidies) aimed at assimilation of ICTs into companies
- Through procurement programs in which government is the main procurer of ICT innovations but the users are companies in the country
- Through building receptor conditions for take-up of ICT investments at the firm level – e.g. training and skill development, management technique and organizational change.

As tax incentives are usually implemented on a national or provincial level and this report focuses on regional strategies, tax incentives will not be discussed in detail.

Direct assistance programs include grants or repayable contributions. Research into best practices for encouraging and supporting technology implementation indicate that there are few programs that specifically target IT or technology adoption as most programs focus on stimulating innovation through research and development. An excellent example of this is the Industrial Research Assistance Program (IRAP) run by the National Research Council. The IRAP program has been very successful in promoting development of new technologies but does not focus on adoption and utilization of ICT by SMEs.

There are a few countries where their direct grant-based programs focus on ICT adoption. In Belgium-Wallonia they have a program that supports SMEs to hire an external consultant to integrate e-business strategies into their business. The consultant works with the business to develop and define the strategy and source the suppliers and even oversee the project. The consultant does not actually do the IT development. The grant covers 80% of the consultant's salary (up to $7,700 CAD per month). This program also supports the development of e-business websites.

Voucher programs are also popular in many countries. They offer businesses a voucher to purchase innovation services (primarily focused on R&D) from eligible institutions (universities and other research institutions). These programs have a broader focus than ICT but work to engage businesses in relationships with sources of innovation. The voucher system minimizes paperwork and bureaucracy. On average the administrative burden of the innovation voucher has been estimated at 30 minutes work. This type of incentive has grown in popularity and where it has been evaluated it has been successful. The ITAC report[19] indicates that "among the 12 countries examined in this study – six (Austria, Belgium, Denmark, Finland, Netherlands, and the United Kingdom) have instituted low cost programs providing vouchers for purchasing of knowledge and innovation expertise. Similar approach could be taken to offer vouchers for adoption of new technology. As the adoption of technology is very much dependent on firm's absorptive capacity (developing IT skills of employees, nurturing ICT champions, etc.), voucher programs can help underwrite the initial cost of building such capacity and investing in ICTs in firms."

Government and Larger Industry Procurement – Influencing the demand for innovation and ICT products and services can stimulate adoption in the SME sector. Both government and larger businesses and organizations can be an important in stimulating business demand for innovative products and services. With a larger customer the SME can invest in R&D and technology and enhance adoption. These large organizations act as launching customers and can lower costs and provide feedback or test beds for new development. Many countries have used procurement policies as a lever to stimulate demand. In some cases the government becomes the purchaser of technology that will ultimately be used by private organizations and consumers. Examples of this can be seen in the development of new information technologies in the health sector with the end users being health practitioners. The government can also become a partner with the private sector in procuring technology. Involvement in the early-stage of technology or innovation development and adoption reduces risk and allows for market entry. Europe has been developed a successful program called the SME Pact, where the government seeks voluntary commitment from large companies and government agencies to collaborate with SMEs on innovation development projects. The Pact program attempts to address the difficulties that small firms face in landing procurement contracts. By creating a commitment and mechanism to support and involve SMEs in the strategy, development and delivery of new innovative technologies tangible benefits occur as capacity grows.

Access to ICT Skills – The access to talent and skills to adopt and utilize ICT is a key issue. The need for human resources with a combination of skills that include ICT is growing. Companies are seeking multi-skilled employees with diverse backgrounds, with demand increasing for those with both business skills and ICT background. Some countries are supporting the skill development through tax incentives for training. Training and education could be supported through direct grant-based programs as outlined above.

Beyond skills training, many feel that the core issue surrounding ICT adoption in SMEs is the lack of strategic planning especially planning that incorporates innovation and technology adoption. Internationally, there have been programs that attempt to support business strategy development. Ireland's Business Offer of Enterprise, provides financial support to cover some of the costs of training and/or business advice for small companies to initiate the process of adopting innovative business practices.[20] Denmark has also recently introduced a program through their Innovation Centre for e-business (IBIZ). The Centre provides guidance for small business on how to adopt ITCs into daily business, including organization and management and incorporation into the overall business model.

The Canadian Chamber of Commerce's recent report on small business use of e-business[21] states that – even though e-business has proven to be a significant driver of economic success, Canada still could be doing more to spread the varied uses of ICT. They recommend that Canada utilize best practices from other leading nations in establishing a National ICT adoption strategy to advance the adoption of ICT

with a special focus on SMEs. They also advocate for the allocation of resources for investments in ICT and make ICT adoption and use a government priority.

It is clear that many countries have adopted national strategies and priorities as part of the best practices but this does not preclude the potential for regionally driven initiatives that effectively impact adoption and address regional realties. The need for direct assistance to support SMEs in:

- Recognizing opportunities for beneficial ICT adoption and creating strategies and business plans to seize these opportunities;
- Implementing ICT strategies in their businesses;
- Developing human resource capacity to successfully benefit from ICT opportunities;

Additional enhancement of the ICT sector in Northern Ontario could occur through collaborative projects with larger organization and supportive procurement practices.

GIS Platforms

Information within so many public and private sector organizations has a geographic component to it. The challenge has been how to understand and interpret this information in a way that can add value. As such, there are numerous benefits for geospatial technology that can support decision making and analysis. Geospatial thinking is becoming increasingly important as more organizations are recognizing the competitive advantage afforded by implementing systems that support the rapid processing and analysis of high-volumes of information. Expanding and maintaining the use of GIS technology throughout Ontario and the rest of Canada is going to be critical to future growth and development.

At the forefront of this new paradigm shift is the Sault Ste. Marie Innovation Centre (SSMIC), which was created in 1999 to serve as a catalyst for regional economic growth in information technology and knowledge-based industries. Operating as a non-profit, public service organization, SSMIC has carved out a niche as an information leader and pioneer in sharing, integrating and analyzing public information and spatial data. Its award-winning community information utility (CIU) includes one of the world's most comprehensive community-based geographic information system (GIS), comprised of over 60 community partners (municipal government, utilities, health, social services, education, emergency response and economic development agencies) and thousands of data layers that support, amongst other things, community planning, development and investment decisions. The CIU is a powerful tool, used to advance community quality of life, strengthen the economy by growing existing businesses, attract skilled workers and new investment and improve information exchange, collaborative decision making and government service delivery.

The development of the CIU began with the formation of the Community Geomatics Centre (CGC) as a division of SSMIC. The CGC was initially conceived to help promote SSMIC's mandate to develop an Integrated Community Geomatics System (ICGS) which served as a large scale, multi-enterprise geographic information system (GIS) solution for the municipality and the public utilities commission of Sault Ste. Marie. The model that was developed succeeded in implementing a single shared solution involving external GIS consulting firms providing knowledge transfer to local staff to seed GIS expertise in the community.

A powerful use of the GIS platform is identifying economic development opportunities and serving the information requirements of businesses looking to locate potential operations in a community. The level of detail provided through the CIU has enabled SSMIC and the Sault Ste. Marie Economic Development Corporation staff to attract significant new business opportunities within the region. The key to this success has been faster response times to proponent queries and increased level of detail and accuracy in dealing with site selection specifications. A simple example is the consulting work SSMIC has done with Pod Generating Group in identifying appropriate land for its solar generating facilities. Utilizing criteria supplied by Pod Generating, SSMIC was able to quickly locate available land that was suitable for solar farm development. Criteria included: proximity to municipal grid infrastructure, specific types of electrical lines, proximity to sub-stations, slope of land, access to water, access to sewer, access to fiber, distance or proximity to truck route, useable area of land, proximity to residential areas, workforce demographic etc. SSMIC was able to quickly identify options for the company to assist in their decision making process.

This model that SSMIC has developed is unique in the way it serves the community and SSMIC has received numerous awards including, most notably:

- URISA 2009 Best Public Sector GIS
- 2008 International ESRI Health GIS Communication Award
- ESRI 2007 Special Achievement in GIS Award (Health and Human Services)
- ESRI 2006 Award of Excellence
- URISA 2003 & 2006 Best Municipal GIS Award
- URISA 2006 Leadership in the Field of GIS
- URISA 2005 – Silver Award – GIS Leadership in Ontario
- ESRI 2002 Business Partner Award

Leveraging its comprehensive municipal GIS solution, SSMIC has made numerous presentations to community organizations to demonstrate the power and potential of the community's advanced GIS system. The result has been increased collaboration with a number of health, and human services organizations. These organizations previously lacked the resources (financial and technical) to implement a GIS system, but, as a result of implementing the model developed by the CGC, these organizations are now able to view their data in new ways which serves to provide them with additional insight into the needs of their stakeholders. As such, the GIS platform provides an avenue for multiple agencies to collaborate and share appropriate information in new and innovative ways and SSMIC is continuing to expand and provide the framework for other areas throughout the Canada and the world to model their GIS solutions after.

There is an opportunity for Northern Ontario to develop an advanced GIS network that would make it one of the "smartest" jurisdictions in the world. By creating a tiered GIS network, large and small communities can play a proactive role in capturing local data that can be analyzed and used for improving the efficiency of municipal operations, health and social services and economic development. Further, this network would help to generate new, skilled jobs across Northern Ontario and enable regions to work together to foster prosperity.

Green Data Centres

As the world moves further into a knowledge-based society relying on generating and storing data, the mediums in which we store our data never seem to be large enough. Even as we go through a recession where large scale layoffs, expenditure cut backs, and frugal budgets have become the norm, Data Centre operations have remained largely unchanged. Companies often seek out the use of data centres to take advantage of the many benefits they receive from such a facility. Many organizations rely on poorly designed server closets that have little consideration for reliability, connectivity speed, power consumption, and the environment. Green data centres are built to eliminate these issues so operations can run smoothly. Typically, data centres fall under three categories: virtual private server, dedicated hosting, and collocation centre. Options do exist to promote greener technology such as charging more for added power consumption and selling discounted power efficient servers. Both of these methods together can lead to a greener solution.

There are far reaching benefits of locating data centres in areas where cooler climatic conditions are prevalent such as Northern Ontario. As servers become more numerous and densely packed, more energy is needed to maintain an acceptably cool temperature in data centres. In fact, large data centres can rival heavy industry in the levels of energy consumption and as a result can be costly to operate. For example consider the recently opened $500 million Microsoft Data Centre in Chicago, which will require three electrical substations to power with a total capacity of 198 megawatts.[22] The rising cost of energy has become a key consideration in site selection decisions, as evidenced by the

numerous data centres that have opened in Quincy. This location is close to the Columbia River and has abundant capacity for low cost hydro-electric generation. Similarly, Google has chosen to construct a new data centre at The Dalles, a hamlet across the Columbia River for similar reasons.[22] As a result of need to minimize the cost of consumption, data centres are beginning to be constructed in areas where there is not just an abundance of low cost energy, but also a naturally cool climate to maintain facility temperatures.

Since data centers draw enormous amounts of energy regardless of whether they utilize power efficient technologies or not, many newer data centers have sought to implement clean energy initiatives. Solar, wind, and hydro-electric power are examples of renewable sources that are being used by data centres that want to become more "green". Using renewable energy enables these data centres to harness power from sources that do not deplete and have no harmful exhaust emissions thus reducing their environmental footprint. These beneficial attributes result in "green" data centres being particularly attractive investment opportunities to the growing number of investors committed to sustainability. Examples of data centres using or planning to use green energy can be found in Appendix 3. Green energy, with all its positive attributes, does have drawbacks that must be accounted for. These disadvantages can be found in Appendix 3. As technology advances in the years to come and prices drop these shortcoming may slowly dissipate. There's also the possibility of newer green technologies that may become available.

The criteria that companies use to select data centre site locations is constantly evolving. For instance Microsoft has begun to incorporate a heat map into their decision making whereby areas that are hotter and therefore less desirable show up in red while those that are cool and hence more favourable appear in blue.[22] The availability of low cost energy as well as renewable alternatives will continue to play a key role, as will the local tax breaks and government incentive programs. Increasingly companies will consider the legal environment as countries move to tighten up their domestic privacy policies. For example, SWIFT, the bank transfer consortium, recently decided to locate in Switzerland rather the U.S. to avoid the possibility of having the European data that they collect subject to subpoena by the U.S. government.[22]

As briefly discussed above, data centres provide users/businesses with a reliable source of computing power and data storage. They are designed by industry professionals with the intent to eliminate down time, provide a safe a secure home for sensitive data, process large quantities of data, and act as an endless storage facility for one's data; luxuries many organizations can't afford on their own. The cost for an organization to build such a comprehensive facility with multiple means of power, cooling, fire suppression, and exceptionally fast networking connection is a large expenditure that organizations rarely seek to incur. A localized data centre would allow businesses to focus on its core competencies and eliminate the headaches server closets bring to an organization. Another issue a data centre helps solve is data security. Data centres are known for their elaborate security measures that usually go far

beyond any measures most companies would undertake themselves in isolation. These measures include strictly controlled access to server rooms, reinforced physical infrastructure, and state of the art fire suppression systems. These undertakings are often a costly expense that few businesses are able to pursue on their own. Without these precautions in place businesses stand to lose critical data that is imperative to its functioning (emails, reports, etc…) or have highly sensitive data stolen by an individual outside the company or by a rogue employee. For many reasons data centre infrastructure is an important asset in supporting ICT utilization and developing a regional ICT cluster.

It is well known that traditional computer servers are not particularly environmentally friendly. Their massive energy draw amassing from server consumption and cooling is deemed to be unsuitable as social and political influences shift to find more "green" solutions. Leveraging data centres to house a plethora of servers has immediate environmental benefits. Of the green initiatives currently being practiced most focus on the biggest and perhaps most problematic issue facing data centres, namely energy consumption.

Web Portals

A simple definition of an Internet (or Web) portal sees it as a special Website designed to act as a gateway to give convenient access to other related sites. More specifically, a Web portal is seen as a special Internet (or intranet) site designed to act as a *gateway* to give access to other related sites.

Community portals are often set up by community groups or are sometimes based around particular group interests such as the needs of those seeking to immigrate to a community (ex. Sault Ste. Marie's immigration portal discoverthesault.ca and http://www.immigrationnorthwesternontario.ca) or those who are new arrivals to an area (ex. Sault Ste. Marie's portal NewtotheSault.com). Regional portals are a special type of community portal that are centred on specific geographic areas. They provide the advantage that participating businesses are not only reaching out to potential customers, but that they are contributing to their local community and thereby building social capital. Web portals effectively create online communities allowing citizens to openly discuss their thoughts and beliefs with others in their respective area(s). Such online communities can help give citizens a voice on events, developing stories, major issues, etc. where they may not have otherwise had the opportunity.

Community and regional web portals provide numerous benefits for both citizens and governments. For instance, they can drive more traffic to community sites they link to. This is especially the case when they are combined with RSS feeds. The notion that web portals can actually serve to drive traffic to community sites effectively eliminates the argument from opponents that web portals may take traffic away from these sites. The reason behind this is that web portals serve to centralize RSS feeds from other sites in the community or region. In fact RSS feeds increase traffic at the sites that

publish them and make it easier for residents and visitors to find out what's happening locally and regionally.

They can be used both for tourism and attracting skilled workers to a given area. As community web portals make more inclusive use of information than traditional sites they often score higher on search engine rankings as a result. Scoring highly on various search engine rankings and also the location of the community/region in that ranking is extremely important for tourism efforts as this helps drive traffic to the site initially. As a recruitment tool web portals can be used as a means to attract knowledge workers and those seeking a change of lifestyle (promotion of small town living). This can be said both of business owners and potential entrepreneurs. Repatriation of those who have left the community/region may be possible as web portals can provide an effective means for these individuals to essentially reconnect and stay up to date with local events and opportunities. However, if the site is not kept up to date, it can actually have negative implications for the community's ability to attract knowledge workers. As such they are critical components of a community/region's economic development toolkit. Effective web portals project the image of a dynamic and connected community (tech savvy/ready workforce and informed citizenry)

Marketing and tourism can be extremely important for communities and regions particularly those in Northern Ontario. Web portals serve to effectively market communities/regions across a variety of different interest groups, which serves a twofold purpose. Firstly, it informs residents and businesses of current events and activities as well as shopping and commercial opportunities. Secondly, it allows those from outside the community/region to learn more about its unique features. With this latter point in mind, it especially important that the web portal be of the highest quality to be effective as it is what presents the community/region to the rest of the world. Furthermore, within communities/ regions themselves, effective web portals can help build social capital. They do so by facilitating information sharing among organizations and providing a medium by which citizens can be informed. The inclusion of such features as a community calendar, aforementioned RSS feeds, blogs, and automated reminders among others can all help maximize effectiveness.

Integrated web 2.0 technologies within the portal may enable many in the community to acquire new skills. They do so by using the community/ region's web portal as an interactive, hands-on learning tool. New skill sets derived from using the web portal can make residents themselves more marketable, and, as a result, the community can become more attractive to businesses. This because the new skill sets acquired increases the local talent pool of skilled workers a major factor for businesses to consider when deciding where to locate.

Perhaps the most important aspect of in the development of a strategy for building better community/regional web portals is to constantly innovate. This commitment to excellence extends and amplifies the portal's relevance. It also demonstrates to users that the community/region cares about

how the portal works for its constituents. As such, it is important to continually listen to key stakeholders whether by conducting focus groups or using more widespread surveying methods the goal remains the same, to find out what users want.

An excellent example of a community web portal that exemplifies the above characteristics is Portland Oregon which was the recent recipient of the *Municipal Web Portal Excellence Award* by the U.S. Municipalities E-Governance Survey. The City's PortlandOnline website (www.portalandonline.com) "allows citizens to pay utility bills and businesses to get a license and pay taxes online. PortlandMaps, it's online GIS system; allows visual access to city neighborhoods, including demographic data, crime statistics; transit and bike routes; permitting activity; schools and parks; businesses and capital projects among other features".[23] City of Portland bureaus also use blog, comment, survey, and polling capabilities of the City's content management system to facilitate 24/7 interaction with the public.[23]

Among finalists of another major award for municipal web portals, the *Best of the Web*, several themes emerged this year including prominent links on the home page to e-government services and their high placement in search engines. Similar to the City of Portland, enabling citizens to pay a department of motor vehicles bill or water bill without the trouble of sleuthing for the individual agency's Web page also was a key factor associated with web portal success as well as the inclusion of social networking platforms such as Facebook and Twitter.[24] All of the finalists based their portals on citizen preferences derived from systematically collected data. The winner this year, Virginia Beach, went one step further by developing a common content management system for seven sites that it manages linking them together through its portal.[24] With this development users can now find information through the portal without having to separately navigate each of these sites.

Integrated Online Entitlement Cards

While some areas have made strides in implementing web portals that act as information gateways for residents, few cities have rolled out a fully integrated online solution with a complimentary entitlement card. City residents normally need to interact with city workers to perform such activities as paying parking tickets, reporting incidents, and making other requests. This interaction leads to travel costs, time wasted, paperwork, human errors, and missed deadlines by city employees. A group of cities have expanded their abilities to streamline many routines online. Citizens now have the ability to pay, report, request, submit, and download a wide range of items from home, at work, or on the run without the hassle of visiting a municipal government office building.

What is just as impressive is the acceptance that some of these systems have received. The city of Dundee, Scotland city council website is an example of one that has gained tremendous popularity with residents. For instance, 32% of residents have utilized the site's online services and have given overwhelming support for the site granting it a satisfactory rating of 86%. This high rating resulted in

over 60,000 transactions and the collection of over $16 million (U.S.) through the website. These statistics were from 2007 so one can presume that these numbers have increased over the last few years.

Behind the municipal web portal is a comprehensive citizen database system that collects a wide variety of information, with individual approval of course, and uses this data to provide statistical information to back office staff and also allow users to pre-fill out forms with their on-record information. Some of this data was captured via the web interface and other data was captured through a Discovery Card in Dundee. The Discovery Card idea was a one card solution for residents that allowed them to eliminate the majority of the cards they used on a daily basis. 10 card-related services in the city now accept the Discovery Card to access their services, further eliminating the need for residents to carry a large variety of cards. With high usage rates from those 12-18yrs old and 65+ (87% and 85% respectfully) they and many others were using the card for free bus services, meals, leisure access, parking to social services and other programs. This popularity led to 44,000+ cards issued in 2007, a figure that quickly gained notice with government officials. They were so impressed that a nationwide card was soon implemented.

The Discovery Card evolved into the National Entitlement Card (NEC) which is now used throughout Scotland and includes additional services such as bus travel. A new feature can be added to the NEC card, if the user wishes, that enables buying power. This feature named sQuid allows enabled NEC cards to hold a monetary balance thereby allowing users to make small purchases at participating locations across the country. When users need to top up their balance they can simply go online or visit a participating vendor with their sQuid enabled cards. For those not interested in obtaining a NEC card or wish to have a purchasing card separate from their NEC a separate sQuid card has been created. This card is solely used for small purchases at participating vendors without any additional features. It also has the ability for the user to add additional funds when they see fit. These examples are just the beginning of the infinite possibilities an integrated online portal and entitlement card can help simplify the daily lives of Northern Ontario residents. Overall, the main goal is to add to the quality of life of the citizens residing in the region.

Such a comprehensive solution as this has many widespread benefits for citizens and governments. For citizens, it provides them quicker, easier access to government services than their typical means. Furthermore, it provides a new age on-demand service that enables lower income homes the ability to purchase bus passes the night before their old pass expires, allows handicapped individuals the freedom of paying city taxes instead of going through the hassle of taking cumbersome trip across town, and enables those with parking tickets to pay them online instead of competing against heavy snow fall conditions. For governments, on the other hand, a system such as this generates a significant amount of traffic flow to the community web portal. This traffic creates a real opportunity for governments to reach out and connect with their citizens in a far more interactive way than previous

media outlets. Using Internet capabilities, a web portal can quickly deliver important information, collect feedback, ask citizens important questions, display videos and other citizen-directed approaches. As technology advances and newer uses for the internet become developed, web portals will be able to further expand its service offerings.

Tourism Card

Similar to the Dundee's entitlement card that has been developed, a similar card technology has been developed for tourism. Such a system has been developed by Leisure Pass Group that enables travelers to use a card to access a wide variety of selected attractions while providing special offers and use of additional facilities. The pass card can include free local public transportation and provides a free copy of a comprehensive guide book. The Leisure Pass Group has worked with cities such as London, England; New York, USA; and Paris, France. In total, the company has been responsible for over 4 million visits to attractions.

What abilities can such a system have? Such a system will be able to do a magnitude of things. The obvious benefit is to enable visitors with a simple means to visit popular attractions through a pass-card system. Another important incentive of such an integrated system is the ability of attracting new revenue streams to a regional tourist industry. The system will also facilitate more visits to local attractions by exposing tourists to a variety of tourist hot spots instead of them visiting a small handful. For instance, a family of tourists visiting Thunder Bay, on average, may check out 3 destinations without utilizing a tourist card. But when such a card is present the family of vacationers will be more acceptable to make time available and visit additional tourist destinations.

Tourist cards provide a powerful managerial interface for those running the system. It enables instant management of information and a comprehensive contact database. These systems offer the ability to manage attractions with location specific data capture methods, with key figures and statistics such as usage rates, profitability of product lines while creating invoices for attractions and sales agents.

A great example of a Leisure Pass Group system that was implemented is the Stockholm Card in Stockholm, Sweden. Initially they attempted such a system that was a paper trail nightmare with numerous systems to manage. It was generally a headache to administer. The Leisure Pass Group was able to streamline this process through one simple system. Now the system operators know exactly where all their cards are, have the ability to track profitability by sales channel, agent, or even by each individual traveler. This new system has allowed participating businesses and organizations to focus on increasing profits.

Community Wireless Networks

Community wireless networks are those that are used to connect residents and businesses with one another. To accomplish this, community wireless networks provide a common point of connection to the Internet through a wireless Internet Point of Presence (POP) or gateway, or even by connecting through wireless networks located in nearby areas.[25] As such, wireless networks allow those within a community to connect and use the Internet just as they would if they had a hard wired connection. Furthermore, wireless networks can also be used to connect branch offices and to bridge distant communities.[22]

Taipei, Taiwan has recently deployed a community wireless network with great success. The project was initially conceived as the Cyber City program and was successful in its efforts to provide "free PC and Internet training to 240,000 people and established 800 public Internet kiosks throughout the city".[26] In its second phase, Taipei focused on several new priorities that involved the "development of a municipal wireless network to mass transit stations, and all elementary and middle school campuses where each campus was equipped with its own Web site to facilitate teacher-student communications. The city has ambitious plan in place to expand the wireless network it has created to encompass 90 % of its geographic area".[26] As a result of its efforts, Taipei was awarded as the prestigious Intelligent Community of the Year award in 2006.

Another ambitious wireless community initiative was undertaken recently by Tiajin, China. The goals in its current five-year plan are "to provide broadband access in 100% of the 12 km^2 (4.6 sq. mile) city, have 80% of households own a PC and 55% of residents become Internet users, and have total broadband penetration reach 60%. Collaborating with telecom carriers, cable TV companies and equipment manufacturers, the city has deployed 20,000 km (12,500 miles) of optical fiber in multiple interconnected networks".[26] A newly completed telecommunications hub in Tianjin provides switching and control for networks that connect the nine provinces of northern China.[26] Tianjin has been particularly successful in bridging distant communities through its wireless initiative. In this regard the city recognized that it contains large rural areas where farming is the predominant industry and established "village to village" program which has, with help from satellites, connected nearly 4,000 villages to the Internet and has helped to transform rural life.[25]

Establishing designated wireless zones throughout Northern Ontario would serve to help bridge the digital divide that exists between those who have reliable high speed Internet access and those that do not. This is a particularly contentious issue for those living in rural and remote areas. It would also serve to enhance tourism and commercial activity in the region by providing travelers (both recreational and business) with the assurance of access. Tourism could also be supported by strategically locating hotspots and Internet kiosks throughout communities to enhance levels of digital

inclusion. Visitors to such locations could be presented with a variety of information about the local community including upcoming events and places to see.

Mesh networks are the pinnacle of wireless networking. Although they should be treated as experimental at this point, communities should investigate options for making use of mesh technology as part of their wireless network deployment. Mesh networks exhibit the unique property of cooperative gain, which means that the greater the participation in the network the more bandwidth that is available.[27] This in contrast with traditional networks in which bandwidth actually decreases proportionally with participation in the network. What is particularly interesting about mesh networking for communities is that they increase the possibilities for local networks that do not have to go out on the Internet. Messages "can be passed from one node to another without the Internet ever being bothered or alerted".[27] As a result there is enormous potential for mesh networks as nodes can be set up without having to pay an ISP.[27] Thus, those within a particular geography could establish local mesh networks that would function as new platforms for social networking as well as interactions with government and other local service providers. Mesh networking is a true example of a disruptive technology that could revolutionize the way users within a community interact and collaborate.

Interactive Digital Media

Digital media draws on the best from the fields of creative content, computing and telecommunication. The digital media sector offers expertise across the entire spectrum from animation and special effects to Internet publishing and broadcasting; from post-production to video and computer games. In fact, the video and computer games industry has recently experienced rapid growth with revenues expected to top $65 billion by 2011. This industry is truly international, owing in large part to its geographic neutrality. As a result, significant players are beginning to emerge in countries located far from traditional business centres. Access to ICT infrastructure is critical for these industries as they rely on broadband access and computing power.

For instance, game development has been going on in Malaysia for over 10 years and the country boasts some very large studios as well as small start-ups, amateur groups, and hobbyists. Malaysia has laid the foundation for continued industry growth by adding game related programs to the curriculums of its major universities and launching the Multimedia Super Corridor program to help bootstrap the development of local companies.[28] The Multimedia Super Corridor is an area near Kuala Lumpur where companies can apply for 10-year tax exempt status. The program also relaxes restrictions on foreign ownership, and makes it easier for foreign knowledge workers to obtain visas.[28]

Similarly, the Brazilian game industry has been growing in recent years with 43 companies currently in various stages of game development.[28] This growth has been fueled by an increase in the industry's profile both domestically and abroad as a result of greater media exposure and the hosting of national

and international conferences and expositions. In fact, similar to the experience in Malaysia, many Brazilian universities are beginning to offer industry specific programs and it's expected that the availability of graduates with game development degrees will help continue the rapid expansion of the local industry. Finally an important factor for the Brazilian industry has been the commissioning of games based on domestic properties such as the television show *Big Brother Brazil*, as well as *Vampiromania* a title derived from a vampire themed soap opera.[28]

In Canada, Quebec continues to be the major hub for game development initiatives. This was originally the result of a government grant program that attracted Ubisoft to the city in 1996, a time when there were only a handful of independent start-ups. This has since rapidly evolved and there are currently 2000 game developers in the Province, 1000 of which are employed directly by Ubisoft, itself one of the largest studios in the world.[28]

Ontario is also making great strides in growing its domestic game development industry, recently attracting Ubisoft to locate an office employing approximately 900. Much of the growth is attributable to grant programs that have been made available through Ontario Media Development Corporation (OMDC), an agency of the Ministry of Culture, and Interactive Ontario (IO), a not for profit industry trade organization. In the North, Sault Ste. Marie is positioning itself to a be leader with the launch of *Algoma Games for Health* a not for profit game development R&D initiative affiliated with Algoma University, the Sault Ste. Marie Innovation Centre, and Toronto Rehab. The studio leverages the strength of the University's Master of Science in Computer Game Technology degree, which is the only one of its kind in Canada and focuses on the emerging market for game products that benefit those who suffer chronic disease conditions including stroke. Sault Ste. Marie has also benefitted from significant investment from Ontario Trillium Foundation to support ProtoLaunch, a series of industry led workshops targeting high school students to provide them hands-on experience and information on career opportunities in video gaming.

Another large-scale project that has recently been announced is the development of a network of business incubators throughout Ontario as well as related institutions serving the digital games community, made possible through support from OMDC's Cluster Partnerships fund. This will allow developers to locate the best resources through business incubation centres and accelerator programs regardless of their location in the Province. The network will also leverage the research expertise of educational institutions, promoting skills training and employment opportunities to graduates.

In addition to the gaming sector, other areas of digital media have seen growth and development. Northern Ontario has a burgeoning independent film production sector that is capitalizing on the accessibility of digital technology. The industry in Thunder Bay boasts over 12 companies (many award winning) and substantial list of experienced talent from producers to screenwriters to camera operators. In 2009, Confederation College began offering a one year Post Diploma Program in

Animation Production. This is complimentary to their Film Production and Multi-media programs. The digital media sector requires strong ICT infrastructure and will be a growth engine as ICT applications and interactivity grow and develop. This sector is important for youth retention and distance collaboration.

Health Informatics

Northern Ontario has the capacity to become a model jurisdiction for the implementation and use of advanced health information and communication technologies. Indeed, in a region with such a huge geography and widely dispersed population this is a necessity for the effective delivery of health care services. This necessity can be a driver for economic development opportunities as referenced in the Growth Plan.

There are a number of strategic reasons why it makes sense for the government to invest in health informatics projects and research. Northern Ontario has an impressive track record for innovation in the healthcare field and possesses some unique characteristics that no other community in Canada can claim:

GROUP HEALTH CENTRE

- Electronic Medical Records (established over 10 years ago)
- Online Patient Portal - My Health Matters (some of Canada's first patients to have secure access to their Heath records on-line)
- Canada Health Infoway Nationally Sponsored EMRxtra Program (Canada's first system linking pharmacists to electronic medical record Information)
- Healthcare Communications and Technology Centre
- Health Informatics National Recognition and Award Winner

COMMUNITY GEOMATICS CENTRE - GIS IN HEALTH AND HUMAN SERVICES

- International GIS Awards and Publications
- Methods for Combating West Nile Virus
- Methods for Tracking Infectious Disease Outbreaks
- Methods for Syndromic Surveillance

HEALTH INFORMATICS INSTITUTE AT ALGOMA UNIVERSITY

- ESRI Canada Health Informatics Research Chair
- Health Informatics Cluster Committee

HEALTH INFORMATICS- SAULT AREA HOSPITAL (SAH)

- New Hospital with Advanced IT Infrastructure to be opened in March 2011
- Installation of the latest Meditech hospital information system
- Wait time Information System

NORTHWESTERN ONTARIO HEALTHCARE INITIATIVES

1. SHARED HOSPITAL INFORMATION SYSTEM
   - Enables the sharing of patient information between hospitals and to clinicians
   - Cost effective for smaller hospitals
   - Currently used by 12 of 13 hospitals in Northwestern Ontario
2. PICTURE ARCHIVING COMMUNICATION SYSTEM (PACS)
   - Allows the storage of medical digital media such as imaging for x-rays, ultrasounds, MRIs, CTs and other imaging modalities at one central facility
   - Provides a medium to share medical images across health institutes allowing them to be more accessible to physicians.
   - 23 sites connected to the regional PACS system

Therefore, additional investments to build on this strong nucleus of activities will help to further the reputation of Northern Ontario in this area and help to drive economic benefit to the region.

Investing in a modern health infrastructure in the North with research potential for medical practitioners would also assist in the recruitment of health professionals to Northern Ontario. This is an important benefit of such an investment and would address a major issue for the North.

Education Sector

Northern Ontario Initiatives

Education has always been a driving factor in Northern Ontario despite the challenges of having such remote communities. With four universities, 6 colleges and other learning initiatives such as Contact North/Contact Nord servicing just over 800,000 km^2 and a population under 750,000, ICT technologies were required to enable the maximization of educational services.

Confederation College is currently doing some interesting learning initiatives that have been enabled through the broadband expansion initiatives throughout Northern Ontario. This new high-speed information highway has allows the college the ability to implement new products such as “Virtual College”. The Virtual Class application allows students to individually connect and actively participate in live, interactive classes from the comfort and convenience of their own homes. Not to be confused

with eLearning, Correspondence, or other asynchronous models, Virtual College is a synchronous (live) delivery that is the closest thing to replicating for faculty and students, a classroom lecture/whiteboard environment.

Another unique initiative that Confederation College had undertaken is the adoption of state of the art equipment called Globe Caster. Globe Caster delivers studio quality demonstrations that can now be delivered to any remote community that is connected. This "studio in a box" is capable of originating a broadcast of the finest of detail in a variety of applied disciplines regardless of distance between the originating and receiving sites. Rural and remote students can now witness a "better than live" presentation right in their own community thanks to the advanced features of the Globe Caster system and the availability of high speed connection that makes the transmission possible.

A recent endeavour collaborating with Lakehead University has shown great success to graduate remote students enrolled in a Bachelor of Science in Nursing (BScN) pilot program. The program delivered rich, interactive curriculum through the use of video conferencing technology and an extensive broadband network. The program had great uptake with this oversubscribed program that saw to students not having to leave their home communities for majority of the program.

As seen in the previous example, Lakehead University is also taking strides to develop distant learning initiatives. In the spring of 2004 they opened the doors to their Advanced Technology Academic Centre (ATAC) on campus designed to be a state-of-the-art technology facilities design to promote learning on campus and at a distance. The Centre houses research and teaching laboratories for technology-intensive courses in software engineering, electrical engineering, geographic information systems, and computer science. ATAC's state-of-the-art smart classroom technology has expanded distance education through greater access to video-conferencing and other distributed learning tools. The video conferencing systems utilized aren`t your typical setups. Using advanced equipment such as projectors, plasma screens, document cameras, and sound system that offers a plethora of features and options, Lakehead is making a valid argument to being a leader in delivering course material and lectures to off-campus locations.

Contact North's high speed broadband network spans throughout Northern Ontario remote communities while maintaining 94 centres. An additional 18 centres were recently added in 2009 in Eastern, Central, and Western Ontario to help students and facilitate learning. This network isn`t just is open to education and training institutes within Ontario delivering educational material from a distance. This includes such Ontario organizations as colleges, universities, literacy organizations and school boards.

There has been significant growth in the number of courses available to students at a distance across Ontario (more than 750 available in 2008 – 2009) and significant growth in the number of course registrations supported (close to 14,000 in 2008 – 2009). In Eastern, Central & Western Ontario, Ontario's colleges and universities provide access to over 10,000 online courses for students at a distance with more than 3,000 course registrations projected for 2009 – 2010. More and more students are taking advantage of the quality learning opportunities available without having to leave their community.

Contact North supports educational institutions to make the most effective and innovative use of learning technologies through leading edge technology briefings and initiatives such as the Emerging Technologies Training Program. The program is dedicated to teacher interested instructors, faculty, instructional designers, IT support personnel from Ontario colleges and universities on how to use emerging technologies to rapidly develop high quality, rich, interactive online courses and programs on a limited budget. The Program currently has more than 120 enrolled in various courses; from instructors, instructional designers, IT support staff and other staff from Ontario's colleges, universities and essential skills providers.

One of the most recent educational initiatives taken place in Northern Ontario is the Northern Ontario School of Medicine (NOSM). "The first medical school in Canada to be opened during the Digital Age, NOSM's four-year Undergraduate Medical Education e-curriculum emphasizes the use of broadband technology to bridge the distance between campuses, and to facilitate an extensive distributed learning model that is unique in modern medical education."[29] NOSM is home to two campuses at Laurentian University in Sudbury and Lakehead University in Thunder Bay and heavily relies on the use of broadband to correspond with each other and other institutes to deliver a top rate education.

International Education

The face of education is rapidly changing around the world as countries implement elaborate ICT-learning initiatives.

An exciting project that is taking place in the state of Kerala, India has caused a revolution to their educational system through the it@school project. The project affects 5,000 schools that house three million students and 120,000 teachers. Kerala underwent the world's largest simultaneous deployment of Free and Open Source Software (FOSS) based ICT education. Introducing a FOSS-based system opens the doors for a wide variety of applications at a fraction of the cost. The states Broadband infrastructure was also enhanced to supply every school with high speed internet. The it@school project also enriched their educational curriculum. Students are now required to take compulsory IT classes when at the grade 8 level. This inclusion signifies how important IT knowledge is to their students and to the future of their country.

The project has local cable operators agreeing to broadcast VICTERS, an educational channel for students, to all television sets across the state. An agreement was made for 70% of the cable companies to broadcast the channel after school hours. It created a school wiki to promote collaborative content development and every school receiving its own website.

Another interesting place to look for ICT implementation in education is Uruguay. About 5 years ago ICT initiatives in the school system was off most people's radar. The country has recently taken a unique approach to allow its students to catch up with the modern world. "Plan Ceibal" had high ambitions to put a lap top computer in every public primary school students' hands, free of charge to all students. The program was also extended to high school students and private school students as well.

Even though the "free laptops for kids" initiative was the focal point of the project, other ICT-enabling steps were taken. To complement the new availability of computing power of every student, free wireless connectivity was added to every school. Free internet connectivity was also added to hundreds of municipal centres as well. Another initiative provided complimentary educational television channel to interested students.

South Korea has also taken extraordinary steps to infuse ICT initiatives into their school system through their Korea Education & Research Information Service, or KERIS. KERIS was put together to develop human resources through e-learning, regain public trust in education, lay a foundation for a knowledge and information-based society by activation of e-learning, and to enhance national education and research competitiveness through academic digitalization. An e-learning initiative taken by South Korea is their National Teaching & Learning Center EDUNET; a comprehensive education information service in Korea. EDUNET is the best source for education information in the country for all residents but is the most useful for students and teachers. Contribution is critical with this service that sees education institutes and various levels of government providing integral information essential for educating the masses. It also acts as a virtual private tutor eliminating unnecessary tutor expenses for students and parents. The EDUNET also helps educators adapt and create curriculums through their 'EDUNET Cyber Teacher' and 'Cyber Home Learning Service' consulting service.

Another role KERIS plays within North Korea is a proponent for cultivating talented personnel, developing programs for training teachers, and researching policy on national human development. It tries to be an advocate for continuous development of South Koreas educational system. New developments provide new training guidelines to enhance and expand instructor capabilities. RISS or Research Information Service System is a service that houses source information, educational journal articles, and dissertations from Korea and abroad. The service adds to South Korea's world-class competitiveness in the field of academic research. In addition, RISS has created a cooperative network for South Korean's university libraries, and related institutions.

ICT USAGE MATRIX

Correlating the research results from Northern Ontario to the possible ICT applications for SMEs has resulted in the development of an ICT Usage Matrix. This chart provides a high level summary of the current options and an estimate of the levels of adoption. It is hoped that it can be used to as a starting point for encouraging, monitoring and support Northern Ontario SMEs as they realize the full benefits of ICT.

Application/ Opportunity	Current Adoption for Business in N. Ont*	Availability of N. Ont Providers	Benefits to Business	Target Segments
e-commerce	27%	Yes – numerous, some have their own applications, others supporting products	Increase market reach, increase sales, reduce sales cost	Virtual products (software, digital info), Manufacturing, tourism, outsourced services
Search Engine Optimization	47%	Yes – numerous sources of expertise	Increase website traffic, market awareness, sales	All businesses with a web presence
Social Network Marketing	21%	Yes – few with applications, some will assist	Increase awareness, enhance communication with customer, new messaging opportunities	Businesses targeting a younger demographic, B2C business
Online Advertising	Banner Ads – 14% In-Text Ads – 9%	Some will assist but no local suppliers	Increase awareness and traffic to website, monitor results	All businesses with a web presence
Affiliate Programs	8%	Yes – assistance available	Increase sales and awareness	Business selling online products
RSS Feeds	5%	Yes – assistance available	Allowing customers, stakeholders to “pull” current information, enhance communication	Businesses, orgs and communities posting new/interesting information
Web Portal Opportunities	Low for business	Yes	Building a larger online presence, shared - infrastructure, expense, expertise – reducing cost	Communities, clusters e.g. tourism, health
Mobile Marketing/ Applications	None mentioned	None – some applications in development	Fastest growing communication medium, technology evolving, low	Potentially all sectors

Application/ Opportunity	Current Adoption for Business in N. Ont*	Availability of N. Ont Providers	Benefits to Business	Target Segments
			cost after implementation, opportunity to geographically target	
Video conferencing	Minimal	Yes – numerous N. Ontario providers	Cost savings, increased customer and employee support, enhanced market reach	Regional businesses and organizations, business with dispersed staff or customers B2B
Online Meetings	2% mentioned adoption in last 3 years	No N. Ont providers but some will resell or assist	Cost savings, increased customer and employee support, enhanced market reach	Regional businesses and organizations, business with dispersed staff or customers B2B
CRM – Customer portal	Minimal	No N. Ont providers but some will resell or assist	Enhanced customer support and outreach, potential cost savings	B2B, service providers, high involvement goods or services
Supply Chain Collaboration Tools	Minimal	No N. Ont providers	Increased efficiency, inventory management savings, lowering costs	Manufacturers, businesses with significant material management issues
Software as a Service – hosting apps to provide customer solutions	Minimal	Few with targeted solutions and some resellers	Increased customer service, enhanced communication and efficiency	Professional services, custom products, interactive services
Location Based Services • **Fleets** • **RFID tracking**	Minimal	No N. Ont providers	Increased efficiency, better control, enhanced management and planning	Businesses with fleets, movable assets or those needing to track inventory

*Source: NEOnet Connectivity Survey 2009 for specific %s or estimated adoption levels based on focus group discussion and focus group surveys.

RECOMMENDATIONS

1. **Enhance the support systems available to SMEs to encourage adoption, stimulate growth and create a platform for ICT integration.**

   a) *Implementation of a new program designed to help SMEs leverage ICT for growth.* The objectives of the program would be to enhance the productivity, innovation, market access and growth of Northern Ontario SMEs through strategic investment in ICT projects. To do so it would target both SMEs and small not for profit organizations, thereby stimulating growth through increasing the capacity of Northern Ontario service providers to service the SME sector. Applicants would be expected to provide an ICT strategy in the context of their business or must complete an initial assessment phase to develop this strategy. Selection would be based upon a given project's potential for revenue growth, market diversification, job creation, and/or productivity enhancement. The program would be delivered on two levels:

   i) Initial Assessment - $1,000 to $5,000 – maximum of 90% of eligible costs supported through the new program.

   - The program would be designed to support SMEs with the integration of ICT principles into the planning process to enhance strategic decision making by linking ICT directly to business success. Management needs to be equipped with the tools to properly decide on the role for ICT to play in their organizations. Numerous options exist from ICT integration into every business process, product, or service to simply satisfying informational requirements. To do so management should understand the unique set of drivers that determine this decision and how ICT fits within their higher level organizational goals. These decisions can have far reaching implications for the overall value system of a business and should become part of the planning process. Linking ICT strategy to organizational goals will help businesses define the value of their ICT investments and will ensure that they are positioned to capture the competitive advantage they provide

   - To assess the business and prepare an ICT strategy that demonstrates potential for revenue growth, market diversification and/or productivity enhancement. This strategy must illustrate how this fits with the business' plans and strategy.

   ii) Implementation Support – Up to $30,000 – maximum of 75% of eligible costs supported.

- For the implementation of ICT. This can include a variety of projects depending on the business' strategy – e-commerce, internet marketing, social media campaigns, CRM, business management software, etc.

A complete listing of program details is included in Appendix 4.

b) *Encourage the adoption of Chief Technology Officer (CTO) in Residence programs to assist SMEs in adopting ICT*. CTO in Residence programs would serve to bring entrepreneurs and experienced technology executives together to facilitate coaching and knowledge sharing on technology-related issues and opportunities. This could include: the use of new and emerging technologies and tools to enable new ways of sharing information and building relationships; IT strategy; and technology planning, including security, privacy and e-commerce. CTOs in Residence would also serve to achieve the higher level goal of connecting clients into a broader network of resources, including peer learning, education, and services offered through the existing network of regional innovation centres and other community based economic development organizations.

c) *Develop a more streamlined application process for government programs to facilitate ease of use by SMEs and lower the barriers to access*. There is often a lack of understanding of what funding programs are available through the government and some confusion over the application of their guidelines based on the publicly available information. Many businesses have expressed the need for a common web-based repository of information relating to these programs with live help functionality to provide real-time feedback and support from government staff. Moreover, the funding process can be overly cumbersome for SMEs with limited resources and should be streamlined to enhance program utilization and the timeliness of approvals.

2. Attracting knowledge workers to Northern Ontario should become a key component of the labour ICT strategy for the region. It has traditionally been difficult for employers located in Northern Ontario to attract and retain skilled labour. The lack of readily available knowledge workers has been an impediment to business growth and development in the region and, in some cases, has resulted in companies deciding to relocate to major urban centres. A comprehensive strategy needs to be developed to attract and retain skilled knowledge workers for Northern Ontario to remain competitive. This strategy would include the following components:

a) *Cooperative recruitment support* – There is a need to develop a cooperative recruitment initiative where companies seeking ICT talent join together to share costs and target specific labour markets such as the University of Waterloo, the Ottawa and Toronto regions for

presentations, recruitment ads and other forms of outreach. By working together this initiative will not only reduce the cost to individual organizations but also create a much greater impact in selected markets. Recruitment could be easier with potential candidates seeing multiple opportunities in Northern Ontario.

b) *Relocation Services* – immigration portals should be further developed to enhance regional visibility to prospective workers and their families. These should provide a wealth of information about Northern communities and assist with acclimatizing those have recently relocated to benefits of life in the North. This could include information pertaining to cultural activities as well as language and bridge-training programs.

c) *Fast-Tracking of Federal Immigration* – communities in Northern Ontario should have the ability to petition the government to fast-track a limited number of skilled foreign workers through the federal immigration system where there is support from employers having difficulty filling vacant ICT positions. Opportunities Ontario and similar programs should be continued and specific numbers of nominations through such programs should be allocated to Northern Ontario.

3. Enhance educational opportunities with a focus on ICT skills development.

a) Ensuring the next generation of workers is knowledgeable of ICT begins in the education system. Programming at both the primary and secondary school levels should integrate ICT use into lesson planning and delivery. This should build on the success of pilot programs that use laptops and smart boards in classroom settings to enhance learning outcomes. Innovative new approaches to delivering education in the north can be a catalyst for sector growth and ICT utilization. Northern Ontario's educational institutions must take a leadership role in developing innovative and technically savvy graduates at all levels and in all disciplines to meet the needs of the growing knowledge economy.

b) Post-secondary educational institutions should be encouraged to develop unique programming in areas such as video game technology, animation, software development digital media and other niche sectors that have high growth potential. This would build the capacity of Northern Ontario to become a leader in these areas by having high caliber graduates that could help seed the development of local initiatives as well as setting the stage for emerging industries.

c) Complementary to this is continuing to offer strategic and focused training in Northern Ontario for ICT workers on new applications and technology. This has been successful in the past with

.Net and other IT training offered by the Innovation Centres in both Sault Ste Marie and Thunder Bay.

d) Other educational opportunities that need to exist are ICT-based workshops and seminars. The research in this study acknowledges that businesses are lacking fundamental ICT knowledge and those needing help believe that workshops and seminars are the best form of delivery. These forms of education suit the time allocation needs of business owners, managers, and lower level employees. They don't have the time available to attend educational institution courses. They prefer the quick and concise delivery methods attributed to workshops and seminars.

4. **Expand the scope of current GIS undertakings and strengthen the linkages between business intelligence and value realization for SMEs.** The market sector for GIS and other forms of spatial analysis is expected to grow dramatically. New technologies and the development of Smart Grid systems are seen as primary drivers that will require substantial network reengineering. This will necessitate the development of robust GIS platforms capable of providing for the design, analysis, and ongoing management of new network configurations. Municipalities need to become aware of the benefits of GIS implementation and ensure that they are positioned to horizontally share information and leverage this to maximize their ability to use the resultant data to resolve evolving challenges.

a) *Economic Gardening* – the fundamental premise of economic gardening is that entrepreneurs drive economies. Healthy communities are seen as those that have developed an environment conducive to entrepreneurship. This environment is one in which critical business information is readily available. GIS platforms are ideally suited to this as they can be used to determine demographics, consumer expenditures, lifestyle data and other information that can be used strategically by businesses. GIS also provides a method to visualize and conduct analysis on current and future market trends. Offering free or very low cost business and market analysis through GIS platforms.

b) *Community Information Utility* – this term was coined by the Sault Ste. Marie Innovation Centre Community Geomatics Centre (CGC) to describe their unique model of geospatial information sharing. This model is unique in Canada, in that it promotes and establishes the partnerships and technological means to efficiently share geospatial data, tools and knowledge amongst community organizations to create safer, healthier and more prosperous communities. It has been designed to be replicable in other communities so that they may learn from and share in the success that it has brought to Sault Ste. Marie. Models such as this can serve to function as effective tools for economic gardening by creating centralized hubs of information that can be

leveraged to generate customizable reports to provide strategic recommendations for businesses.

5. **Engage IT organizations with the larger business community to ensure alignment of core products and services with market demand.** Competitive advantage is derived when local pipelines exist for the application of information and communications technologies to business processes. Market intelligence needs to inform the product market strategies of ICT companies that should be encouraged to cluster together to leverage inherent symbiotic advantages. This is best described as a form of opportunity management creating the capacity for innovation. The principle dimensions of this include:

   a) *Relationship Management* – the engagement between ICT companies and the business community. A common observation is that companies do not know what products and services ICT companies provide and have difficulty identifying those that are best equipped to suit their needs.

   b) *Cluster Development* – the process of seeding and unearthing opportunities for ICT companies to develop synergies that serve to enhance business value and to further enlist the interest of the business community.

   c) *Innovation Centres* – a proactive strategy towards innovation should be taken through the adoption of new technologies and processes, as well as the reimagining of existing practices to give rise to new business opportunities is a key success factor. The resources of current centres should be enhanced to create a strong regional network leading to a pan Northern Ontario approach to the management of innovation.

   d) *Procurement Initiatives* **–** Create a Northern Ontario ICT procurement initiative that creates a commitment from all levels of government and large businesses operating in Northern Ontario to facilitate Northern Ontario SMEs' participation in ICT development projects and products.

ABOUT THE PARTNERS

Sault Ste. Marie Innovation Centre

By developing innovative partnerships with industry, government, and other public organizations, the Sault Ste. Marie Innovation Centre is a ***catalyst for change***. We promote and assist in the development of knowledge based industries in the Algoma District as a means to diversify the economy of the region and build a strong, stable economic base. Our activities include partnering and business development, accessing national and international markets, promotion and awareness, building human resources and enabling other economic sectors through the use of information technology.

Vision

SSMIC is an organization expanding its expertise to nurture new ideas enabling the use of existing and emerging technologies and leveraging the development of public and private sector partnerships to promote economic diversification.

Mission

To lead in creating and adding value to new and existing businesses and developing creative partnerships in applied technology to enhance the economic benefits for business and communities.

Goals

1. To create business opportunities that secure national or international knowledge-based business presence in the community.

2. To develop opportunities for expansion and diversification of businesses directly, or through partnership development.

3. To promote, develop and future new businesses.

4. To foster development of new ideas and local initiatives that enhances wealth and job creation in the community and beyond.

5. To create a critical mass of expertise in information technology and management, and geomatics, that stimulate innovation, capitalize on economies of scale, and support new and existing business opportunities.

6. To ensure that the Innovation Centre remains solvent and sustainable fulfilling its mission, meeting the goals and objectives of its strategy, and providing value added to the community.

7. To establish innovative business-to-business partnerships or alliances which promote synergy and foster effective and efficient business opportunities.

8. To enhance the understanding and use of innovation and enabling technologies by businesses so they can empower new knowledge for personal and professional benefit.

9. To develop communication venues that promote community awareness, engage local entrepreneurs, and foster acceptance.

10. To build financial equity in developing a vibrant and strong organization.

Northwestern Ontario Innovation Centre

Mission Statement:
The Northwestern Ontario Innovation Centre will act as a catalyst to:

1. Create jobs by supporting innovative entrepreneurs to establish and/or expand their businesses.

2. Contribute to the long-term economic growth of Thunder Bay and Northwestern Ontario.

3. Create conditions favourable for technology transfer to industry through development and commercialization of innovative companies

4. Encourage ongoing co-operation between business, education and government.

5. Support innovative projects.

Our Values

- We lead change and act on ideas. We implement where others won't.
- To only undertake innovative projects and programs where we can clearly illustrate value to our clients, partners, members and sponsors. We are committed to ensuring responsibility and accountability for our efforts.
- To seek long-term value-added client relationships rooted in partnership and based on success.
- People matter. We are committed to an honest, open corporate culture based on team work, ethics, integrity and outstanding results.

APPENDIX 1 – ON-LINE SURVEY RESPONSES

List of all the companies contacted to participate in the survey.

24/7 Message Centre
A C O Services Inc
Aaron's Sales & Lease Ownership
Abacus Computer Solutions
Advanced Electronics
Adventure Group The
Amik Technology
APlus Computer Innovations
Astrocom Cable Vision
B B M Services
BDO Business Technology Solutions Inc
BELL CANADA
Best Way Rentals & Sales
Blair Electronics Inc
Blue Sparkle Layout And Graphic Designs
Boyce Networks Inc
CCS Central Computer Services Inc
Choice Computers
City of Dryden
Compu BASICS
Compugen Inc
Computer Guy
Computer Knowledge
Contact North - Contact Nord
Corporate Graphics Northwest Inc
CRC Communications Limited
Custom Computer Service
Data 1 Computer Centre
Dave Hill Rent To Own
Dawes Computer Services
Design House
Digi Trends
Donny “B”
Dream Horizons
Dryden Mobility
Dufresne Furniture & Appliances
Dunrite Services
Dynetic Systems
Easyhome
Enlink Computer Specialists Inc
Espee Designs
Everest College (Formally CDI College)
F T S Financial Services Ltd
Fahlman Computing
Fiber-Tel Electronics Inc
Firedog Communications
Future Shop The
Generator
Geraldton Community Forest Inc
Gigabyte Consulting Inc
Global Computer Maintenance & Support
Good Impressions Printing
Home Base Laptops
Home Base Satellite
Howarth’s Home Centre
Hunt Technologies
I C S Electronics
IDEAS Software & Training Inc.
innovated.ca
Island Ink Jet
Istech Computers
J B Electronics
Jentar EBS-Web Design
Jonmar Ltd
Jumpstart PC
Kalax Computer Services
Kamputers
Kenora Mobile Communications
Kestrel Forestry Ltd
Korkola Design Communications
Lakehead Communications
Lee’s Home Electronics Sales & Service
Lehto Rainbow Printers Ltd
Lowery’s Basics
M J K Consulting

Manitou Publishing
Marcar Bookkeeping Services
Masterpiece Graphics
Mentor Computers
MicroAge Computer Centre
Nerds On Site
Network & Automation Systems Inc
Nexinnovations
Norlink
Nortec Computers
Northern Computer Innovations Ltd
Northern Lights Satellite Ltd
Northern Sound & Systems
Northland Basics
Northwest Design Communications Ltd
Oshtugon Computers Inc
Overdrive Design Labs Inc
P C Medic
Pack Pros Plus Ltd
PC Medic
PM Computer Services
Power & Sound Installations
PragMagic Group The
R F Computer Services
Recon Programming
Sam Niemi DesignWorks Inc
Scandcorp Creative Training Solutions
Sencia Canada Ltd
Sequitur Internet Development Inc
Shaw Cable
Signal Resources Ltd
Signhawk Graphics
Softsell
Sound Stereo Service
Star Tek Satellite
Superior Sight & Sound
TBayTel
Tec-Direct Technologies (Canada) Corporation
Teleco Supply Co Ltd
The Power Centre
The Source by Circuit City
Thunder Bay Audio Visual
Thunder Bay Business Systems
Total Tech Care Ltd
Turn-Key Construction Inc
Up 'N Running PC Repair
UVQ.com
Viljo’s Electronics & Furniture
Voxdigital.com
West Side Audio & Comfort
Wilson’s Business Solution

Innovative (Unique) Products/Services Companies Are Offering
Partnering with remote and rural First Nations to support locally owned and maintained IT networks, services and applications including telemedicine, e-learning, cellular services, etc.
Infonaut develops map-based decision-making tools for infectious disease surveillance and control. Infonaut\'s web-based application suite, Infonaut Live, consists of three separate products: Hospital Watch Live, Infection Watch Live and Region Watch Live. These location-based business intelligence solutions provide disease surveillance, emergency preparedness, planning and response at different geographic thresholds: in-building, community-level, and state/provincial/federal.
Enterprise level web/browser based systems for aviation - comprehensive world leading features for the aviation industry in technologically advanced applications.
Enterprise Asset Management software
Computer Language Runtime Development
JustParts.com is a new online marketplace dedicated to the buying and selling of new and used auto parts and accessories.
Network application monitoring and management.
Sales and service of helping people communicate. IP phone systems for business, network cabling, point to point wireless data, cell phones, Blackberries, PDA's, Wireless Internet, etc.

Innovative (Unique) Products/Services Companies Are Offering
Software for the distribution industry including Web ordering through to vendor EDI.
YANAD is general practice ICT consultancy. I go to homes and micro businesses, troubleshoot problems in their environment, and offer solutions to those problems. The solutions range from simple repair and malware removal to designing IT infrastructure. Lately, most of my customers are consumers who demand and receive tutorials on the use of their information systems.
Contact North/Contact Nord is Northern Ontario's Distance Education and Training Network. We facilitate access to the education and training opportunities offered by Northern Ontario\'s colleges, universities and other training organizations. Access to the education and training opportunities is provided using learning technologies such as audio conference, videoconference and e-learning serving learners in 92 small and remote communities across Northern Ontario.
Main service is 3D Modeling and animation. Future service will include Motion Capture capabilities.
Implement and troubleshoot computer data infrastructure networks. Configure Voice over IP, Security, Wireless and Routing /switching for organizations with Cisco / Nortel networks.
CCS has developed robust, custom software in the areas of industrial weight scale systems (saw/pulp mills), geographic information systems, portable in-field data collection, inventory management, sales, tourism and human resources. One of these products is GEREMA, a software package for managing and reporting spatial data which is built on ESRI ArcObjects and Microsoft's™ latest .NET technologies. CCS has Dell certified technicians and is an HP authorized service center. CCS also provides network planning, administration and maintenance.
WEEE OES Steward Phase 1, networking, web design, computer repairs, new & used computers,
Sales, Service and Installation of Xplornet Products Installation of VSAT Systems
Smart Office Technology & Services
Professional photography by Mark Primavera offers product photography, portrait, wedding, sports and model portfolios. Primavera Photography is the premier digital infrared photography studio. We are now offering digital infrared portrait/modeling sessions.
Audio visual services for the corporate world from lcd/dvd combination units to full audio visual live presentations to web casting
High end web site development. Secure database driven backends. Content Managements Systems. E-commerce. Graphic Design. Hosting
Assistive Devices for the Visually Impaired. Custom built computer systems for home or business
Full range of Mandatory Public Health Programs, Two nursing stations providing non-urgent primary care, Adult community mental health program, Addictions program for youth and adults, Speech Language Program for Children 0-6, Healthy Babies and Healthy Children Program including several Best Start Initiatives.
We offer training on the use of computers for navigating the Internet, printing, scanning pictures, etc.
Media broadcast advertising
e-business Strategy and Execution under the new discipline of e-business Science (Commerce & Computer Science Synergized) while effectively using management science techniques with Six Sigma and other best practices. We identify opportunities for companies as well as ameliorate cost uncertainties related to e-business adoption turbulence.
Complete residential and business technology solutions, including dial tone, toll services, Internet, data, telecom products, and managed solutions.
Municipal Services

Innovative (Unique) Products/Services Companies Are Offering
municipal services and information
TBayIT offers custom web based database driven applications including content management solutions, email & contact management systems, collaboration systems and client/data management tools. We also provide web hosting and any other web related services.
We offer competitive rates for all computer repairs and service. We are the only computer repair center to offer Remote Assistance as a full time tool for all of our customers, residential and commercial. We also offer video surveillance solutions and other surveillance equipment such as; GPS Tracking and locating devices.
Web Based Applications, Web Development, Learning management Systems, Hosting and Creative Services.
Web design and photography
Tourism Website with inquiry system, Video Conferencing System install, Website design specializing in SEO, Network Technician Service with resources here and in Winnipeg
Variety of electronic goods
Technical Computer Services Point of Sales Services
Professional Forestry, GIS, and related database services
Four Leaf Solutions Inc. is a total IT solution provider. We market ourselves as a one stop shop for all of our clients™ IT needs. The following is a comprehensive list of the IT services we provide: Corporate Services Support, Firewall/router installation configuration, Switch installation configuration, Remote access consultation and configuration, Secure wireless setup, Server purchasing/configuration/installation/support, Microsoft Windows Server, 2003/Exchange/SharePoint/SQL installation, configuration, Upgrade existing installations or provide a completely new installation, Client-Server anti-virus installation and setup, Workstation - Purchasing, installation and configuration (both software and hardware), Hardware recommendations, Hardware and software updates, Virus cleaning/spy ware removal , Backup consultation and configuration both onsite and offsite, Software Development - Design, development, analysis, implementation. ASP, ASP.NET, VB, VB.NET, C#, Java, JavaScript, HTML, XML, OSIsoft PI, SAP Illuminator/xMII, Business Intelligence - Design, development, analysis, implementation, database administration. SQL, Oracle, Business Objects, Data warehouse, Web / Graphic Design / Hosting - Websites, graphic design, intranet sites, SharePoint, Technical Documentation - Analysis, writing, review/amendments, Quality Assurance - Testing, scripting, code review, performance/profiling, stress testing, Project Management - Project management, estimation, planning, change management, Business Analysis - CRM, requirements gathering, UML, use cases, functional requirements , Application Support - IT support, on call, custom software support, server administration etc..., Training - teaching, contract work as per current company knowledge, implementation training for off the shelf products
Known for the enthusiasm and competency of our people, MicroAge offers multiplatform expertise across a full range of hardware, software and services - including design, procurement, implementation, management and support - and we work in partnership with leading global technology companies like HP, IBM, Cisco, Microsoft and VMware.
Complete system integration and networks. Database development and training.
We provide a variety of web solutions for clients, and specialize in electronic media solutions
We design excellent websites.

Other Company Categories Participants Felt Their Organization Fell Into
Enterprise level systems products for aviation

Other Company Categories Participants Felt Their Organization Fell Into
Content Management Development
Rogers Wireless Dealer
Northern Ontario's Distance Education and Training Network
Game development
WEEE OES Steward
Product photography for the web
Live presentation
Relaxation and entertainment
Scanning
Media
e-business Consulting
Local Government
Municipality
Security Equipment & Service
Learning Management Systems
Audio Visual communication systems
Remote Backup Solutions
Business Intelligence
Data Warehousing and Co-Location
Electronic media creation
Graphic design.

Other Category for “What category or categories should your company be listed in?”
Enterprise level systems products for aviation
Content Management Development
Rogers Wireless Dealer
Northern Ontario's Distance Education and Training Network
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Live presentation
Relaxation and entertainment
Scanning
Media
e-business Consulting
Local Government

Municipality
Security Equipment & Service
Learning Management Systems
Audio Visual communication systems
Remote Backup Solutions
Business Intelligence
Data Warehousing and Co-Location
Electronic media creation
Graphic design

Please describe the innovative (unique) products/services your company offers?
Partnering with remote and rural First Nations to support locally owned and maintained IT networks, services and applications including telemedicine, e-learning, cellular services, etc.
Infonaut develops map-based decision-making tools for infectious disease surveillance and control. Infonaut's web-based application suite, Infonaut Live, consists of three separate products: Hospital Watch Live, Infection Watch Live and Region Watch Live. These location-based business intelligence solutions provide disease surveillance, emergency preparedness, planning and response at different geographic thresholds: in-building, community-level, and state/provincial/federal.
Enterprise level web/browser based systems for aviation - comprehensive world leading features for the aviation industry in technologically advanced applications.
Enterprise Asset Management software
We do not produce anything. We provide free adult upgrading
Computer Language Runtime Development
JustParts.com is a new online marketplace dedicated to the buying and selling of new and used auto parts and accessories.
Network application monitoring and management.
Sales and service of helping people communicate. IP phone systems for business, network cabling, point to point wireless data, cell phones, BlackBerry’s, PDA's, Wireless Internet, etc.
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"Professional photography by Mark Primavera offers product photography, portrait, wedding, sports and model portfolios. Primavera Photography is the premier digital infrared photography studio. We are now offering digital infrared portrait/modeling sessions."
audio visual services for the corporate world from LCD/DVD combination units to full audio visual live presentations to web casting
High end web site development. Secure database driven back ends. Content Managements Systems. E-commerce. Graphic Design. Hosting
"Assistive Devices for the Visually Impaired
Custom built computer systems for home or business"
We have open mike almost every night, beers and spirits from around the globe, and an eighty item menu from breakfast to pasta.
Full range of Mandatory Public Health Programs, Two nursing stations providing non-urgent primary care, Adult community mental health program, Addictions program for youth and adults, Speech Language Program for Children 0-6, Healthy Babies and Healthy Children Program including several Best Start Initiatives.
We offer training on the use of computers for navigating the Internet, printing, scanning pictures, etc.
Media broadcast advertising
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Web Based Applications, Web Development, Learning management Systems, Hosting and Creative Services.
Web design, photography
Tourism Website with inquiry system, Video Conferencing System install, Website design specializing in SEO, Network Technician Service with resources here and in Winnipeg
Consumables, toners, ink, tapes, Accessories (i.e. carry cases, cleaning products), Adapters of all types, Apple products, Batteries for most brands, Cables and cable products including fibre, Computers (Apple, HP/Compaq), Digital Cameras, Tape drives, USB & Firewire drives, hubs, etc., Ergotron and Executech ergonomic products, Mice, Keyboards and scanners, Internal devices i.e. hard drives, CDRW, DVD etc., Media i.e. CD-R, CDRW, DVD, ZIP, tape, floppy, Memory and processors for almost any system, Monitors (many brands), Network hardware i.e. nics, routers, switches (many brands include Cisco)
PCI adapters, PCMCIA & PC-Card adapters, PDA and accessories, Power products, UPS, surge and line conditioners, Printers & plotters including the full line of HP products, Ricoh multifunction products, Projectors, InFocus, Proxima, HP, and others, Software, Wireless products (many brands), Extended warranties, Service (Help Desk and Contracts), VectorSoft Digitizing Services, Equitrac Document Tracking, IP Phones and systems (Epygi, Aastra, others), Remote Backup Service
Technical Computer Services, Point of Sales Services
Professional Forestry, GIS, and related database services

Please describe the innovative (unique) products/services your company offers?
Four Leaf Solutions Inc. is a total IT solution provider. We market ourselves as a one stop shop for all of our clients IT needs. The following is a comprehensive list of the IT services we provide: • Corporate Services Support • Firewall/router installation configuration • Switch installation configuration • Remote access consultation and configuration • Secure wireless setup • Server purchasing/configuration/installation/support • Microsoft Windows Server 2003/Exchange/SharePoint/SQL installation, configuration, • Upgrade existing installations or provide a completely new installation • Client-Server anti-virus installation and setup • Workstation - Purchasing, installation and configuration (both software and hardware) • Hardware recommendations • Hardware and software updates • Virus cleaning/spy ware removal • Backup consultation and configuration both onsite and offsite • Software Development - Design, development, analysis, implementation. ASP, ASP.NET, VB, VB.NET, C#, Java, JavaScript, HTML, XML, OSIsoft PI, SAP Illuminator/xMII • Business Intelligence - Design, development, analysis, implementation, database administration. SQL, Oracle, Business Objects, Data warehouse. • Web / Graphic Design / Hosting - Websites, graphic design, intranet sites, SharePoint • Technical Documentation - Analysis, writing, review/amendments • Quality Assurance - Testing, scripting, code review, performance/profiling, stress testing • Project Management - Project management, estimation, planning, change management • Business Analysis - CRM, requirements gathering, UML, use cases, functional requirements • Application Support - IT support, on call, custom software support, server administration etc... • Training - teaching, contract work as per current company knowledge, implementation training for off the shelf products
Known for the enthusiasm and competency of our people, MicroAge offers multiplatform expertise across a full range of hardware, software and services - including design, procurement, implementation, management and support - and we work in partnership with leading global technology companies like HP, IBM, Cisco, Microsoft

Please describe the innovative (unique) products/services your company offers?
and VMware.
Complete system integration and networks. Database development and training.
We provide a variety of web solutions for clients, and specialize in electronic media solutions
We design excellent websites.

APPENDIX 2 – WRITTEN SURVEY RESPONSES

Q3 - Comment box responses for "How much additional business has been attracted to your organization as a result of your website?"
difficult to answer as we've had one since mid 90's
cancer.ca has been around a while and out IT department is based in Toronto
we have lots of long term clients; if it were less the website would be even more
not sure
our website serves solely as a resource for patient care at the moment
Show department
been in business for only 10 months
we are looking to gain exposure about an organization and what we do (we are non-profit)
we are only online
new website soon to be released
Don't know off the top of my head
Just upgraded our site; New content Management System; Not sure how much new business we have yet.
Hard to say because we've always had a website and are in the industry
As a hospital we're not trying to attract patients but we do receive inquires about specialized treatments or physicians
hard to say; very focused client base and relationship based
Had website from beginning
regular annual increase
our website is our biggest form of draw to the hotel
clients who come in use the website to find that we exist the internet plus word of mouth and referrals makes our service usable
website is very new, hard to monitor at this time
good traffic; weekly and monthly reports to show growth and potential
rebranding also helped
to increase further we will be developing more online functionality; interactive customer service; shopping etc

Q3 - Comment box responses for "How much additional business has been attracted to your organization as a result of your website?"
enrollment team assisted in a 14% application increase with IT support; newsletter in the works
it has exposed our company to a wider audience
the college website is lacking in appearance and could use some updating; the accessibility and availability of information for students, parents, and prospective students is impeccable
almost all our business is done online
Having a website gives us the ability to interact and engage with our target market especially since most of our potential clients are located in remote isolated communities albeit with broadband internet access
Not sure; but numbers are up from old site
estimate based on assumption that significant portion of inquiries to the town's website result in business for local businesses
Prefer not to advertise or promote, as my company delivers consulting services and is typically over-booked based on network and word-of-mouth contact. My line of work (consulting) has never, in 23 years, attracted a desirable client based on cold calls from other companies… every client has been based on personal contact and reputation. Also, have no intent to grow current business into something less manageable and less focused (and less satisfying and less fun).
Since 100% of my customers say they visit my site regularly, I could claim that I get all my business through my Web site, but that claim would be as inaccurate as the statistic that I've taken from my database. My regular customers and I jokingly refer to my business as ICT for Luddites. Between 2004 and 2008, 70% of my business came from newspaper advertising. This year, 50% of my business comes from Sault This Week, 48.55% comes from personal referrals and personal networking, and the rest comes from my Web site. Customers visit my site either to check my credentials before they call me or to get general information about computers after I've helped them.
50 % of our business is in online training
Leisure services program registrations, arena events
Limited impact
Website has not been up long, which is directly linked to why the percentage is very low
Our website is going online in February 2010, so hope this will have a marked impact on the interest in our festival
under construction
website has lots of hits
I'm hoping it will attract people. Have one in the works
Not sure, only our second year; our new website should certainly increase our attendance at the festival; we also advertise on radio and newspaper

Other Category results for Q3. Beyond your website, do you undertake additional marketing activities online?
Gallery

Other Category results for Q3. Beyond your website, do you undertake additional marketing activities online?
direct marketing
online giving
student work is displayed online
invest in Ontario site interactive kiosks at Tourist Information centre;
Online magazines,
website searching for companies
currently working with several charity projects

Q4 Responses: What new IT practices/strategies has your organization implemented in the last 3 years? (e.g. wifi, online store, VoIP phone system)
increased material made available online
wiki's
online store
Skype
Wi-Fi
increased online services
online calendar and programs
VOIP system
Screen
Intranet
Practice management system
Increase in website
paperless archiving
voice mail to email
electronic invoices and statements
virtualization of servers
video conferencing
iphone/blackberry application
own tools
Videos
social networks
server upgrades
intranet content management system

Q4 Responses: What new IT practices/strategies has your organization implemented in the last 3 years? (e.g. wifi, online store, VoIP phone system)
medical-specific IT
IPTV
online giving
shared file server between offices
hiring more IT staff
LAN
WAN
smart board
website search engine optimization
email flyers
web flyers
Google analytics
internal employee website with CEO blog
online registration
distant education
online testing
blackboard software
pay tuition
online client survey
blackberry server
keyfob access system
automated telephone system
PBWorks extensively (a wiki collaborative environment)
Prezi.com
MS Publisher
cell phone
Database
Printer
Scanner
online survey research engine
Human Process Management (Action Base)
Business Process Management

Q4 Responses: What new IT practices/strategies has your organization implemented in the last 3 years? (e.g. wifi, online store, VoIP phone system)
High-speed internet
Laptops

* some responses are not included in the above chart to eliminate duplication

Q5 Responses: What IT practices does your organization intend to implement or pursue in the next 3 years?
more social media
chat tool
email marketing
social networking
improvement/expansion of existing online services
internet ads
Increased SEO
web development/design training
on-line reservations and orders
making what we have now work more smoothly
living streaming video podcasts
time allowing solution
RFID tags for file tracking
Marketing
Blogging
whatever it takes to sell our product
mobile advertising
new videos
more user friendly interfaces
online store
file management
document management
E-health strategies
content management system for external website
offering clients "real time" feedback on program with projects
using software solution for managing projects
Hr

Q5 Responses: What IT practices does your organization intend to implement or pursue in the next 3 years?
online video
moving applications to the "cloud"
Hardware changeover
more detailed online sales
call centre
Wifi
optimize website
VoIP
Ecommerce
video streaming
wireless internet
new phone systems
Forums
social media tools
further social media integration
IPTV
Hoping to design and develop mobile interface
Facebook
more interactive website
greater involvement by more staff in keeping information up to date
Integrated with other government websites
more sophisticated approach to use internet
web-based database
online application and fee payment
video conferencing
Continuation of virtualization for server consolidation
employee self service for vacation and benefit entitlements
ITIL for delivering IT services
disaster recovery planning
Possibly a VoIP system
Use of OpenOffice.org instead of Microsoft Office
Possibly open up Facebook and the social networking application
Linked In

Q5 Responses: What IT practices does your organization intend to implement or pursue in the next 3 years?
Local town website links
Planning a website for the business to showcase products and allow them to order
Require cell and internet service at lodge
will require satellite
Website marketing and sales

* some responses are not included in the above chart to eliminate duplication

Q6 Responses: What are some of the challenges that your organization has faced implementing IT?
lack of funds - non/profit
staying on top of changes
knowledge and training
making it easy to use
Time constraints; Patience; customer adoption of technology
The rate of change
Having employees all across the province and having IT in one area
costs; assurance that the software will do what it will provide
corporate policy is very strict at Thunder Bay Regional
budget; knowledge
most social media tools and sites are blocked by corporate firewalls
version compatibility for users
doing it all ourselves
money; time
No notable challenges have been faced
Trying to implement and support everything; people seem to be expecting
cost; if there is really a benefit
costs, expensive to implement
Lack of credible options; training; rapid change of pace/software/hardware
privacy issues; budget support; lack of leadership interest/support (in case of social media)
small business with big costs
Talented people
Access to reliable broadband
knowledge; time to implement; security online

Q6 Responses: What are some of the challenges that your organization has faced implementing IT?
cost; knowledge
user friendly; attractive to everyone
Costs
large organization
no time
3 separate offices; lack of qualified IT staff
time/resources
needing larger server; more restricted access to system
learning about what new technology is and how it works; try to determine if these tools will be relevant to our B2B
no dedicated staff for IT
Lack of trained IT staff, no qualifications relating to trends
cost/budget
not enough knowledge and training
cost of technical support
resources; changing technology; email and text message; opt out policy
difficulty with communications between new web developer (located in Toronto); Low consistency
3 separate offices and lack of IT staff
perceived firewall challenges; human resources: human, financial
finances; human resources (skill and time)
as we are just new we are learning as we go. Although we understand the importance of a great website everything is so expensive to get rolling
limited budget; out of date workstations
effectively communicating with audience
Staffing
Internet government approved processes
keeping it current; time consuming
Cost; expertise;
Some gaps in internet service in our region
networking office
communication; support; training;
Have an IT department
Lack of resources for web development and content development; low priority compared to infrastructure

Q6 Responses: What are some of the challenges that your organization has faced implementing IT?
development projects; low staffing;
Understanding of issues and technologies associated with state of the art IT infrastructures; general misinformation as it relates to IT
Lack of local competition;
Don't really have any within my own company. However, challenges facing my clients are numerous and varied. Increased and dynamically changing regulatory compliance requirements would be the biggest challenge that comes to mind… modifying systems to meet changing and ludicrous accounting rules ("new GAAP"), tying up IT staff with varieties of audits pertaining to security and data retention, meeting privacy requirements, etc. What this does is tie up valuable IT resources when they could and should be focusing on using technology (and, more importantly, information systems) to improve the business and provide competitive advantage. This ends up eroding IT effectiveness for the business side of the organization, and the business in turn goes rogue, developing or procuring poor-quality data systems because IT cannot meet their business requirements in a timely manner, with hell to pay down the road.
Educating customers
End user training vs. new software upgrades.
Newer more advanced firewall security antivirus programs.
Costs
Lack of resources - human and financial
Software upgrades, updates remotely
High speed internet
Lack of knowledge and training
Getting reliable high speed internet
Slow internet service, training
old technology; complicated to use

Q7 How has your organization overcome these challenges?
made website - a priority on budget
not sure
self-educating; talking to industry professionals
focusing on the user
Track blogs
Same network; large department
contracts; change in our demands put on providers
we have had trouble with creating new web strategies because of bureaucracy
we have not

Q7 How has your organization overcome these challenges?
testing products on various platforms
late nights; not knowing how to quit
still need money
still a challenge
Research
we have tried to learn about IT and new developments as we go along
haven't
Education
on call technicians; knowledgeable staff/tech savvy
persistence in attracting quality people; establishing relationships
multiple internet connections
haven't
contracting the work
working on IT with IT department
working on it
still working at them
Money
worked with Sencia
attend seminars to learn more; search websites to learn more
we haven't
outsourced our IT needs, network, website etc.
using free services such as Skype/twitter/etc
seeking funding; readjusting budget
increase expertise/knowledge pool
ongoing processes; regular reviews; status reports
They've attempted to overcome these issues by hiring more staff
Training
one step at a time
with project-based funding, we try to building website or IT funding for each project
study how other companies effectively do it
Intern
Somewhat
work with IT firm to update every 6 months

Q7 How has your organization overcome these challenges?
Creative budgeting; government assistance; diversifying;
Utilized programming/funding where applicable
Hired outside help to get up/trouble shoot
unsure; not communicated to employees
stalled progress unfortunately
Educating council to ensure that they have full understanding of the issues and technologies
Cannot overcome them without more competition
Judicious use of tazers at meetings. Never aim for the chest, and only for 3 seconds or less at a time.
This year, I've made most of my money by removing Service Pack 3 from computers that do not need it and by installing Ubuntu on computers that Windows Genuine Advantage disabled.
We haven't. We help staff on demand.
Not yet
We have not
Tried different providers, spent money
working on this

APPENDIX 3 – EXAMPLES AND DISADVANTAGES

Examples of Data Centres Using or Planned to Use Green Energy

Solar

AISO.net - Romoland, California – 100% solar power

I/O Data Centers – Phoenix, Arizona - Partial

Microsoft – San Antonio, Texas – Delayed due to cost

Wind

Baryonyx – Stratford, Texas – Planned with 100 wind turbines

Granite Block Global Data Center Inc. - Fall River, Massachusetts - Planned and will generate approx. 20% energy needs

Hydro

Rackforce – Kelowna, British Columbia – Will utilize BC hydro power

Yahoo! – Lockport, New York – Will utilize Niagara Falls hydro power

Disadvantages of Green Power Options for Data Centres

Solar

- Very expensive
- Poor energy generation
- Battery technology isn't fully developed
- Visual hindrance

Wind Turbines

- Very expensive
- Poor energy generation
- Inconsistent air currents
- Visual and sound hindrance
- Unique location required

Hydro Electricity

- Unique location required
- Very expensive
- Negative affect on environment

APPENDIX 4 - PROPOSED LEVERAGING ICT FOR GROWTH

Program Objectives

1. To increase the successful adoption of ICT technology by SMEs and small non-profit organizations in Northern Ontario.
2. To enhance the productivity, innovation, market access and growth of Northern Ontario SMEs through strategic investment in ICT projects.
3. To stimulate the growth of the Northern Ontario ICT sector and increase the capacity of Northern Ontario ICT providers to service the SME sector.

Program Eligibility

1. SME or non-profit organization with less than 60 employees and under $1 million in annual gross revenue.
2. Applicants must provide an ICT strategy in the context of their business strategy or they must complete the initial assessment phase to obtain this strategy.

3. Projects that demonstrate potential for revenue growth, market diversification, job creation and/or productivity enhancement.

Program Details

Applicants can apply for the following:

1. Initial Assessment - $1,000 to $5,000 – maximum of 90% of eligible costs supported through the Global Access Program.
    a. To assess the business and prepare an ICT strategy that demonstrates potential for revenue growth, market diversification and/or productivity enhancement. This strategy must illustrate how this fits with the business' plans and strategy.
2. Implementation Support – Up to $30,000 – maximum of 75% of eligible costs supported.
    a. For the implementation of ICT. This can include a variety of projects depending on the business' strategy – e-commerce, internet marketing, social media campaigns, CRM, business management software…

Requirements

1. Applicants select a qualified contractor to provide expertise to the project. If utilizing a contractor from outside of Northern Ontario, applicants must provide documentation illustrating why a Northern Ontario service provider could not be utilized for their project.
2. If applying for support to cover internal labour costs, the applicant must verify the cost based on a quote from an external provider.
3. The applicant and the contractor are responsible for verifying the outcomes of the ICT project.

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ENDNOTES

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