Information Communication Technology

Skills Gap Analysis in the Blue Sky Region

February 2012

Prepared by:

Precision
Management

North Bay, ON Canada   P1C 1K7

(705-495-6814   **www.precisionstrategy.ca**

Table of Contents

Executive Summary

To determine what skills gap exists and what future gap is anticipated in the information, communication, and technology (ICT) sector in the Blue Sky region, Precision Management was engaged by Blue Sky Economic Growth Corporation to interview regional employers. During the study, 25 employers, with ICT staff numbering from one to 95, were interviewed. More than half the respondents anticipated growth in the next three years, with three anticipating major growth. Thirteen employers said they like to hire ICT graduates with programming skills, and five look for graduates with networking skills, with all of them asking the college to re-instate this education so graduates will learn fundamental ICT skills. The balance of respondents want graduates to have hardware, web design, technical support, SQL, electronics, Microsoft, Mac, and Windows skills. Mobile-phone application is now offered at Canadore College, and while it is a growth industry, only one employer in this study expressed interest in these skills for new hires. Employers believe these skills are in greater demand in larger companies typically located in larger cities.

Right now, there is a gap between ICT skills demand and supply, with employers luring each other's staff away from each other. ICT employers anticipate growth, so the gap will widen, particularly because programming and networking education at Canadore College was cut due to low enrolment. Ten respondents are concerned that Canadore cut these vital programs. None of them expect the college to operate at a loss, but they do believe that students should be better informed about the positive local job prospects that await them. One employer suggested a progressive approach with a "*North Bay Needs You*" campaign that would show potential ICT students there are great prospects locally for ICT graduates.

Respondents prefer to hire locally so that staff with roots to the area have that as a reason to stay in positions longer term, and failing that hire from Sudbury where Cambrian College offers a technology program. Senior ICT professionals with large corporate experience typically are not available locally, so employers search in larger cities for these types of candidates.

Some employers have had difficulty connecting with college staff about access to students. Canadore College recently launched a new *Career Centre*, but because it is so new, none of the employers interviewed mentioned it. The college's goal is to have a place and web presence where employers can post positions, ask for students to work on real-work assignments, and ask staff to contact them directly. With this centre, the college is now positioned to address access issues and respond to employers more efficiently.

One employer with ICT staff operating in the mining industry proposed a "*Full Op*" model, wherein students would work full time, earning a salary as opposed to paying tuition. Employers would pay tuition to the educational institution, who in turn, would teach students and grant diplomas. Canadore College's President, George Burton is open to the idea but faces the dilemma of gaining a critical mass of student and employer interest. He would need at least five businesses in an industry to hire five students each.

Based on the feedback in this study, we make the following recommendations:

Recommendation: Make it worthwhile for Canadore College to re-instate programming and networking education by engaging employers, ICT graduates, the college, university, and city to build secondary-school student interest in ICT with short frequent talks with leave-behind brochures, educating students about the good jobs awaiting graduates. Create a "*Who Knew*?" campaign. "*Who knew ICT careers paid so well*?", "*Who knew there were so many ICT jobs here*?", and "*Who knew I could be fielding multiple ICT jobs offers*?"… "*Who knew*!"

Recommendation: Combine skills that students want with skills local employers want, specifically, incorporate mobile phone application education with core skills of programming. By offering mobile phone application education without other ICT skills sought locally, we are training our workforce to leave our region upon graduation.

Recommendation: Explore the potential of the Full Op model in the mining industry first because the ICT sector does not yet have the critical mass in the region to pilot this model.

Recommendation: Continue promoting the Career Centre and Canadore College's new web portal with a direct telephone campaign targeting employers and their HR staff. Walk them through the registration process to ensure they join and use the system, and then follow up with brief e-mail blasts monthly.

Overall, despite a growing ICT sector in Blue Sky, ICT education enrolment has dwindled, and demand is outstripping supply of ICT skills. The gap is widening, and this may translate into significant challenges such as lost sales, project delays, and postponed product launches. This type of lost revenue for the ICT sector means lost economic spin-off to the region. Why has this happened? When the tech bubble burst, students began to steer clear of the industry. Once the sector recovered and then continued to grow steadily, students remained obviously unaware about current and future ICT job opportunities. We need students to understand these opportunities and become excited at the prospects, not only for the benefit of employers but also for the benefit of the prospective students themselves, the college, and the region. We also need to be mindful of providing skills demanded locally. When we train our workforce with skills such as mobile phone application skills without adding skills sought locally, our skilled workforce leaves the region. The ICT skills gap is being felt across the country – and Blue Sky is no different. We need a collective campaign to promote ICT education, one that will position the ICT sector to grow as it anticipates and ultimately one that will help our region prosper.

Introduction

The ICT labour market has been studied provincially, and Ontario's outlook over the next five years anticipates skills shortages in many ICT fields with pervasive shortages anticipated for a number of positions, as noted in the Information and Communication Technology Council's chart below. Part of the Ontario ICT skills shortage relates to the dot.com recession from the beginning of 2001 to 2004 that saw a sharp drop in the number of graduates hired into ICT jobs. This drop in jobs turned many students away from pursuing this type of education, and five years later, there was a resulting acute shortage of ICT professionals with five years or more experience. While this shortage of experienced professionals has eased a bit, it is still a serious challenge for Ontario employers.[1]

To determine what skills gap exists and what future gap is anticipated in the information, communication, and technology (ICT) sector in the Blue Sky region, Precision Management was engaged by Blue Sky Economic Growth Corporation to interview regional employers. During the study, 25 employers were interviewed, primarily in the ICT sector with a few who employ full-time ICT staff yet operate in sectors outside ICT. The detailed answers to interview questions are in the Appendix at the end of this report. While interviews are synthesized and quotes excerpted in the body of the report for quick reading, readers are encouraged to examine the full interviews for the clearest perspective.

Ontario Outlook

Acute Excess of Supply over Demand	Excess of Supply over Demand	Skills Shortages in Many Fields	Excess of Demand over Supply: Pervasive Shortages	Acute Excess of Demand over Supply: Absolute Supply Constraints

	2010	2011	2012	2013	2014	2015	2016
A122 Computer and information systems managers							
A311 Telecommunication carriers managers							
C033 Electrical and electronics engineers							
C047 Computer engineers (except software engineers)							
C071 Information systems analysts and consultants							
C072 Database analysts and data administrators							
C073 Software engineers and designers							
C074 Computer programmers and interactive media developers							
C075 Web designers and developers							
C141 Electrical & electronics engineering technologists & technicians							
C181 Computer network technicians							
C182 User support technicians							
C183 Systems testing technicians							
F124 Broadcast technicians							

---

1. Information and Communication Technology Council. Outlook for Human Resources in the ICT Labour Market, 2011–2016, on-line available Feb. 2012 at **www.ictc-ctic.ca/Outlook_2011/on_en.html.**

Stakeholder Feedback

Anticipated ICT Growth

We asked employers of information, communication, technology (ICT) staff what type of growth they anticipated in ICT jobs over the next three years.

Responses out of 25

- Anticipate decline – 1
- Anticipate staying the same – 11
- Anticipate steady growth – 10
- Anticipate major growth – 3

Employers' Feedback

Employers interviewed ranged from small local companies to large ones with global operations. They report that the ICT sector in this region experiences low turnover of existing positions compared to other industries. Due to an excess demand over supply of ICT staff, regional employers sometimes hire staff away from each other's companies, so even companies who anticipate limited growth, still have the need to hire ICT staff. Only one of the 25 employers interviewed anticipates a minor decline – a banking institution that has outsourced its ICT needs. Thirteen of the employers anticipate growth – three of those anticipate major growth. The overall outlook, based on this sample, is positive, with steady job openings anticipated in the coming years.

Respondents' Number of ICT Staff

- 95 ICT
- 52 ICT North Bay, 102 IT Toronto
- 48 ICT plus 2 other staff
- 45 ICT and 15 ICT in U.S.
- 25 ICT in organization of 2,000 globally
- 24 ICT
- 18 ICT in organization of 125 locally
- 13 ICT
- 13 ICT
- 11 IT and 27 other staff globally
- 10 ICT and 50 other staff
- 10 ICT and contractors
- 10 ICT and one other staff
- 10 ICT
- 9 ICT and 31 other staff
- 8 ICT and 12 consultants
- 7 ICT
- 5 ICT and 5 other staff
- 5 ICT
- 4 ICT in organization of 1,600 locally
- 2 ICT in organization of 25 FT, 100 PT
- 2 ICT downsized from 10 ICT
- 2 ICT and 10 other staff
- 1 ICT and contract staff
- 1 ICT

Employers Say…

« *"My businesses are continuing to grow, and I anticipate they may do so by 40 percent. In one of my newer businesses …, we may be able to hire hundreds over the next couple of years."*

« *"We employ about 50 full-time IT staff, and our turnover is extremely low in North Bay. We have a very stable office staff here. Movement happens more internally."*

« *"My goal is to consolidate international logistics from France to our North Bay office, which would create a lot of new jobs, including ICT positions."*

« *"Even though we do not anticipate large growth, we do have turnover when staff move or take positions elsewhere, so we regularly hire every year."*

Skills in Demand

Responses out of 25

- n Programming   – 13
- n Networking   – 5
- n Hardware   – 5
- n Web design   – 3
- n Technical support   – 3
- n SQL   – 2
- n Electronics   – 2
- n Microsoft, Mac, Windows – 2

Employers' Feedback

When asked what skills ICT employers want in new staff, the majority of them, 13 of 25, said they look for programming skills. Five of them look for networking skills, and five said they wanted hardware skills. Many of them are looking for basic technical skills and train their staff for specific positions and tasks.

Employers, for the most part, are not looking for mobile phone application skills, stating that the need for those skills typically comes from larger companies in larger cities such as Toronto.

The majority of respondents are having increasing difficulty hiring programmers, citing the fact that Canadore College has dropped the Computer Analyst Program. The college recently dropped the course due to low student enrolment.

Employers Say…

« *"I hire people with programming experience, or ones who love to program, and train them for more specialized positions and work."*

« *"As we grow our custom software business, we look for Java programmers and young grads with SQL. My next hires I would hope would be from Canadore if they re-instate the CPA. Without it, hiring new staff may be a problem."*

« *"In the past, I have hired Canadore programmer grads, but now they seem to be in short supply."*

« *"We require networking and programming skills. I was highly disappointed Canadore cut the Computer Programming Analyst and the electronics programs. Seven of my 13 employees graduated from Canadore."*

« *"Our work is highly specialized, so I hire graduates who fit our business culture and can learn – people with a technical base who we can educate ourselves."*

« *"Installation and repair jobs require hardware skills. Overall, though, I look for trainable grads with networking skills."*

« *"Anyone with a programming background will have an advantage in gaining a job here."*

Source of Candidates

Responses out of 25

- North Bay region   – 25
- Sudbury region   – 8
- Larger centres   – 1

Employers' Feedback

Respondents prefer to hire locally so that staff with roots to the area have that as a reason to stay in positions longer term. They look for potential staff with programming and other skills in the region, and failing that from the Sudbury area where Cambrian College offers a technology program. Senior ICT professionals with large corporate experience are typically not available locally, so employers search in larger cities for these types of candidates.

A number of the respondents' staff and even some of the business owners are Canadore College graduates.

Employers Say…

« *"Our business plan for expansion mandates that we hire locally as much as possible. We're not interested in having logistical employees from France re-locate to North Bay. We want local recruits."*

« *"We hire locally and look for graduates from Canadore College. We have offices all over the North and hire graduates locally for those offices such as Sudbury and Timmins."*

« *"We hire gradates from Canadore. I hope they still teach hardware."*

« *"We hire locally when we can. The last time I hired a programmer, I had to get one from Sudbury because I couldn't find anyone here. We hire locally and have a number of Canadore graduates on staff."*

« *"We have hired some staff from Sudbury, but for the most part, we hire locally or at least people who are originally from this area because we want people to have a reason to stay here."*

« *"Because our main office is in Sudbury, we have a great relationship with Cambrian College and College Boreal who both have great technology programs. Particularly with Cambrian, I just shoot them an e-mail, and they send me recruits."*

Employer Suggestions

Responses out of 25

- Re-instate Canadore's CPA / networking program – 10
- Get word to students that there are jobs waiting – 2
- Improve liaison between employers and college / university – 2
- Recruit students with "*North Bay Needs You*" campaign – 1
- Institute "*Full Op*" – business pays students and college – 1
- Connect Nipissing to businesses re: grad skill sets – 1
- Create more college and university students placements – 1
- Develop North Bay into a software centre of excellence – 1
- No suggestions – 13

Employers Say...

Employers' Feedback

Respondents were asked what the college, university, government, or region could do to help reduce their ICT skills gap. Ten of them are concerned that, as one respondent says, "*Canadore cut out some vital IT programs.*" Many of the respondents want the college to provide the core skills of programming and networking again and are hoping this education can be re-instated in one form or another so that graduates will learn fundamental ICT skills. Employers appreciate that ICT programs can be expensive to operate and that there have been a dwindling number of students – none of them expect the college to operate at a loss. What some of them do believe is that students should be better informed about the positive local job prospects that await them when they get diplomas and degrees in this discipline. One employer suggested a progressive approach with a "*North Bay Needs You*" campaign that would show potential students that a number of well-paying jobs await ICT graduates in this area. Right now, there is a gap between ICT skills demand and supply, with employers luring each other's staff away from each other. With the anticipated ICT growth in the region, the gap will widen.

While mobile-phone application is a growth industry, only one employer in this study expressed interest in these skills for new hires. Employers believe these skills are in greater demand in larger companies typically located in larger cities. Accordingly, graduates with an education focus on mobile-phone applications will likely have to move away from this region to larger cities to use these skills.

≪ *"I hired a lot of graduates from the CPA program – it provided a good basis from which we further trained our staff. I recommend Nipissing and Canadore recruit students with a "North Bay Needs You" campaign – highlighting the availability of good-paying IT jobs for new graduates."*

≪ *"To Canadore College, I would say please re-instate the CPA program. For the region, I have a 10-year dream for the city – let's become a software development centre of excellence. "*

≪ *"We look to the university and particularly the college for new grads with high enthusiasm, so I would hope the CPA program would be re-started."*

≪ *"I know Canadore axed the CPA program due to limited student enrolment, but that means they are not getting the word out to students that IT jobs are waiting for them."*

≪ *"We typically hire graduates with programming or networking skills or both, so I suggest re-instating some version of that education."*

Other respondent's feedback included access to staff at Canadore College. Some employers have had difficulty connecting with college staff about access to students and potential new hires, even employers with good connections to Canadore College. When asked, Canadore College representatives said they have just launched a new web portal for employers called *The Career Centre* at www.canadorec.on.ca/departments-services/career-centre.   The college created the centre so employers can post a position, ask for students to work on real-work assignments, or ask staff to connect directly with employers in a timely way. This centre and web portal should allow the college to respond to employers more efficiently than it has in the past. Because it is so new, it is no surprise that none of the employers interviewed was aware of it. More work is needed for the college to get the word out to local employers.

One employer who has ICT staff but operates in the mining industry said industry moves too fast for some education and proposed a "*Full Op*" educational model, wherein students would work full time and earn a small salary as opposed to paying tuition. Employers would pay the balance of the wage as tuition to the educational institution, who in turn, would teach some material to students and grant diplomas. The employer said he has already run a similar program in mining without an educational partner and said, "*It really looks like a three-way win to me. The program teaches students to be on time, to perform, and to do a good job – essential soft skills.*" The employer met with Canadore College's President, George Burton, who is open to the idea but faces the dilemma of gaining a critical mass of student and employer interest. He would need at least five businesses in an industry to hire five students each.

Summary and Recommendations

The message from Blue Sky employers with ICT staff is very clear – many want programming and networking education at Canadore College re-instated and promotion of ICT education to students. Many of the respondents provide their ICT staff with more specialized training once hired, but employers state they need ICT graduates to have basic programming and networking skills. Since the ICT bubble burst a decade ago, student interest in ICT has waned with enrolment figures recently reaching an all-time low at Canadore College. Employers were already experiencing labour shortages of ICT staff and have been hiring ICT staff away from each other. With programming education being cut at Canadore and ICT business growing, they fear labour shortages will become more critical. From the college's perspective, the record-low student enrolment levels has resulted in programming and networking programs becoming unfeasible. Overall, there is an existing ICT labour gap with an excess of demand over supply, and this gap is continuing to widen with local programming and networking education having been cancelled, all while the local ICT sector is growing.

> **Recommendation:** Make it worthwhile for Canadore College to re-instate programming and networking education by engaging employers, ICT graduates, the college, university, and city to build secondary-school student interest in ICT with short frequent talks with leave-behind flyers, educating students about the good jobs awaiting graduates. Create a "*Who Knew*?" campaign. "*Who knew ICT careers paid so well*?", "*Who knew there were so many ICT jobs here*?", and "*Who knew I could be fielding multiple ICT jobs offers*?"… "*Who knew* !"

Another important point raised centres on mobile phone application education offered at Canadore. Graduates with this education will field multiple job offers – but they will not be from this area. None of the employers interviewed were hiring for this skill, although one employer said it was useful to include with programming. Employers report that bigger companies located outside the region in big cities such as Toronto seek employees with these skills – and none of the employers here in our region are in a position to create these types of jobs.

> **Recommendation:** Combine skills that students want with skills local employers want, specifically, incorporate mobile phone application education with core skills of programming. By offering mobile phone application education without other ICT skills sought locally, we are training our workforce to leave our region upon graduation.

Another idea presented by one employer was the Full-Op model with the potential to expand the college's capacity and prove popular with students who would earn income rather than having the drain of paying tuition. The employer discussed it with Canadore College's President who is interested but needs five students for each of five employers. As a result, this model may be better suited locally to the mining sector where there are more large employers. For the regional ICT sector, however, the model lacks enough large employers – although that may change in a few years based on employers' plans for growth.

> **Recommendation:** Explore potential of Full Op model in mining industry first.

Another suggestion was to improve liaison between employers and the college. In the past, employers interested in offering graduates jobs could not get timely responses. The college was aware of this, so in November 2011, it launched its Career Centre and web site with an Orbis Career Portal software platform to allow employers to post employment opportunities. To test response time, we sent a general e-mail request from the portal, and a staff member responded within a few hours. The local media published stories about the initiative, but a number of the respondents are unaware about the Centre. [2]

> **Recommendation:** Continue promoting the Career Centre and Canadore College's new web portal with a direct telephone campaign targeting employers and their HR staff. Walk them through the registration process to ensure they join and use the system, and then follow up with brief monthly e-mail blasts.
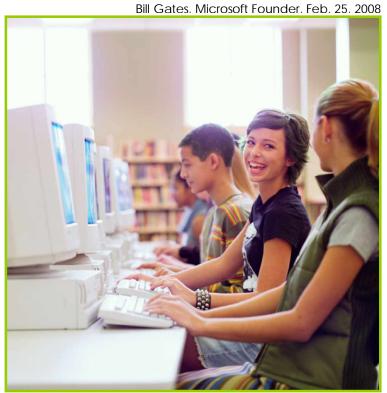
---

2. North Bay Nipissing.com. "*The right employee for the right job*," Dec. 2, 2011 on-line at **www.northbaynipissing.com/2011/12/the-right-employee-for-the-right-job/,** 600CKAT North Bay News. "*Canadore College Linking Graduates with Employers,*" Nov. 25, 2011 on-line at **http://blog.rogersbroadcasting.com/ckatnews/2011/11/25/canadore-college-linking-graduates-with-employers/,** and North Bay Nugget. "College launching new career centre," Dec. 2011 on-line at **www.nugget.ca/ArticleDisplay.aspx?e=3380733**.

Conclusion

Overall, despite a growing ICT sector in Blue Sky, ICT education enrolment has dwindled, and demand is outstripping supply of ICT skills. The gap is widening, and this may translate into significant challenges such as lost sales, project delays, and postponed product launches. This type of lost revenue for the ICT sector means lost economic spin-off to the region. Why has this happened? When the tech bubble burst, students began to steer clear of the industry. Once the sector recovered and then continued to grow steadily, students remained obviously unaware about current and future ICT job opportunities.   We need students to understand these opportunities and become excited at the prospects, not only for the benefit of employers but also for the benefit of the prospective students themselves, the college, and the region. We also need to be mindful of providing skills demanded locally. When we train our workforce with skills such as mobile phone application skills without adding skills sought locally, our skilled workforce leaves the region. The ICT skills gap is being felt across the country – and Blue Sky is no different. We need a collective campaign to promote ICT education, one that will position the ICT sector to grow as it anticipates and ultimately one that will help our region prosper.

Bill Gates Says

« *""Today, there simply aren't enough people with the right skills to fill the growing demand for computer scientists and computer engineers. This is a critical problem because technology holds the key to progress, and to addressing many of the world's most pressing problems, including health care, education, global inequality and climate change."*

Bill Gates, Microsoft Founder, Feb. 25, 2008

25 Interviews

1. What size of company do you have, and what growth do you anticipate in the next three years?

a) I have four companies. My ICT business employs 48 full-time ICT staff and two other staff in three divisions: IT service management, consulting and resourcing, and engineering. My businesses are continuing to grow, and I anticipate they may do so by 40 percent. In one of my newer businesses that focuses on mining blast rings, we may be able to hire hundreds over the next couple of years.

b) My company provides software systems that measure materials such as wheat, rice, and corn for industries such as chemical, pharmaceutical, agriculture, and mining. I employ 11 staff locally and 27 distributors and agents in 52 countries. We are going through a real growth stage.

c) My company employs 1,600 people, but only four of those are in IT. I anticipate growth, but only marginally in terms of IT staff.

d) Our company has grown from about 40 full-time staff to 45 here in North Bay. We have 15 others in the U.S. Even though we do not anticipate large growth, we do have turnover when staff move or take positions elsewhere, so we regularly hire every year.

e) Our company has grown from about 85 to 95 full-time staff over the last six years. Our growth has slowed, but we are still growing.

f) We have eight full-time staff and 12 consultants with plans to grow organically as we get into more software. We created the Business Adaptive System, software that started as service management software that manages assets and relationships – it's a program management office tool, risk management tool, and general business management tool. We also provide IT and strategic business consulting and as program management.

g) Our company is a global drilling contractor operating in 18 countries and five continents, which started in 2006 in North Bay with two people, and then grew to about 75 people in Year 2. We now employ 25 in our office and 150 field crew. My goal is to consolidate international logistics from France to our North Bay office, which would create a lot of new jobs, including ICT positions. This would result in a huge economic spin off to Northern Ontario suppliers. Our buying power would be incredible because we would service our own rigs, buying all our supplies from Northern Ontario companies.

h) The whole government organization employs 1,100, and my division employs 125 and just announced acquisition of Sault Ste. Marie public utilities corporation, so there is growth. In terms of IT, we employ 18 full-time staff.   In North Bay, we provide primary help for internal IT customers and home Internet users.

i) We have offices around Northern Ontario: Sault Ste. Marie, Timmins, North Bay, Sudbury, and Thunder Bay and an office in Bellville. We are growing, and have recently added six positions to the business recently. Right now, we have four full-time staff in North Bay plus six people in the call centre and are looking for one more person here and 20 people for our Sudbury office.

j) Our company has grown from 10 to 11 over the last six years, and we do not anticipate any growth. We're comfortable with our size for now.

k) We have 13 staff in our North Bay office and many staff in various cities in Northern Ontario. We will be hiring at least two staff locally next year – trades people and possibly an IT staff.

l) We formerly had 10 IT full-time staff, but now we have been reduced to two. Because IT is not our main business, we outsource more of that work, so our IT staff cohort will not grow.

m) We employ about 50 full-time IT staff, and our turnover is extremely low in North Bay. We have a very stable office staff here. Movement happens more internally. We very seldom look for staff for North Bay.

n) We employ 13 IT staff full time plus a couple of temporary staff. Growth has been static lately. Our turnover is low; although, we do lose people to better paying jobs.

o) We have an IT section and a bookkeeping section in our business. With 10 full-time staff, 5 of them IT, we have no plans for growth.

p) We typically experience low turnover. Of our 40 full-time staff, nine are IT staff - four computer technicians, three car installation technicians, and two home-theatre installation technicians.

q) We have no growth plans and have zero turnover. My partner and I engage five to six contractors regularly.

r) Our head office is in Sudbury. Here in North Bay, we have zero turnover – the last time I hired an IT person externally was about 10 years ago because I hire internally first and train them.

s) We are working towards growth but I couldn't say what I anticipate that to be.

t) I sometimes hire contractors.

u) We plan on hiring more contract staff.

v) We are looking to stay the same.

w) We definitely plan on growth with our refurbished-components line.

x) We have no plans for growth and are facing declining enrolment over time.

y) We have no plans for growth.

2. What skills do you look for in ICT staff? What positions are difficult to fill and why?

a) I look for graduates of computer programming for my IT business, people with basic skills who I can further train. I also need mining engineering individuals, or ones with degrees in math, preferably Masters degrees. I am currently looking to fill the following positions: Application Developer, Senior Data Warehouse Analyst, and Senior SQL Server Database Administrator. I hire people with programming experience or ones who love to program and train them for more specialized positions and work. Programmers are difficult to source now that Canadore has dropped its CPA program, and Nipissing University has limited graduates. We need one healthy program, not two weak ones.

b) Our work is highly specialized, so I hire graduates who fit our business culture and can learn – people with a technical base we can educate ourselves. Right now, we want to hire someone with an electronics background for sales and tech.

c) I only have four IT staff, but I recently let one go, so I am looking for a replacement. Because I have a mining-engineering company, I do not typically have IT shortages, but I am always looking for mining engineering staff and have to source them in Sudbury because Nipissing does not have a program here. What I have created, though, is an industry-education model, which could work in a number of sectors.

d) We tend to hire account managers and programmers, at least one or two yearly. For support services, we hire accounting or business school graduates. We have the greatest difficulty hiring programmers. We have hired a few from Canadore but

lack that now that the college has cancelled the CPA course and changed to teaching mobile and i-phone applications. Now, we find their grads lack the basics in database structure and back-end logic. On the programming side, we have not hired any graduates from Nipissing University's computer degree program, but we would be very interested in learning more about their grads. We need a mixture of both Nipissing University and Canadore College graduates.

e) We have low turnover, but we always need tech support – entry-level help desk staff. We occasionally also hire work-crew lines men, employees who install wiring and programmers. Overall, we look for medium computer skills, good verbal communication skills, and problem-solving skills. Anyone with a programming background will have an advantage in gaining a job here. Programmers especially require that background.

f) As we grow our custom software business, we look for Java programmers and young grads with SQL. My next hires I would hope would be from Canadore if they re-instate CPA. Without it, hiring new staff may be a problem. I also like Nipissing grads, but these ones I need to have experience rather than hiring them straight from education for strategic business services.

g) For our new international logistics office, we are starting to build IT infrastructure in house. At minimum, we anticipate our workload with double because we ship to so many countries. Our IT staff and infrastructure will be crucial. Right now, we hire local consultants, but if we win the international office bid, we will hire a full-time IT specialist to design business practices here to be more efficient and profitable and a full cohort of IT support staff. That IT specialist will train IT grads fresh out of college.

h) We hire to fill in gaps when people retire, not necessarily related to growth in our corporate services.

i) Over the last three years, we have hired technicians, but we have shrunk the North Bay office call centre through attrition and grown the Timmins office. We are currently looking to hire one person here for the call centre. All our technical work is done in our Sudbury office, and they are currently looking for 20 staff across all job categories. In the past, I have hired Canadore programmer grads, but now they seem to be in short supply.

j) We have exceptionally low turnover, so we are not looking for staff or any specific skill sets we do not already have.

k) We require networking and programming skills. I was highly disappointed Canadore College cut the Computer Programming Analyst and the electronics programs. Seven of my 13 employees graduated from Canadore.

l) That is not applicable since we are not hiring in the ICT sector.

m) We have no shortages here in North Bay and are not actively hiring now – we are downsizing across the Ontario government. We have caps on. Outside of full-time staff, we engage consultants – mostly from Toronto in highly specialized areas such as dot.net arena developers and project managers, etc. They are not available at businesses such as Stroma Consultants or Collective Minds; however, we do keep in touch with them when opportunities arise.

n) We look for programming skills, although not as specific as some companies such as FDM4. We want web-related to Microsoft talent because we are Microsoft-centric. We look for mainstream SQL server and SharePoint skills and find them more difficult to get than we would like. These skills are mainstream in Toronto but not as available here due to the smaller number of large employers who hire those skills.

o) We have low turnover in our IT positions, but when we do hire, we look for web-design, programming, and marketing skills.

p) We require new recruits to have expertise in the form of an educational background – skills depend on what type of IT staff we are hiring. We need programming skills for sure and often look for hardware-repair skills.

q) We hire contractors who work well with graphics and ones who have good search-engine optimization skills rather than programmers.

r) I do not have issues with hiring due to our low turnover and our ability to hire from within locally then train them. Right now, I am looking to fill fibre-optic construction and technical-support positions. Installation and repair jobs require hardware skills. Overall, though, I look for trainable grads with networking skills.

s) Networking is a skill we require most. We do not need too much programming skills because it's not our focus – neither is graphics or hardware skills. We require a lot of hardware training, and we send staff away for this.

t) We hire staff who can run wires, install cabling, and perform general hardware work.

u) We look for PHP, pre hypertext processor programming skills, preferably with some design skills.

v) Our turnover rate is higher in our part-time staff. All instructors are specific to teaching. One program we teach focuses on networking engineering, so we look for those skills in hiring for that position.

w) In the past few years, we basically have focused on hardware, so these are the skills we look for in candidates.

x) Turnover is low – one staff a year. Most of our 24 staff are IT customer support technicians. We look for basic IT skills, how to trouble shoot networking problems, operating system, connectivity issues, plus a good understand of today's mainstream operations such as Windows and Mac. We have one in-house programmer whose main skill is Share Point.

y) Our turnover is zero. We have two programmers and a new media developer. In the graphic design area, it is static. Web design is growing, and we hire more for experience than just education.

3. From where do you source potential hires?

a) I hire locally when I can find potential staff with programming and other skills. I find senior IT professionals with large corporate experience are simply not available locally.

b) For local positions, we prefer to hire locally, and then train these individuals to our specific needs.

c) We hire staff from all over. Of course, we prefer to hire locally.

d) We have hired some staff from Sudbury, but for the most part, we hire locally or at least people who are originally from this area because we want people to have a reason to stay here.

e) We tend to hire locally for our North Bay office, but we do have staff throughout the north and hire from within those local regions.

f) We hire locally.

g) Our business plan for expansion mandates that we hire locally as much as possible. We're not interested in having logistical employees from France re-locate to North Bay. We want local recruits.

h) We try to hire locally, sending staff to service over 100 buildings between North Bay and Moosonee. In next 5 years, 25 percent of our staff is eligible for retirement. As IT Manager at Canadore for two years, I found most of my

employees as graduates of Canadore's programs. I think most ICT staff in many local businesses are Canadore graduates.

i) We hire locally when we can. The last time I hired a programmer, I had to get one from Sudbury because I couldn't find anyone here. We are currently looking to fill another administration position here in the near future.

j) We hire locally but are not looking any new staff in the near to medium future.

k) We hire locally and look for graduates from Canadore College. We have offices all over the North and hire graduates locally for those offices such as Sudbury and Timmins.

l) We hire locally when we need staff.

m) We prefer to hire locally.

n) We hire locally.

o) We hire locally and have a number of Canadore graduates on staff.

p) We hire locally.

q) We hire locally but do engage one contractor who lives in Barrie.

r) I first hire internally, then locally, then look to our head office location in Sudbury. Because our main office is in Sudbury, we have a great relationship with Cambrian College and College Boreal who both have great technology programs. Particularly with Cambrian, I just shoot them an e-mail and they send me recruits.

s) We hire staff through local advertisements, and we have low turnover.

t) We hire locally.

u) We hire primarily from North Bay and surrounding areas. Our teachers are graduates from Sudbury.

v) We hire gradates from Canadore. I hope they still teach hardware.

w) We tend to look for experience, but we do hire new grads for customer support. For Tier 2 and Tier 3 staff, we look for experience.

x) It is difficult to hire the right people initially, so we source them where we can.

4. What can the college, university, government, or even region do to help?

a) I was quite disappointed and upset that Canadore College cancelled the Computer Programming Analyst program. I hired a lot of graduates from there. That program provided a good basis from which we further trained our staff.   I recommend Nipissing and Canadore recruit students with a "*North Bay Needs You*" campaign – highlighting the availability of good-paying IT jobs for new graduates. I know it's not the mandate of your research, but the university could also provide mining engineering because we have to hire from candidates from Sudbury since training is lacking here.

b) I don't have any specific suggestions.

c) Industry is moving too fast for some education, such as mining education as but one example. Industry has to train student graduates in everything. Students get a diploma or degree, and then industry has to train them. Take engineers as an example. They first take a four-year degree, working as engineers in training for four years in industry before they become professional engineers. Why not train them while they get their education? To address fast-paced industry advancements and the disconnection between that and education, we created a new model. We didn't study it – in industry, we just do things, and so we started a new miner training program. We learned a lot in working with education and meeting their needs and our own. Based on that experience, I propose **The Full–Op** – an

integrated program between individual companies in an industry and educational institutions. The concept is that students learn through placements and on-the-job training coordinated with required degree and diploma curriculum. Supplemented by courses and testing at the educational institution, the student would be an income-earning employee instead of paying tuition. Part of the wage would be paid to the student while the balance of the normal wage would go to the educational institution as tuition.

Since I'm unsure of current tuition fees, consider this example: We pay a student $10 per hour, without benefits or bonus and an additional $3 per hour to the Educational institution. With 1,800 hours of paid work yearly (reduced hours to allow for school time,) the student earns $18,000, and the education institution earns $5,400. Including burdens, we pay $27,000 yearly per student. Essentially, we would pay for productive entry-level work. Based on this model, we could take up to three students yearly just in North Bay. Government subsidies would not be a governing factor in selecting candidates. It really looks like a three-way win to me. We garner keen and productive employees, educational institutions gain new students who may otherwise not attend their programs, and the students do best, earning $18,000 instead of paying $6,000 per year for tuition, a swing of $24,000 before taxes.

We learned the key to this type program success is candidate selection. We chose the sharpest ones with the best attitudes. For our mining program, we had 400 applications and chose only 20 people – only one person did not make it until the end. The program teaches students to be on time, to perform, and to do a good job – essential soft skills. Mature students are more suitable since the social part of attending school is missing and we require them to show up every day on time. We do not guarantee jobs afterwards, but we typically want to keep them. The bigger issue is losing them to the competition since they also want these trained staff.

d) We hire experienced people but mostly focus on hiring graduates from Canadore College and Nipissing University. I was shocked when Canadore closed the CPA program. Canadore College could re-start it – that would be a big help in getting students the basics, and Nipissing University could connect with us and let us know what skills their graduates have so we could recruit them as well.

e) We do not hire a lot of staff yearly, but if the Canadore would re-instate the programming course that would help. We look for programming skills, help-desk skills, IT business skills, network design, network trouble shouting, and equivalency to Cisco Certified Engineer qualifications both for new hires and for ongoing training within our organization.

f) To Canadore College, I would say please re-instate the CPA program. For the region, I have a 10-year dream for the city – let's become a software development centre of excellence. I have led large organizations including IT in health care world wide and worked with software development in India, where language and culture barriers etc. are prevalent. Here in North Bay, we have a great fibre set up, are three hours from Toronto, can provide services in both official languages, and can offer a great quality of life. Instead of sending software jobs to India, we could create them here – we just have to market it to firms in Toronto and to students as a great source of new jobs. It is being done on a smaller scale in Picton, with an incubation centre and grants for software development. Let's do it bigger. I spoke to Rick Evans about this vision and would like to get people together from

Canadore College, Nipissing University, FedNor, NOHFC, iiON, provincial and federal government, and the private sector on board for discussion.

g) We would very much like Canadore's CPA course re-instated if our North Bay office is successful in becoming the international logistics centre. This is likely to happen because North Bay is the best hub in the world for mining-tool manufacturing.

h) The college needs to provide certain IT skills. I know why the college cancelled the CPA program. It had declining enrolment (7 students last year,) it's expensive to operate, software and equipment need to be current, and it's expensive to keep skills current. IT programs could be resurrected in different forms. While mobile application development is a growth industry and security is a huge area for mobile phones and tablets, we still need students to have the fundamentals. We would be interested in college and university student placements and in offering our real-world experience. For example, math/science Nipissing students are currently working on optimum bus routes in the region using multiple limitations.

We can provide student placements and real-life projects for them. To improve Canadore's IT education, I share (below) an e-mail I sent to Canadore College that I created with my IT Development and IT Operations Managers.

Top IT trends to consider in all college, particularly IT, programs, which we spend time daily on in some combination are:
1. Mobile
2. Social Media
3. Big Data
4. Cloud
5. Security (in areas above)

General IT Skills
- ITILv3 (great if tech grads also had current ITIL foundations certification; not a stretch since it is 2.5 class days plus a 1-hour certification exam)
- Project Management. Every grad should have PM skills and exposure.
- Mobile app and mobile web-site development (all platforms)
- Presentation and interpersonal skills
- Time management skills (how to prioritize)
- More case studies; prepare for real-world problems and creative solutions
- Experience in a business setting including how to dress and act
- Social media

Specific Technologies
- MySQL + at least one other major database platform (MSSQL or Oracle)
- IIS and Apache
- LAMP – Linux Apache MySQL PHP (or Perl, as in our case)
- Open source application development – Joomla, Wordpress, Drupal
- SharePoint including .Net Programming (C#, ASP, VB)
- Linux administration and support (Red Hat specifically)
- Internet Technologies (i.e. DNS, routing and troubleshooting)
- Security: how technologies combine to protect corporations
  1) Firewalls   2) IPS   3) Data Leakage Protection   4) Policy
- New network technologies and hands on practice

1) Juniper/Cisco   2) VLANs and routing   3) Troubleshooting   4) Design
- Virtualization (concepts and specific hands on)
- Shared Storage concepts and techniques (SAN, NAS etc.)
- Focused courses on specific technologies' admin and optimization
  1) SQL 2010   2) SharePoint   3) Exchange   4) Active Directory
- Mobile Management and app design
- Tablet Management and app design

Certifications
- Microsoft Certified Professional
- A+
- Security+
- CCNE (Cisco/Juniper)
- ITIL

i) Currently, we don't really need help locally. In Sudbury, we are looking for 20 people in technical, IT, administration, call taking, and clerical – every division. We are also always hiring in our call centre for emergency services 911.

j) Nothing. We do not anticipate hiring staff any time in the near future.

k) We typically do not hire Nipissing University graduates. We do search for college grads with networking and programming skills. I know Canadore axed the CPA program due to limited student enrolment, but that means they are not getting the word out to students that IT jobs are waiting for them. Canadore is not operating like a business.

l) Nothing. We have no plans for growth or expansion here.

m) We don't need any help at this time since we are not hiring.

n) We look to the university and particularly the college for new grads with high enthusiasm, so I would hope the CPA program would be re-started.

o) We hire Canadore College students, and have hired from different programs such as marketing and programming. We have not hired in a while, so I don't have any suggestions currently.

p) We have hired co-op students and look for Canadore or Nipissing University graduates. Our turnover is low, so I can't think of anything now.

q) Canadore is a great college with top-notch teachers - I graduated from there 11 years ago, and my partner and I both taught there. I worry about the direction they have taken since many companies I talk with hire Canadore graduates and am concerned how they could lure teachers back now that they are gone. We are not alone, although I do not want to disclose company names. Canadore now teaches things such as mobile phone applications that less in demand here as in big cities where there are more large companies. Canadore cut out the meat of its IT education by chopping CPA and network analysis. I wanted to hire a network person from the college, but they had no program. When I tried to hire a graphics person, they did not get back to us for a month – despite our connections at the college. We had zero response – and I'm sure students would love to hear about our job offers. New grads find it difficult to find a new job, and here we are begging to hire one – we just can't get the connections. Overall, we need a better liaison between us and college graduates plus a re-instatement of the CPA and networking courses – with a plug to potential students that they will readily find jobs in the neighbourhood when they graduate. If students only knew about the careers waiting for them, more of them would line up to enroll in college.

r) We have great ties with Cambrian College – all we do is e-mail them and they send us recruits – likewise with College Boreal. We do not have that type of relationship with Canadore, although in fairness, we hire more staff for our Sudbury office.

s) For IT staff, we mostly look for networking skills. Our staff are also required to do a lot of hardware work such as repairs, installations, and shop work. Since there is not a lot of training locally for this, we send them away for it. As a result, I don't have any suggestions for the college and university.

t) Skills I look for are included in the CISCO program, but there are no courses here that teach everything about cable installation – just the basics, so I have to supervise new recruits very closely.

u) I prefer Canadore grads from the multi-media program taught by Instructor Cowcill – I graduated from that program, and it is excellent.

v) Canadore is our competitor, so I don't have any suggestions. We create our own networking graduates.

w) Our business has a good relationship with Canadore, and we e-mail them when we are looking for a graduate.

x) I can't recommend anything right now. In our shop, we deal a lot with virtualization – it's a technology that has been around at least five years. Years ago, candidates didn't have that training – it's now mainstream.

y) While I don't need to hire anybody today, I am concerned that Canadore cut out some vital IT programs. Our two programmers are Canadore computer programming graduates. We typically hire graduates with programming or networking skills or both, so I suggest re-instating some version of that education.