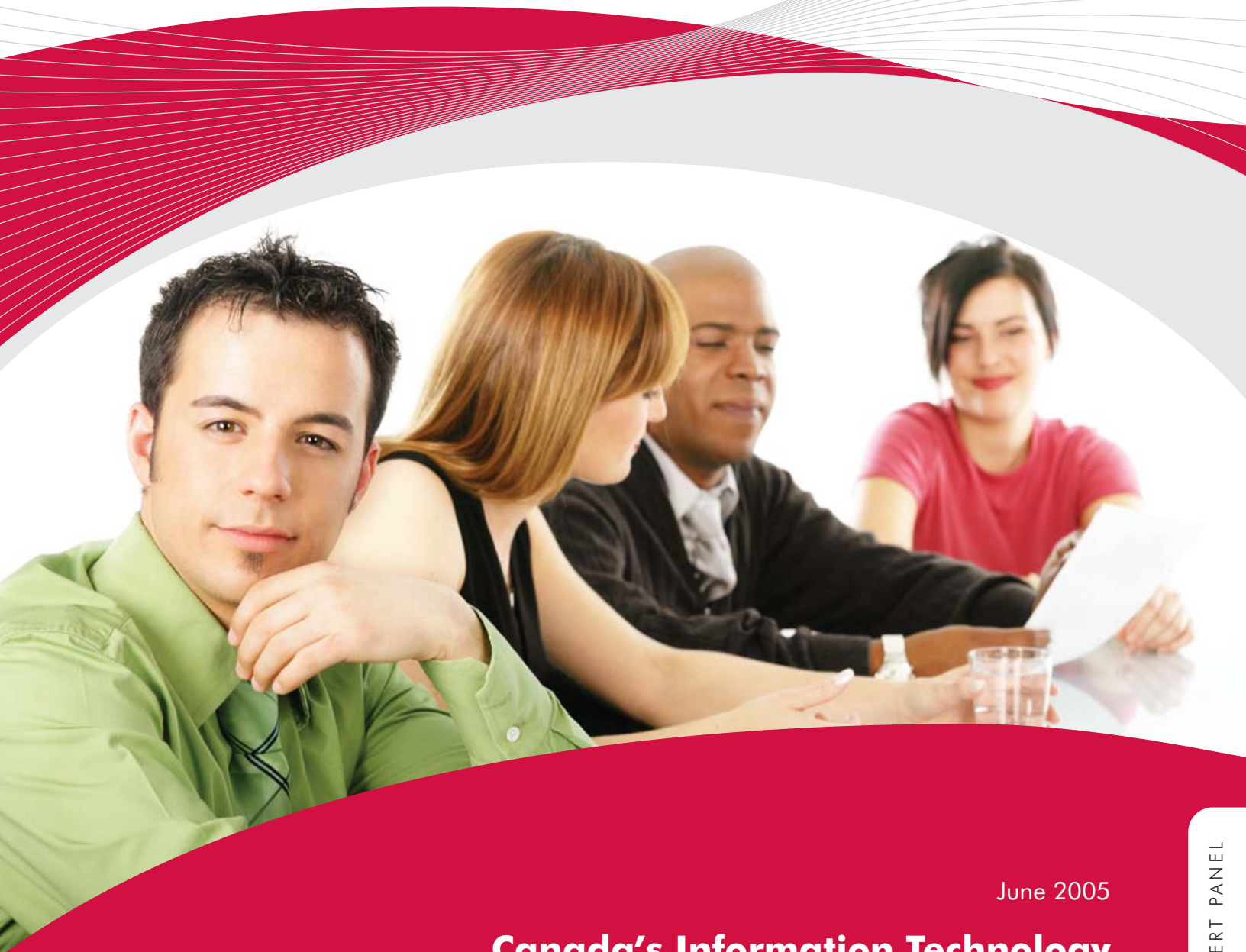




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Canada's Information Technology Labour Market 2005: Issues and Options

Report of the Information and Communications Technology Council Expert Panel

By David Ticoll, Expert Panel Chair

EXPERT PANEL

Table of Contents

Executive Summary	1
Introduction	2
Issue 1: Competencies	3
Issue 2: Technological change, globalization, outsourcing and offshoring	4
Issue 3: The big picture	6
Issue 4: Public perceptions and post-secondary enrolments	7
Issue 5: Career mobility, diversity and equity	8
Issue 6: Education, training, and learning	9
Issue 7: IT and HR, especially in small and medium business	10
Issue 8: Competencies, multi-tasking, and classifications	10
Issue 9: Regional differences	11
Appendix A: The Canadian IT Labour Market Initiative	12
Appendix B: Members	12

Executive Summary

This report summarizes the findings and conclusions of recent Information and Communications Technology Council (ICTC) research, as reviewed and discussed by the Council's Expert Panel of industry, academia and its own staff. Key conclusions are summarized below.

- The Canadian labour market has performed well in response to an upsurge in demand for IT skills. At the same time, too many Canadian IT workers (as in many other technical disciplines) lack sufficient leadership, interpersonal and/or business management skills. And a surprising number need more training in core IT skills.
- Outsourcing and offshoring have big implications for Canadian IT labour markets. Canadian companies are increasingly outsourcing IT services to domestic and offshore providers. In parallel, a growing Canada-based IT outsourcing industry services domestic and foreign clients, though Canada has sold far more call centre services to other countries than sophisticated IT work. For employees and outsourcer employers, jobs at outsourcing firms represent new kinds of career opportunities – with correspondingly different skill requirements. Opinions vary on the current and future nature and extent of these changes. More research and ongoing data collection are needed.
- Over the past few years Canada's IT vendor community shed some 100,000 jobs – and these were taken up by IT "user" firms in various industries across the economy. This massive shift illustrates how quickly things can change in this industry. Such a shift could happen again before the end of the decade. The Expert Panel believes there is a need for holistic, forward-looking research and analysis that brings together the big picture on software human resource labour market opportunities, risks, and development strategies.
- Post-secondary enrolments in IT have been in decline for a few years, seemingly because the field has lost some of its luster in the eyes of Canadians. Meanwhile, China and India graduate IT professionals in the ever-growing hundreds of thousands. We present two key conclusions:
 - If Canada it to be competitive globally, it will need an IT-capable, innovative workforce. Conversely, if it is to attract young people into IT, Canada needs to articulate its strategic position with respect to IT in the economy of global knowledge work.
 - Public perception must be turned on its head. Students, parents and teachers need to understand that the "next generation" IT professional embodies "the package" – business subject matter expertise, interpersonal and organizational skills, and personal qualities. This in turn will make the field more attractive to more people with a wider diversity of talents and aspirations.
- For plugged-in employers and employees – apparently the majority – Canada's IT labour market seems liquid and efficient. However Aboriginals, other visible minorities, people with disabilities, and women tend to have less access to the informal networks that grease career mobility. Only 27% of the IT workforce is female, and the only categories of IT jobs they dominate are technical writing and graphic design/illustration. Significant pay gaps exist for women, people with disabilities, and Aboriginals – though not for other visible minorities. Canada's IT industry is taking some – but not full – advantage of the country's diverse population.
- IT workers are highly educated and apparently have an insatiable thirst for continuous learning. But significant unfilled gaps remain in personal, interpersonal and business skills and knowledge. Post-Secondary institutions in Canada are delivering great IT training but bad liberal arts training, or vice versa. This doesn't create the 'total package employee' that employers will increasingly need due to changing market and technology conditions.
- IT managers are beginning to see that their toughest problems are not strictly technical. Their overarching need is to develop an organization equipped to satisfy their firm's business needs. This is largely a human challenge. Yet in many IT organizations today – particularly in the 90% of businesses that are small and medium-sized – managers and leaders are not chosen for or developed systematically for these capabilities and tasks. Human resources disciplines are frequently undervalued.
- Employers and employees often disagree when it comes to describing the jobs that IT employees do. Meanwhile, multi-tasking among IT workers is very high. Most companies are clear about titles, even in relatively creative occupations such as those in marketing. Yet in IT, job definitions seem all over the map. This is problematic. Occupational definitions signal to employers and employees the core qualifications that are needed to perform a job function. They provide guidance to trainers and educators. An industry member of our Expert Panel would like to see more, richer occupational definitions that include business and organizational competencies.

Introduction

This report provides the conclusions and recommendations of the ICTC's Expert Panel's that followed its review of three of the Council's recent research projects:

- The National Survey of IT Occupations by Morley Gunderson, Lee Jacobs, and Francois Vaillancourt (April 2005)
- Trends in the Offshoring of IT Jobs by Prism Economics and Analysis (April 2004)
- Recruiting, Retaining, and Developing IT Staff by Ken Rifkin (March 2004)

The Expert Panel is mandated to contribute to the understanding of the Canadian labour market for IT occupations with the goal of helping to achieve favourable outcomes. These outcomes include overall growth of the market, high value jobs in particular; ensuring that the capabilities of IT personnel match changing employer needs; and that transitions in the marketplace occur with the lowest possible cost and deliver the highest possible value to employers to employees. The Panel does its work by:

- Drawing implications from available data for stakeholder policies and strategies (stakeholders include employers, employees, industry organizations, education/training institutions, governments)
- Reviewing and commenting on ICTC methodologies
- Identifying data gaps
- Commenting on data reliability/validity
- Speculating on future market developments, impact on scale, skills, education/training, career paths, human resource practices, etc.
- Monitoring progress on
 - Research
 - Implementation of labour market strategies

Expert Panel members include senior IT human resource professionals of leading Canadian companies; research report authors listed above; and ICTC staff and board members. (For details on the members, see Appendix B.)

The Panel met three times to discuss the reports and their implications. Its discussions reflected the seasoning and real world expertise of its members; particularly useful were the contributions of its industry members, who validated and extended many of the research findings and conclusions.



This report presents the outcomes of these discussions, while drawing on the research results. Its main headings and topic areas reflect the Panel's discussions. They are presented here in priority sequence, according to the views of the Panel:

1. Competencies
2. Technological change, globalization, outsourcing and offshoring
3. The big picture
4. Public perceptions and post-secondary enrolments
5. Career mobility, diversity and equality
6. Education, training and learning
7. IT and HR, especially in small and medium business
8. Competencies, multi-tasking, and classifications
9. Regional differences

For each theme we provide here a discussion of the issues as well as options for further research and potential ICTC initiatives.

We recommend that readers review the above listed research reports (available at www.ICTC-CTIC.ca) for more insights.

Issue 1:

Competencies

The Canadian labour market has performed well in response to an upsurge in demand for IT skills. At the same time, too many Canadian IT workers (as in many other technical disciplines) lack sufficient leadership, interpersonal and/or business management skills. And a surprising number need more training in core IT skills.

We seem to face a serious and possibly growing training gap between the skill upgrade goals of individuals and employers' willingness or perceived need to invest in upgrade training.

The national survey of IT occupations queried employees and employers on the importance of three kinds of skills, namely

- Personal/interpersonal skills (teamwork, oral/written communication, leadership)
- General IT skills
- Business management skills

In addition to technical skills, what emerged repeatedly is the critical importance of interpersonal communications, teamwork, project management, and leadership. Indeed, 85% of employees said that personal/interpersonal communications are important or very important in their jobs, compared with 58% for general IT skills and 45% for business management skills like time management, planning, and project management.

On average, across some 31 specific topic areas ranging from leadership to systems maintenance, an average of 25% of private sector respondents reported they need more training. High numbers said they need to learn more core IT skills: programming (41%), design (36%), system administration (31%), and system operations (30%). Besides technical topics, employees said they need more training in project management (39%), planning (31%), people management (31%), time management (30%), and leadership (29%).

The survey was corroborated by case studies and focus groups, which led us to conclude that those IT workers with the greatest career potential have what we call "the package". These employees are in short supply and enjoy premium compensation. The "package" combines technology skills with:

- Business subject matter expertise, experience, acumen, and strategic thinking
- Interpersonal skills like teamwork, communication, and leadership

- Organizational skills including project management and the ability to navigate across boundaries inside and among firms
- Personal qualities such as entrepreneurialism, creativity, initiative, "adaptiveness", and flexibility

As one industry member of the ICTC Expert Panel said, "Technology skills are just the table stakes." Another commented, "As a bank, we want people who have an ability to think about financial services. We need specialists, like derivatives programmers."

Options

Research topics

- An assessment of upgrade training opportunities and gaps in the system.
- "How to turn philosophers into programmers." What skills non-technical people have that IT can capitalize on.
- The trend towards increasing demand for business-savvy IT workers. How to create a supply.
- Impact of the convergence of software and hardware industries on skill requirements.
- Recommended practices for educators, employers and employees for IT competency development.

Potential ICTC Initiatives

- Conduct a program to retrain managers, perhaps in conjunction with community colleges.
- Continued promotion and adoption of the Occupational Skills Profile Model (OSPM) as the Canadian IT Occupational Standard.
- Partner with post-secondary institutions to integrate personal/interpersonal skills in their programs.
- Promotional campaign focusing on the "package" with partners such as employment agencies, industry associations and employers: communicate to parents, educators and students that IT careers are "not just about technology any more".
- Expand the OSPM to include interpersonal skills and business skills, as well as the addition of new and emerging occupations on an on-going basis.

Issue 2:

Technological change, globalization, outsourcing and offshoring

Since its earliest days the IT industry has been in a state of constant, unpredictable change. It has confounded the predictions of its own leaders time after time. In 1943 IBM Chairman Thomas Watson said "I think there is a world market for maybe five computers." Microsoft founder and CEO Bill Gates said in 1981, "640 [kilobytes of computer memory] should be enough for anybody." (Today's typical personal computer houses 1000 times as much.)

Changes in technology have also changed the organizations of IT suppliers and users. In the 1970s costly mainframes gave rise to "service bureaus" which rented

computing power to big companies on a "timesharing" basis. Personal computers and standardization of "server" technologies killed timesharing. During the 1980s companies built large and diversified in-house IT departments to save money and gain control over a competitive resource. Now, several converging technological, organizational and economic factors are in the process of driving new changes in the organization of IT – and, as a result, changing demand patterns for IT human resources:

- The rising supply of productive capacity, including physical plant and especially low cost, highly educated labour forces in emerging economies
- Globally pervasive, low cost information and communications technologies, which make it possible to easily distribute work and collaborate across time and space
- The modular disaggregation of goods, services, and business processes, which facilitates the rise of specialized contributors to global supply chains – in other words, outsourcing of IT services and IT enabled services (also known as business process outsourcing)
- New technologies like Web services and advanced software tools, which dramatically improve:
 - IT departments' productivity
 - The ability of business end-users to actively participate in – sometimes take over – the development of applications
- The rise of new firms and commercial initiatives (notably India's Nasscom and China's government-supported companies) which are disrupting the historic dominance of OECD-based global IT firms

These changes have big implications for Canadian IT labour markets. Canadian companies are increasingly outsourcing IT services to domestic and offshore providers. In parallel, a growing Canada-based IT outsourcing industry services domestic and foreign clients, though it has sold far more call centre services to other countries than sophisticated IT work. For employees and outsourcer employers, jobs at outsourcing firms represent new kinds of career opportunities – with correspondingly different skills requirements.

Said one representative of an outsourcing firm, "As we absorb people from other organizations we need to get them to change their behaviour and become more specialized – so we constantly need to train them. The employee comes in as the 'big super helper' doing multiple



jobs, not a thought leader in any one area.” Said another, “We need people with technical, managerial, leadership, sales and support skills, as well as industry skills and experience. The need for and complexity of the ‘total package’ has grown.”

It remains to be seen how many Canadian IT jobs will migrate to lower cost economies like India and China. Opinions vary on whether job migration will be limited to routine activities or extend to more complex work. Anecdotal evidence suggests that the migration of routine jobs has already somewhat depressed the availability and compensation of entry level IT jobs. There is a risk that a declining entry-level labour pool today will limit the quality of tomorrow’s IT management cadre. Surveyed employers cited lack of experience as the single biggest deficiency in new employees, so a constricted entry-level pipeline could make this problem worse.

More broadly, rigorous researched data is lacking on these issues. We don’t know whether – or under what conditions – Canada’s IT services industry will be a competitive winner or loser from technological change and globalization. Nor do we know the implications of various strategies and scenarios for the optimal development of Canada’s IT labour markets.

This phenomenon is complex. A member of our Expert Panel has a daughter in British Columbia who teaches at a community college; she is also on contract to an Indian firm to help produce a textbook for the North American market – on behalf of a client in California.

Options

Research topics

- Impact of upcoming consumer and industry technologies on current employees and new entrants to the IT workforce.
- Trends in the outsourcing and offshoring of IT support functions. Impacts on small, medium and large organizations.
- Differential competency requirements (if any) between IT employees in outsourcing firms and in-house operations. Future growth of IT outsourcing as a proportion of the domestic labour market.
- Best uses of Canadian technological knowledge in the global marketplace. What niches Canada will focus on, and what it will send outside the country.



- How to use offshore sourcing to fill competency gaps in Canada.
- Impact of globalization on all sectors.
- If many of today’s entry level jobs become offshored, how employer needs will change and career paths adjust. How educational institutions (or others) should address these changes.
- How Canada can be a global leader in the technology sector.
- Links between provincial and federal labour legislation, economic development programs, and our ability to be competitive and attract work to Canada.
- Ongoing monitoring of offshoring and its impacts on domestic labour markets.

Potential ICTC Initiatives

- Develop competency profiles for employees of outsourcing firms and include them in the OSPM.
- Conduct a qualitative study on people who have had successful IT careers to determine how to support mid-career changers.
- Provide helpful information resources for those entering or re-entering the IT workforce.
- Create a community-based partnership to rethink and expand the scope of IT co-op jobs. Link to colleges and universities to integrate learning, training, and work experience.

The big picture

As we write this report, there is a growing sense of confidence about Canada's IT labour market. Demand for qualified workers is growing, and there is some sense that we are entering a tight – but not too tight – situation. Pressures are increasing to make it easier for immigrants with IT skills to get into the country and, more important, to make it easier for them to get good jobs that match their skills. These bullish signs are positive, and ICTC certainly supports the need to expand the labour pool and facilitate employment opportunities for new Canadians.

Canada is increasingly seen as a great place to learn and work by growing numbers of workers and firms from around the world. During the past two years several offshore-based firms have established and/or expanded their Canadian operations. Canadian-based IT firms such as Research in Motion, Cognos, ATI Technologies, Nortel, and CGI are all seeing growing demand for their products and services. Canadian firms are in all industries, from health care to manufacturing and retail,

At the same time, there is a sense of foreboding. Although IT spending is again on the upswing, firms are more stringent than ever about keeping the lid on IT costs. New technologies are now combining with the globalization of knowledge work to change the demand profile for IT professionals. And it's not just routine IT jobs that are moving offshore: across the OECD countries, high tech firms in all industries from microprocessor design to pharmaceuticals are shifting research and development work to China, India, Brazil, Russia, and other emerging economies.

Over the past few years Canada's IT vendor community shed some 100,000 jobs – and these were taken up by IT "user" firms in various industries across the economy. This massive shift illustrates how quickly things can change in this industry. Such a shift could happen again before the end of the decade. The Expert Panel believes there is a need for holistic, forward-looking research and analysis that brings together the big picture on software human resource labour market opportunities, risks, and development strategies.

We might well parse the "big picture" into a demand side and a supply side. It is also helpful to distinguish between development occupations and operations occupations.

- For development occupations, the *demand* side drivers are new investment in IT by user companies and by developer companies. For operations occupations, the principal driver is the installed base of IT assets.

Overarching both types of occupations are changes in net exports (the offshoring factor) and technological change.

- On the *supply* side we have new graduates, career changers (perhaps less important now), and immigration. These are offset by retirements and other exits. A significant complicating factor is the degree of mismatch between skill requirements and skill supply, which can cause structural unemployment even when there is buoyant demand.

Options

Research topics

- Elements of a strategic plan for the IT sector, encompassing future issues, challenges and opportunities. Implications for various stakeholders, and their potential responses.
- 3-5 year analysis of IT employee supply and demand. Will Canada have an adequate supply of knowledgeable workers to meet future demand?
- Impacts of offshoring, technological and organizational innovation.
- Should Canada be increasing immigration targets to meet future demand? What kinds of immigrants should we target? Are the current regulations supportive of our goals, and if not, what needs to change?
- Barriers that inhibit private parties from making optimal decisions in these areas (e.g., lack of timely and local labour market information; credential recognition issues; poaching problem with respect to training; poorly informed guidance counselors; lack of incentives within post-secondary education systems to respond to market signals)?
- Pros and cons of various forecasting methodologies. How they relate to various industries and the work of ICTC.

Potential ICTC Initiatives

- Provide input to government policy and program development regarding credential recognition (PLAR), immigrant fast-tracking and special programs, and open mobility in new free trade agreements.
- Participate in Canadian Occupational Forecasts (COPS) on issues of qualitative adjustments.

Issue 4:

Public perceptions and post-secondary enrolments

Post-secondary enrolments in IT have been in decline for a few years, seemingly because the field has lost some of its luster in the eyes of Canadians. Meanwhile, China and India graduate IT professionals in the ever-growing hundreds of thousands.

Perception issues include:

- Familiarity breeds disinterest. Technology has become part of everyday life, just like TV, cars and refrigerators did for earlier generations.
- The field is fraught with uncertainty. First was the dotcom crash. Now it's offshoring. Some of Canada's once mighty IT and communications firms have vanished or run into serious problems.
- Some companies and industry observers treat IT as a "utility", only slightly more interesting than electrical power facilities.

Is this a problem? After all, according to our survey 43% of IT workers started their careers in non-IT fields. As discussed, key deficiencies in the IT workforce are communication skills, business expertise, personal qualities and the like. New information technology tools will make it easier for business analysts and professionals to do many of the things that IT specialists do today. And with outsourcing and offshoring, a lot of unglamorous mechanical work will be commoditized.

Nevertheless, our Expert Panel expressed concern about declining enrolments and the linkage to the issues of public perception. First, if Canada is to be competitive globally, it will need an IT-capable, innovative workforce. Conversely, if it is to attract young people into IT, Canada needs to articulate its strategic position with respect to IT in the economy of global knowledge work. Second, public perception must be turned on its head. Students, parents and teachers need to understand that the "next generation" IT professional embodies the package –business subject matter expertise, interpersonal and organizational skills, and personal qualities. This in turn will make the field more attractive to more people with a wider diversity of talents and aspirations.

Options

Research topics

- Are enrollments actually declining? If so, is there a linkage to funding cuts?
- How to influence all levels of the education system to encourage young people to stay in mathematics and sciences. What needs to change to increase enrollments? Is enrollment decreasing in other sectors as well? Is it a drop in youth population? Is the drop in enrollment cyclical?
- How Canada will compete with emerging markets if enrollments are declining.
- Is there evidence that bright young people are decreasingly choosing careers in IT? If so, why? Is this a systemic problem? What are high school students thinking?
- Skills and attitudes of guidance counselors related to IT career counseling. How much influence do they exert?
- Public perceptions of IT career prospects and opportunities. How they square with realities. For example, are widely publicized privacy and security issues deterring young people from IT?
- Recommended practices for educators, employers and parents for encouraging and developing students into IT careers.

Potential ICTC Initiatives

- Conduct an IT career trade show and/or conference for high schools, alongside university fairs and career expos. Involve educators, employers, and employees.
- Launch a program for grade 7/8 students on fun with IT.
- Educate the educators (from kindergarten to grade 12) about IT and careers in IT. Help teachers use IT across the curriculum.
- Create more industry-supported bursaries for students in IT programs.
- Sponsor a national middle school "spend a day" program for technology jobs and/or develop and support mentorship programs, IT role models programs, and job shadow days.
- Conduct ongoing surveys to monitor enrollment levels of post-secondary institutions that offer IT related programs.

Issue 5:

Career mobility, diversity and equity

For plugged-in employers and employees – apparently the majority – Canada’s IT labour market seems liquid and efficient. Forty-five percent of employees have been in their current positions for less than two years. Average tenure in their previous jobs is 3.5 years; the more educated the respondent, the lower the job tenure, implying that education leads to fast promotions.

The Internet is now the number one source of job information for IT workers. Sixty-five percent of private sector workers rely on Internet jobs and advertisements on employer Web sites; 71% of public sector employees go to government Web sites for job information (half of them also check out private sector job sites). The next most important source of job info for some 60% of employees is informal networks – the personal web that connects people to that next opportunity. Print media still have grounds for hope, with over half of IT workers continuing to use them for job searches.

Employers, on the other hand, say they rely most on a combination of employee referrals, word-of-mouth and informal networking to find new staff. Next in importance is advertising, both on-line and print.

Large employers in particular have this system figured out. Says one: “Informal networks have declined in importance with the shift to online recruitment and applications. We know who and where our prospective employees are and can recruit them as needed.”

This club works well if you are one of its many insiders, but some groups remain on the fringe, to their disadvantage. Aboriginals, visible minorities, people with disabilities, and women tend to have less access to word-of-mouth and personal networks. They depend more on iffy – and less employer-preferred techniques – like formal employer recruiting, personal initiative (presumably unsolicited job applications) and advertisements both online and off.

Only 27% of the IT workforce is female, and the only categories of IT jobs they dominate are technical writing and graphic design/illustration. Visible minorities fare better. They have only 10% of IT jobs across the country. But this includes 31% of the jobs in Toronto, Canada’s largest IT city as well as its most ethnically diverse, 25% in Vancouver, and 10-15% of the jobs in each of Calgary-Edmonton, Ottawa-Gatineau, and Halifax. Though they are underrepresented in management, members of visible minorities are well represented in technical occupations like programming, hardware and software engineering, and data management. Meanwhile, 1.5% of IT workers are people with disabilities, and 1% are Aboriginals (a high of 2.7% in the Prairies).

Significant pay gaps exist for women, people with disabilities, and Aboriginals – though not for other visible minorities. Women are under-represented in virtually all IT professions, and visible minorities in management.

One industry member pointed out that her firm has won international outsourcing contracts on the strength of its diverse Canadian workforce. The Expert Panel agreed that Canada’s IT industry is taking some – but not full – advantage of the country’s diverse population.

Options

Research topics

- Cost-benefit analysis of employment equity in IT occupations.
- It’s been 25 years that enlightened governments and companies have invested in equity improvements. To what effect? Best practices in employment equity.
- How to make employment equity a key labour market development strategy.
- Recommended practices for governments and employers to better integrate immigrants into the labour market.
- Strategy for the aging workforce. How to retrain and retool them, government’s role, cost/benefit. Should we change retirement rules?

Potential ICTC Initiatives

- Broker cross-functional, cross-organizational, and cross-industry secondments to address skill gaps (including public and private partnerships).
- Provide a foreign credential accreditation service for immigrants.

Issue 6:

Education, training, and learning

IT workers are highly educated. Half have university degrees, and another 27% are community college or CEGEP graduates.

They apparently have an insatiable thirst for continuous learning. As mentioned, for each of a variety of topics – technical, personal/interpersonal, and business – one quarter of respondents, on average, say they need more training. This, despite the fact that many are getting it: 40% had received on the job formal training in the preceding 12 months and 69% had received informal training. A study of UK workers shows that IT workers also do a lot of learning on their own, reading books and manuals and practicing new skills at work and at home. Indeed, such self-help approaches are by far the most popular.

Despite all this education and training, it seems that IT workers are not quite receiving the tools they need. The issue is not technical skills. Most IT workers have adequate technical training, which gives them the skills they need to keep on learning in the face of continuous technological change.

But as discussed elsewhere in this report, the unfilled – and toughest to fill – gaps are in personal, interpersonal and business skills and knowledge. Too many post-secondary institutions require of students in science and technology zero to minimal non-technical course choices, not even in topics like project management and business communications – let alone economics, business strategy, marketing, psychology, literature or philosophy. There is demand for such people. A senior human resources executive for a global IT services firm said, “Programmers with the ‘total package’ aren’t easy to find. How can we turn philosophers into programmers?”

Another IT human resource executive pointed out that this problem exists across many specialized fields. Be that as it may, it’s a problem for IT. “What we’re seeing today in IT (among others) is that universities are delivering great IT training but bad liberal arts training, or vice versa. This doesn’t create the ‘total package’ employee and subsequently hurts us, as employers who need employees with broad competencies. It also hurts our global competitiveness.”

Arguably, the demand for IT professionals with the total package will increase, due to a combination of business and technology shifts:

- The business shift is the rise of outsourcing – both domestic and offshore. Outsourcing will increase demand for technologists who are simultaneously subject matter specialists and effective business professionals in their interactions with clients and peers. In businesses that outsource IT activities, the work that remains in-house will be increasingly weighted towards business savvy capabilities.
- The technology shift is the rise of new tools that increasingly “hide” technical complexity and are accessible to ordinary business users. Where complex programming skills are still needed, the work will increasingly be in the form of a rapid paced cycle, entailing frequent interaction with business users. “Power” business users will be technology adept; effective technologists will need to be business adept – just to keep up.

Changing school curricula could be a challenge. At least one academic member of the Expert Panel expressed doubt: “Universities are monolithic and not good at responding quickly to market changes. A university doesn’t have the incentives to keep up.”

Options

Research topics

- Should the emphasis be on new entrant recruitment and training, on retraining for career changers, or on upgrade training for incumbents?
- Role of educational institutions in developing IT skills.
- Who is investing in employee re-skilling? How much do they spend? What are they doing, and is it working?
- Recommended practices for high value co-op programs and internships. How do students who lack co-op get the experience they need?
- Recommended practices for colleges and universities for including leadership, business, organizational and strategic competencies in IT education.
- Recommended practices for designing, implementing and evaluating informal training in the workplace, including self-directed learning.

Issue 7:

IT and HR, especially in small and medium business

IT managers are beginning to see that their toughest problems are not strictly technical. Their overarching need is to develop an organization equipped to satisfy their firm's business needs. This is largely a human challenge. Attracting/recruiting, developing and retaining staff must be seen as core competencies for the organization and its managers. These capabilities are highly interrelated.

Yet in many IT organizations today – particularly in the 90% of businesses that are small and medium-sized – managers and leaders are not chosen for or developed systematically for these capabilities and tasks. Human resources disciplines are frequently undervalued. The HR function, if it exists at all, is often involved in strategic decisions only peripherally; too often it is a junior partner responsible for administrative tasks in areas like recruiting and compensation.

This may be a classic case of Mars vs. Venus. Each side would benefit from learning the vocabulary, methods and techniques of the other, teaming, joint projects and structured processes, and the like.

Options

Research topics

- Payoff to supporting HR efforts of small and medium businesses.
- Impact of good HR management on productivity.
- Recommended practices for IT HR in resource-constrained small and medium businesses?
- Methods for integrating HR with IT to produce more effective IT products and services.
- Methods for identifying and developing future IT managers (within companies and/or academic institutions, co-operative/apprentice programs, etc.)

Potential ICTC Initiatives

- Broaden the ICTC support and resource program, for example by providing a human resource management guides and other supportive materials.
- Create a Baldrige-type award for excellence in IT human resource management.

Issue 8:

Competencies, multi-tasking, and classifications

Employers and employees don't seem to be listening to each other when it comes to describing the jobs that employees do. For example, 44% of data administrators where that occupation is so recorded by their employer also perceive their occupation to be a data administrator. But 14.3% perceive themselves to be data analysts, 14% computer/information systems managers, 5.8% computer/network operators, and so forth. Of 25 positions surveyed, job function agreement between employers and employees exceeded 60% in only nine occupational categories, and 80% in only one.

Along the same lines, multi-tasking among IT workers is very high. Asked to select their areas of work from a list of nine (multiple answers permitted), 40% or more selected each of the following six: software, Web/Internet/intranet, database, network, systems, and hardware.

Does any of this matter? The answer is yes. Imagine if a hospital and a radiology technician each described the employee's job differently. Most companies are clear about titles, even in relatively creative occupations like those in marketing. Yet in IT job definitions seem all over the map.

Occupational definitions and standards are important. When present they signal to employers and employees the core qualifications that are needed to perform a job function. They allow human resource management to decide if and where a person fits in the organization. Occupational definitions and standards also provide signals to employees about what career paths to follow. They provide guidance to trainers and educators. One industry member of our Expert Panel would like to see more, richer occupational definitions (that include business and organizational competencies) – not less.

We can only conclude that occupational standards have not crystallized in the IT sector.

Several reasons may be advanced for this:

- Though now over 50 years old, IT is still a relatively new field, and one that has been in constant flux.
- The multitasking of IT workers gets in the way of clear definitions.
- Much of IT work remains craft-like, and primitively so since it lacks a “guild” of professional designations to give it structure.
- IT and human resources functions are disconnected in many organizations – sometimes even victims of mutual mistrust. So HR rigour, where available, may face obstacles.

Options

Research topics

- Have we gone too far in the design of occupational classifications? Are they too detailed? Are they not detailed enough?

- Should we include business, interpersonal, and organizational competencies in our classification model?
- How to redefine occupational classifications so that job titles and occupations are commonly defined by both employers and employees.
- Compare employment numbers to occupational classifications on an on-going basis.

Potential ICTC Initiatives

- Help to crystallize occupational standards through promotion, awareness and adoption of the OSPM.
- Systematically identify and add new core competencies to the OSPM, including:
 - Business
 - Organizational
 - Managerial/supervisory
 - Leadership
- Apply the OSPM to develop competency profiles for non-IT occupations where IT is important to effectiveness and success.

Issue 9:

Regional differences

It's been suggested that one way for Canada to compete in a world of global knowledge work is to take advantage of its regions. Outside our big cities – whether in the BC interior, the prairies, northern Ontario, the many regions of Quebec, or the Maritimes outside Halifax – we can create wage-competitive IT workplaces with high retention rates. It's been proven, for example, with call centers in Moncton. So why not do the same with IT outsourcing for domestic and international customers? The challenge, says our data, is paucity of labour pools. Typically, employers in these regions have the highest ratios of unfilled IT positions. They are most likely to cite deficiencies – whether in experience or education – in the human capital that is available for hire. And these employers are far more likely than those in big cities to say that their location is a disadvantage to hiring.

Options

Research topics

- Appropriate roles (if any) of a sector council like ICTC in develop policies and initiatives that focus on developing small firms and remote regions.
- What are the unique differences in various regions of Canada?
- What tools and supports do SMEs in rural areas need to attract, recruit, and retain IT employees?

Potential ICTC Initiatives

- Include as much regional data collection as possible in future LMI.
- Identify and develop strong partnerships with regional associations (IT, advanced technology, wireless, health informatics, etc.).
- Foster and promote adoption of a “Centers of Excellence” approach for provincial/regional industry development.

Appendix

Appendix A:

The Canadian IT Labour Market Initiative

The Information and Communications Technology Council, in partnership with Human Resources and Skills Development Canada (HRSDC) and industry representatives, has embarked on a multi-year, multifaceted initiative to gather and interpret labour market information pertinent to IT professionals in Canada. The initiative, entitled The Canadian IT Labour Market, encompasses the following:

1. **National Definitions for IT Occupations** based on ICTC's Occupational Skills Profile Model (OSPM) job stream definitions. These definitions are integrated with the federal government's National Occupational Classification (NOC) and Standard Occupational Classification (SOC) systems.
2. **Surveys** capturing details on employment, retention and training from both the employer and employee perspectives. Joint national employer and employee surveys were conducted by Statistics Canada for ICTC. Results from the National Survey of IT Occupations 2002-2003 were released in June 2005. Pilot employer and employee surveys conducted in 2000 provided details on IT employment in three Canadian industries, including Computer Systems Design and Related Industries.
3. Qualitative research, in the form of **Case Studies** and focus groups examining HR and IT policies and practices within companies that employ IT staff were conducted, and findings were summarized into reports. The research yields a greater understanding of the determinants of the supply of IT workers, employers' demands for IT workers, the relationship between company-wide human resource management practices, and the overall functions of the IT labour market.
4. The **Labour Force Survey (LFS)** In July 2002 Statistics Canada, under contract to ICTC, started recoding labour force survey data for twenty-one IT occupations. ICTC releases this data on a monthly basis, and provides annual summaries of the trends that emerge.
5. The **Expert Panel** assesses and interprets the data gathered for this project, and makes targeted recommendations to industry, educational and government stakeholders. Their policy recommendations aim to assist Canadians seeking IT employment and help the market function better. The panel consists of senior HR executives, leading labour market economists, and researchers from academia and the private sector.
6. ICTC commissioned and publicized additional **Reports** in partnership with other national and regional associations, educational institutions and industry and government partners. These reports focus on the IT human resource issues particular to a region, industry or population segment.

Appendix B:

Expert Panel Members

Carol Ariano

Vice President,
Human Resources
CGI

David Bell

Principal
Human Performance
Catalysts Ltd.

Peter Buddo

Vice President,
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Ericsson Canada Inc.

Cheryl Craven

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IBM Canada Ltd.

Jamie Darch

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Ed Fine

Executive Director
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Public Works and Government
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Morley Gunderson

CIBC Professor of
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University of Toronto

John O'Grady

Partner
Prism Economics and Analysis

Ken Rifkin

Organizational Consultant

David Ticoll

(Expert Panel Chair)

CEO
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François Vaillancourt

Professor of Economics
Université de Montréal

Gabriella Zillmer

VP, Human Resources
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Ex-Officio Members

Kim Guevremont

Analyst
Human Resource Skills
Development Canada (HRSDC)

Lee Jacobs

Project Manager/Labour
Market Specialist
Information and
Communications Technology
Council (ICTC)

Norm McDevitt

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Paul Swinwood

President
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Paul Stoll

Manager
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The Information and Communications Technology Council (ICTC) is a non-profit sectoral council dedicated to creating a strong, prepared and highly educated Canadian ICT industry and workforce. ICTC is a catalyst for change, pushing for innovations that will provide labour market intelligence, life-long professional development and quality education and training for the Canadian ICT industry, educators, governments and the ICT workforce. We forge partnerships that help develop the quantity and quality of ICT professionals needed to improve Canada's position as a leader in the global marketplace.

To achieve its goals, ICTC focuses on four areas that are proven building blocks of a healthy, forward-looking sector:

- **Skills Definition** – defining the skills required to be a professional in the ICT sector.
- **Labour Market Intelligence** – providing up-to-date statistics and analyses of human resource developments in the ICT sector.
- **Career Awareness** – providing programs and tools to explore the career possibilities in Canada's ICT sector.
- **Professional Development** – dedicated to continuous learning for ICT workers so they can maintain and improve their skills sets and increase their opportunities within the sector.

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