

Long (Standing) Digital Divisions: Women's IT Work in Canada

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Abstract

This article explores the concept of "digital divide" as it pertains to women's work in and with IT in Canada. While "digital divide" has some usefulness as an analytical concept for feminist scholars, the complex nature of IT-based work requires a broader and deeper understanding.

Résumé

Cet article explore le concept de la "division digitale" en ce qui a trait au travail des femmes dans et avec la technologie informatique au Canada. Quoique la "division digitale" ait quelque utilité en tant que concept analytique pour les érudites féministes, la nature complexe du travail basé sur la technologie informatique demande une compréhension plus élargie et plus approfondie.

Introduction

Feminists have long called attention to gendered disparities in the creation, use, access to and control of information technology (IT). These types of disparities have often been termed the "digital divide." In this article, I explore the concept of "digital divide" as it pertains to women's work in and with IT in Canada. While "digital divide" has some usefulness as an analytical concept for feminist scholars, the complex nature of IT-based work requires a broader and deeper understanding.

The idea of a "divide" itself connotes an easily demarcated bifurcation, like the zeroes and ones of binary code (Plant 1997). Many questions posed have consequently suggested dualist categories or looked for ways to quantify technological status: Are people in this region "wired" or not? Are women "shut out" of technology or not? Are technological jobs good or bad? Even the technology itself is imagined as some kind of specific "thing" (such as a computer) that can be present or absent in a given context or location, rather than a set of social relations or processes - we might even speak of a "divide" of technologies in which only certain objects count as "technical" or not (Franklin 1999).

The notion of a "divide" has been imagined by some theorists as the fault line of gender (Gillard *et al.* 2007) which, as I have argued elsewhere (Scott-Dixon 2005) assumes binary relations between women and men. To put it simplistically, this model proposes that men create and control technological things, knowledge and communities of practice; women consume and use the things men produce, with little access to the knowledge or the communities (Franklin 1999; Horowitz and Mohun 1998). Relations between men and women define and are defined by their gendered and unequal participation in technology.

More recent feminist research indicates, however, that given the complexity of social relations, a binary framework of men versus women, creators/masters versus users, is limited in its utility. Indeed, much work in the last decade has been done on how gender relations both between and among men and women are constructed in IT-related work spheres (Berner and Mellström 1997; Hafkin and Huyer 2006; Håpnes and Sørensen 1995; Ng and Mitter 2005). Theorists have critiqued assumptions that skill training and access to IT alone reduces social inequalities (Scott-Dixon 2004), and noted that the language of "digital divide" itself often reflects only the needs of IT industry employers - the language of substantive "digital equity" is not spoken (Gillard *et al.* 2007). The underlying conditions contributing to the "digital divide" are rarely mentioned in industry and government discourses that tend to focus on problems such as the possession of formal credentials and skill, "opportunities" and "access" (Advisory Council on Science and Technology 2000). Yet feminist theorists have pointed to a global division of IT-based labour that replicates, depends on and occasionally subverts regional, racialized and gendered disparities (Boyer 2006; Buchanan and Koch-Schulte 2001; Freeman 2000). Not only is gender a complicated, sometimes contradictory, and nuanced phenomenon, but an examination of how it is experienced in the workplace in general, and IT-related workplaces in particular, must also look at other dimensions of worker experience and stratification. These can include (but are not limited to) geographic location, perceived and actual skill levels, immigration status, ethnicity and age.

Sophia Huyer and Nancy Hafkin take up this complexity in their edited volume *Cinderella or Cyberella*, which analyzes the "digital divide" concept in the context of gender and development theory (Ng and Mitter 2005). The "Cinderella" of the title is the disempowered worker who labours "in the basement of the knowledge society" while the "Cyberella" is an "active knowledge creator

and disseminator" whose work with technology is rewarding and empowering (Huyer 2006, 1). While they are concerned with the gender dimensions of the digital divide, Huyer and Hafkin recognize the importance of local, situated analyses that include understanding institutional arrangements, sociocultural attitudes and organizing structures (such as ethnic or caste-based systems), religious beliefs and mores and formal legal regulation of women's status (Huyer 2006). They also point to a broader conceptualization of how information technologies can be used as tools to enhance gender equality and women's empowerment in workplaces, schools, households and communities.

The work of IT itself resists binaries as well. A decade ago, feminist scholars in the field of science and technology studies identified elements such as "hybridity," "rhizomatism," "cyborg" and "actor-networks" that suggested border crossing, interconnectivity and multiple identities as metaphors for analyzing emergent forms of work in the new and increasingly globalized economy (Haraway 1994 and 1996; Plant 1997; Singleton 1996). Despite the popularity of these post-structuralist analytical devices, they have not often been applied to concrete examinations of the labour process and organization of IT work, even though in the intervening years a plethora of IT jobs have been produced that are hybrids in both content and structure (Scott-Dixon 2005). For instance, as Damarin notes when speaking of the collection of jobs related to Web production, in its occupational boundary crossing, collaborative nature and often-contingent employment arrangements, such work "exemplifies many of the flexible practices that researchers have identified in recent years as potentially constitutive of a new paradigm for organizational, industrial, and labor arrangements" (2006, 430). Canadian industry publications report IT hiring in not only traditional high-tech industries such as telecommunications, but also in resources (forestry and mining) and financial/business services, and IT employers report looking for

"combination skills" such as technical, interpersonal and business skills (Lombardi 2006a; 2006b).

Thus, despite the temptation to think that IT-based work reflects logical precision of the digital tools that it uses, such work is, in fact, more organic, diverse, hybrid and interconnected with other social relations in both its content and structure. The "divides," and the lived realities they represent, are digital only in name.

Feminists must therefore approach research on a "digital divide" in a more complex way, using an intersectional and multi-method approach that more accurately represents the diverse processes and practices of IT work in Canada and worldwide. Gender must be combined with indicators of other social locations and conditions of work in order to accurately depict the complexity of the technological work force and the implementation of technological labour practices. Divisions among workers along traditional lines such as gender remain salient and the notion of "digital divide" remains useful as a general guiding principle; yet understanding the multifaceted manifestations of IT work and the complex social relationships requires a more sophisticated approach.

The remainder of this article identifies particular "digital divides" in order to make their explanatory power visible and to expand the notion of what constitutes such a "divide": technology/work, paid/unpaid; good jobs/bad jobs; work/time; and divide/equity. I have chosen the first four "divides" as they represent questions that have long preoccupied socialist feminist, labour and technological scholars; areas that theorists and activists in these fields have both challenged and reified. There are many other "divides" that could be highlighted (for example, insider/outsider or skilled/unskilled). The fifth "divide" calls for a more complex project of envisioning equity by moving beyond a simple notion of divisions. The divides are noted with a slash between them to illustrate their separation as well as their relationship - each divide is connected to its

partner as well as to the other divides. Like technology's webs and networks, the divides are interconnected and interdependent. I explore these "divides" via an examination of women's IT-based work in Canada and conclude by suggesting that feminist scholars must move beyond "divides" to speak more broadly of technological equity as a multifaceted concept, as well as a goal requiring multiple analytical approaches and political strategies.

Technology / Work

Although many notable feminist studies of the gendered character of technical employment have viewed patterns of labour and employment as central (Cockburn 1985; Webster 1996), the turn towards cultural and communications theory in studies of information technology, as well as material produced by industry and government on the "digital divide" has often focused more on the question of technology rather than the question of work (Rodino-Colocino 2006). As a result, diverse occupations have sometimes been lumped together by virtue of the objects, such as computers, that they use to perform daily tasks or because of their status as "symbolic analysts" or "knowledge workers." The proposed solutions to "digital divides" may be technological (e.g., putting computers in classrooms) and skill-based (Advisory Council on Science and Technology 2000; Gillard 2007; Rodino-Colocino 2006).

But what is meant by "IT work," specifically? What types of occupations could be said to be "IT jobs"? Here I use a "life cycle" or "ecosystem" model of IT work that identifies relationships between IT jobs as important. In other words, I propose that IT-based jobs include not only highly skilled, male-dominated, professional service work based in engineering and computer science (although these are, of course, significant) but also lower-skilled, female-dominated, paraprofessional, production and labouring work such as data entry, IT administration and electronics assembly and disposal. High-end work depends on low-end work for its sustenance; low-end work depends on the

demand generated by high-end work. All types of work also depend on the exploitation of pre-existing social inequalities. Thus, like an interconnected ecosystem, IT work is really a set of relationships between diverse occupational species situated within a particular environment.

Most IT work in Canada remains male-dominated particularly in professional occupations such as software engineering. While women's participation in many previously male-dominated fields has drastically increased, their presence in certain technical fields remains surprisingly and consistently small (and in some areas such as computer science, is in fact declining) (Babco and Ellis 2003). Explanations have suggested the stereotypically masculine, "nerdy" character of technical skills and education, the absence of female role models and the male-dominated workplace as reasons for women's absence in senior and professional IT positions (Stager 2002). However, less research has focused specifically on how the patterns and arrangements of IT work reflect broader trends in the labour market or in the arrangement of work. In other words, theorists have often focused on the gendered content of IT work and technology use rather than its underlying structure and organization (Beyer *et al.* 2003; Rose 2003).

Figure 1 provides a list of IT-based occupations and their gender/immigrant composition. I have organized occupations by category and seniority, based on typologies developed from earlier research (Scott-Dixon 2004).¹ A number of conclusions can be drawn from Figure 1: First, the IT workforce remains largely stratified by gender. As the seniority, status and formal skill level of a given job increases, women's overall presence tends to decrease. Women make up the vast majority of IT-based clerical occupations; men make up the majority of IT-based management jobs. Certain occupations, such as web design and database administration, have also become devalued and deskilled as women have moved into them.³ However, interestingly, women are making inroads into some

management positions often entering from other ostensibly non-technical fields such as business administration (Scott-Dixon 2004).

Second, being an immigrant has different impacts on men's and women's jobs in IT. Although there are many immigrant men in electronics manufacturing (both as labourers and supervisors), they are also well represented in IT management and other highly skilled IT professions such as software and computer engineering. Immigrant women, in comparison, are more often found in jobs such as electronics assembly labour and data entry, two types of jobs known for occupational health hazards, repetitive tasks and often rigid monitoring of work (for example, tracking keystrokes). This reflects a division of labour based on gender, racialization and migration status that is reproduced worldwide (Freeman 2000). While skilled immigrants to Canada often have difficulty getting their credentials recognized, the effects are not distributed equally by gender (Boyd and Thomas 2002; Dryburgh 2003). Employers consistently draw on ideologies of class, race-ethnicity, gender and nation to contend that they hire women from particular ethnic groups for electronics assembly because they are reputed to have excellent manual dexterity for working with circuit boards (Pellow and Park 2002). In this understanding of racialized immigrant women's occupational identity, although they create the fundamental components that are required for knowledge work, they themselves are not seen as knowledge workers, but simply labouring bodies.

Finally, the chart suggests the heterogeneity of IT-based occupations. While all occupations involve the same information and communications technologies, they do not do so in the same way. Electronics assemblers and data entry clerks have plenty of "access" to IT objects - perhaps many data entry clerks wish at the end of a long day of typing that they had less access - but such access is not organized in the same way as an engineer's or programmer's "access." Thus, the "digital divide" is as much about "occupational divides" organized around

dimensions of skill (perceived and actual), gender, race-ethnicity, immigrant status, age and region of work than any element particular to the technologies themselves.

Paid / Unpaid

Although women make up nearly half of the paid workforce, they remain the primary unpaid labourers of their households, performing a disproportionate amount of domestic and caregiving work (Census 2001; General Social Survey 2005; Zukewich *et al.* 2000).⁴ Neither this gendered division of labour nor the demand on time has changed very much despite a vast array of improvements in household "labour saving" technologies (Leonard 2003). Women are more likely than men to identify too many demands and hours; "family" and their household work being unappreciated as sources of stress in their lives (General Social Survey 2005; Shields 2004; Williams 2003). However, more men than women are likely to describe themselves as workaholics regardless of whether they have children. Thus, the pace, demand, intensity and arrangements of paid and unpaid work are likely to have particular gendered manifestations and effects.

This organization of labour has implications for IT work. While many large North American IT employers offer perks for their employees, child care is eschewed in favour of things like free lunches and fitness and recreation facilities (Figure 2; Drolet and Morrissette 2002). This workplace organization suggests that the only other time demand on employees would be recreation and leisure activities rather than care or domestic demands. Even the appealing notion of "flexibility" in practice generally means that either employees have the "freedom" to work at 3 am or that the IT workplace culture and employer demands prevent workers actually using that flexibility to meet other responsibilities or set limits on work hours (MacEachen and Polzer, in press).

The disparate responsibility for unpaid work affects not only women's time

use and wellbeing, but also their options for paid employment. The section below on time use examines mores of working time in professional IT occupations and the implications for women's work.

Good Jobs / Bad Jobs

In the past few decades, theorists of work have raised concerns over the quality of employment in the so-called "postindustrial" economy and pointed to the division between "good jobs" and "bad jobs" as a defining feature of the recent changes in employment patterns in industrialized countries, including Canada (Duffy *et al.* 1997). IT-based jobs have often been viewed as "good jobs": highly skilled, well-compensated professional occupations staffed by workers who are able to freely choose rewarding, stimulating labour (Gillard *et al.* 2007; Kunda *et al.* 2002).

Indeed, labour codes and professional practices in areas with a high concentration of IT workers may reflect the assumption that since IT work is so stimulating and well compensated, and organized around a "free agent" employment model in which highly qualified workers sell their expertise and services to the highest bidder, workers do not require legal protections such as regulation of their overtime (California Labor Code s.515.5). The Canadian Advanced Technology Alliance (CATA), an industry group, argued that sections regulating overtime in the *Ontario Employment Standards Act* for such high-tech workers as electronics engineers and systems analysts should be repealed because the *Act* "regulates work practices through a punch clock and 'entitlement focused' approach, an application which conflicts with the 'self-directed', 'entrepreneurial' culture of high-tech industries" (CATA 2000). Moreover, the submission notes, "these individuals take a vested interest in the company's success and often times, to move forward, should be called upon to work the hours required to realize their gains." Such a push towards relaxing employment standards legislation for particular groups of workers, combined with global labour market trends favouring

contingent employment arrangements, has meant that professional IT workers in North America are presently faced with the increasing "flexibilization" of their jobs, including cyclical layoffs or contract-based hiring, "outsourcing" of work to regions where labour costs are lower and a lack of collective recourse for declining working conditions.

Vosko and others have drawn attention to the multidimensional nature of the phenomenon of precarious employment, a complex manifestation of worldwide shifts in labour market trends, gendered and racialized patterns in paid and unpaid labour, and institutional regulation, all of which are also intimately linked to household structures and distribution of resources. Precarious employment reflects "continuity through change" (Vosko 2006, 4) in that traditional social and economic inequalities remain persistent organizers of work although the nature of the work itself shifts historically. Thus, while work has always been "precarious" for many groups, such as women, youth, and immigrant or racialized workers, the move towards the "postindustrial" global economy, facilitated by advances in information and communications technologies has resulted in new forms of old inequities.

Although IT-based occupations have typically been imagined as "good jobs," this work is increasingly precarious. In the case of IT employment in Canada, while women have made slow gains in some areas, they have lost ground in others. In many areas where women have increased their numeric presence, the quality of work has either concurrently declined or resisted improvement. IT industries, particularly in the United States, have moved to reclassify many groups of IT workers as "independent contractors" rather than standard, full-time, permanent employees, which has the effect of reducing their legal and regulatory protection and rendering their jobs more precarious (Fudge and Vosko 2001; Kunda *et al.* 2002). Many of the jobs where women have made inroads are lower-paid, more contingent, "flexibilized" occupations and fields, such as

Web design (Damarin 2006) or technical support in call centres (Buchanan and Koch-Schulte 2001; Patel 2006). While many IT jobs are still "good jobs" that offer opportunities for interesting, creative, well-paid work, in practice this advantage has not materialized for many female IT workers.

Work / Time

IT has enabled us to change our notions and practices of working time (Franklin 1999; Youngs 2001). It has altered the arrangements and boundaries between paid and unpaid work (as discussed above) as well as leisure time (Bryce 2001; Habib and Cornford 2002). It enables work to be done asynchronously, constantly, rapidly, and in a regimented fashion. It has increased the possibilities for non-standard working time, and the demands for speed and pace of work, as well as employee availability through tools such as cell phones, PDAs (Personal Digital Assistants), and pagers. It has the potential to expand and contract employment and leisure time through telework: the worker may save time commuting or set his or her own hours, but may also be expected to do work at any time of the day. However, technologies alone cannot accomplish these effects without the aid of human intervention. Changes in working time serve primarily social and economic, rather than technological, objectives. Although technological innovations increase what can be done, it is employment practices and employer expectations that dictate what should be done.

Time use - of all kinds - is gendered. The ways in which men and women experience and utilize time differ. Time use and the perception of working time also have different social meanings depending on gender (Kalleberg and Epstein 2001). Traditionally male-dominated fields, such as technical professions, have often defined themselves not only in terms of who does the work, but how and in what way. Historically, a defining feature of technical masculinity was a grueling work schedule that was physically and intellectually demanding (Evetts 1994). This was intended to exclude not only women,

but also men who could not measure up, either ideologically or practically, to this rigorous norm (Berner and Mellström 1997).

Norms, ideologies and practices surrounding working time pose various challenges for female IT workers: working time can define IT as a masculine domain, contribute to job and employment strain, be a characteristic of precarious work, impede women's participation and advancement, and increase time stress for women. This situation is particularly poignant given that IT holds significant potential for the transformation of working time. IT can provide work flexibility for employees, and the ability to tailor unique work schedules to each worker. However, to date, this promise has failed to materialize despite the possibilities for re-imagining working time and this has had negative consequences for women in the IT workforce (CCWESTT 2004). There is an emerging feminist literature on the gendered character of time use (Fagan 2001) but most of these studies have not directly addressed the IT field. While some attention has been devoted to issues of working time in IT, particularly regarding work flexibility and speed-up, there is less that has explicitly examined working time as a gendered domain that is used to reinforce specific norms of masculinity while excluding women from both professional IT occupations in general, and from achieving senior positions within it (for a notable exception see Shih 2004).

Although all forms of work have been in some way altered by the introduction of technology, occupational structure also plays a role in the organization of working time. The time of salaried professional and managerial occupations is typically more expansive than that of other occupations, such as blue-collar occupations where there is a close link between time and value, as exemplified by the hourly wage. Professional workers in IT often put in long hours as part of their work routine, and the expectation and reality of longer hours tends to increase as seniority increases.⁶ Full-time IT employees, who make up the majority of the IT workforce, not only work longer hours than other workers, they

are also much more likely than workers in other industries to put in unpaid overtime.⁷ In Canada, depending on the occupation, between 80% to 95% of IT workers reported working overtime in 2002,⁸ and on average, unpaid overtime for professional IT workers amounted to just under 6 hours per week (Drolet and Morrissette 2002). A private study commissioned by IBM revealed that all Chief Information Officers (CIOs) surveyed reported working more than 40 hours per week, 34% reported working 50 to 60 hours, and 23% reported working 60 to 70 hours (IBM 2003). Notably, 85% of chief information officers (CIOs) in 2004 were male (IT World Canada 2004), and in all IT professions, the proportion of women drops drastically as seniority increases.

Long hours in IT industries in North America thus often serve to define the field as a youthful, masculine domain where employment prowess is demonstrated by a commitment to extensive hours of labour. This ignores not only "profound asymmetries" in men's and women's time organization as a result of systemic factors (Sirianni and Negrey 2000) but also the poor quality of work and health that can eventually result from repeated time pressures over the long term (Lewchuk *et al.* 2006). Such an ideal excludes those who do not want to or are unable to participate and as such remains a major barrier to women's employment and advancement in professional IT occupations.

Unions play a significant role in protecting workers through collective agreements that may limit excessive hours of work, support regular schedules and shifts, ensure more time off (particularly paid time off), require overtime pay and provide a means to resolve disputes over work practices. Unions provide significant advantages, protection and equity initiatives, especially for workers who belong to traditionally marginalized groups (such as women, youth and workers of colour), and who would otherwise be lower paid and less well protected (Jackson 2005). Union organizing has typically been weak in the IT field and employees in IT industries are much

less likely to be unionized than employees in other industries.⁹ The low rates of unionization in IT industries, combined with the relative absence of a means to objectively settle disputes, mean that IT employees have little power to resist coercive or discriminatory work arrangements and practices and that traditional inequities are more easily reproduced.

Another relevant factor in the context of working time is that of workplace organization. Although there are many large firms, the bulk of IT work is still done in smaller firms and start-ups. Jobs in smaller firms tend to be less secure and permanent, with lower wages and fewer benefits (such as pension plans and sick leave) than those in large firms (Fudge and Vosko 2001). The spectre of employment contingency and job loss can loom large in smaller firms and regulatory protection around issues such as working time is either not applicable or is less likely to be enforced. Additionally, unlike the strict hierarchical structure of manufacturing workplaces, team-based work is a critical element of the IT workplace. Thus, the majority of IT work tends to be done in relatively modest-sized firms that are structured around project teams. While this collaborative work style can have many beneficial effects on productivity and the quality of work, it also means that work success depends on social coherence and adherence to workplace culture and that labour is structured around "project time." Employees within the software industry tend to identify their interests more with a specific project than with the company and networking is a critical element of job security (Kanter 1995). This milieu can result in self-reproducing workplace cultures, demographics and values (Eastman 1998). Thus, those IT firms whose organization provides ample opportunity for work monitoring and evaluation by colleagues, as well as a model of long hours provided by management, are more likely to value and enforce an expanded concept of working time.

Divide / Equity

"The notion of information have-nots," notes Michelle Rodino-Colocino acerbically, "is innovative for serving as a euphemistic synecdoche for what causes and constitutes poverty" (2006, 490-91). Does the ability to access the Internet bridge the "digital divide"? Owning a computer? Who took part in the "buoyant Canadian IT market in 2007" (Arellano 2007) and in what way? Rodino-Colocino, along with Gillard *et al.* (2007) point out the obscured and deeply embedded corporate agenda in discourses of division arguing that the problem of digital divisions is imagined by states and industry as really about the creation of a labour force and a consumer base. The presumed neutrality of strategies to combat the "divide" conceals deep structural inequities in the organization of the global workforce. If feminists are to address the persistent disparities in women's IT labour force participation and experiences, they will not only need to reclaim the conceptualization of "digital divide," but also to speak more broadly of a project of technological equity.

Moving beyond "divides" towards imagining equity requires intersectional and multi-method analyses and approaches that more accurately represent the heterogeneous processes and practices of IT work in Canada and worldwide. "Add computers and stir" is not a recipe for accomplishing women's equality in IT or other forms of work. The goal is not simply to "bridge divides," which implies providing opportunities for the "have-nots" to acquire technical things and join the "haves" in a kind of consumer-based technological utopia. The goal is to re-imagine the nature of technology's interaction with social inequality, to identify technology as one factor in a reinforced web of relationships and to revise the fundamental interactions of power on which such "divides" - along with a host of others - are based.

Endnotes

1. At the time of writing, only 2001 data were available from the Canadian Census. These data were used for their level of occupational

detail which is not available either at this level of detail or crossed with the immigration status dimension. 2006 data on occupation and industry are due to be publicly released in spring 2008. However, more recent surveys such as the 2006 Labour Force Survey which provide gender and aggregate occupation/industry data confirm that women's presence in senior IT-related occupations remains small.

2. More recent occupational data at a comparable level of detail are due to be released from the 2006 Census in March 2008.

3. As one of the IT service occupations with an increasing proportion of women (presently approximately 35%), web design work is an example of this trend. In the mid-1990s, web design was considered akin to high-level programming and as such could command a professional hourly rate. The 2005 *Alberta Wage and Salary Survey* indicates that the median starting salary for web designers and developers is \$12.15/hour. An October 1, 2007 job advertisement for web development on a popular job-seeking website offers \$400 per week for full-time work. Web design is increasingly regarded as administrative rather than technical. It is also now a more precarious occupation: it is likely to be freelance and contract-based, without worker protections, professional associations or benefits.

4. According to the 2005 General Social Survey, 59% of men and 85% of women reported participating in daily core housework (e.g., meal preparation, meal clean-up, indoor cleaning and laundry). On average men reported 2.5 hours per day of unpaid housework while women reported 4.3.

5. Source: Statistics Canada, Survey of Information Technology Occupations, 2002. Includes companies with more than 50 employees in the private sector.

6. While this article focuses on the North American context, the problem of long hours in IT appears to be prevalent in other geographic locations, including Europe, Australia and South Asia. Research on software production facilities in India, for

example, notes that typical working hours were eight hours a day, six days a week, but employees "felt they spent more time than this in the workplace, largely because of tight project deadlines and the need to put in extra hours to meet those deadlines" (Arun and Arun 2002).

7. IT workers worked approximately 44 to 47 hours per week; on average much more than the average 39 (Drolet and Morrisette 2002).

8. Statistics Canada, Survey of IT Occupations, 2002.

9. This varies by national context and industry group. In Canada, approximately one-third of all employees are covered by a union (Statistics Canada 2005). In the United States (US), the national average in 2004 was 12.5% (*Current Population Survey 2004*). Drolet and Morrisette indicate that about 33% of non-IT industry employees are unionized in Canada, compared to 25% in IT manufacturing and 14% in IT services industries. In the US, 5.8% of all computer and mathematical occupations are unionized (*Current Population Survey 2004*).

Figures

Figure 1. Composition of IT Occupations by Gender and Immigration Status, Canada (Census 2001)²

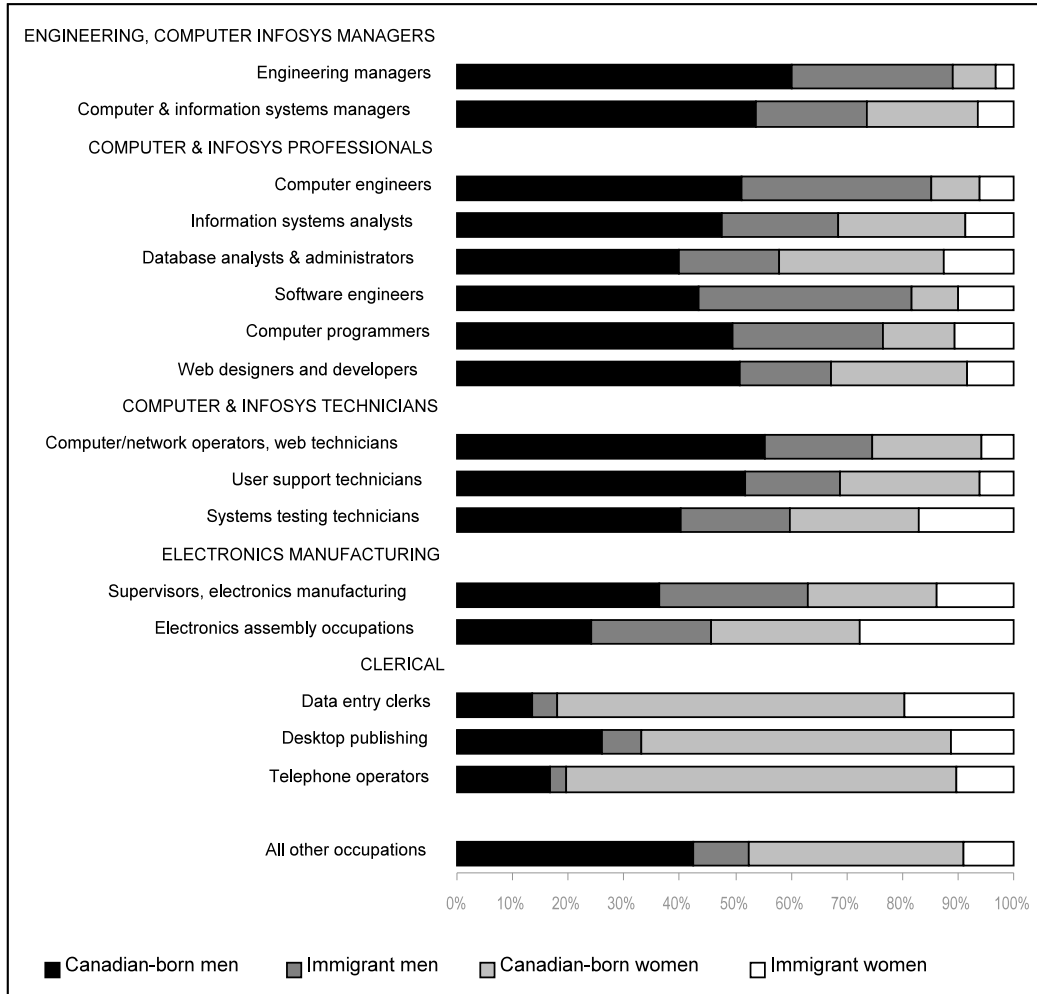


Figure 2. Selected Non-wage Benefits Provided by Employers to IT Workers, Canada, 2002⁵

	Flexible working hours	Option to work from outside the office with employer provided tools	Complimentary beverages and food	Recreation facilities and/or memberships	Day care facilities and/or support
	% of companies providing benefit				
Computer and information systems managers	74	59	42	31	3
Electrical and electronics engineers	55	50	53	88	41
Computer and telecommunications hardware engineers	97	35	16	56	0
Network system and data communication engineers	76	60	62	32	1
Information systems business analysts and consultants	93	86	64	54	31
Systems security analysts	95	53	33	46	4
Information systems quality assurance analysts	78	82	73	24	4
Database analysts	89	65	54	28	2
Data administrators	78	62	64	12	0
Software engineers	92	74	67	38	1
Computer programmers	73	67	40	28	1
Web designers and developers	92	72	58	29	1
Electrical and electronics engineering technologists and technicians	43	45	28	31	1
Computer and network operators	73	52	56	33	3
User support technicians	70	57	42	32	1
Systems testing technicians	79	33	88	39	0

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