STRESS@WORK: AN EXPLORATION OF THE IMPACT OF INFORMATION AND COMMUNICATION TECHNOLOGY ON CANADIAN WORKERS

Dorothy Zalcman Howard

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ABSTRACT

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Communication Technology on Canadian Workers

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Although many assumptions have been made about the impact of information
and communication technology (ICT) on worklife, research on human concerns
and human resource issues in a variety of settings, sectors, and occupational
groups is surprisingly limited. The literature suggests that while new technologies
may offer many benefits, they may also contribute to increased job stress and
strain. This thesis is a multiple exploratory case study examining the ways in
which office technologies contribute to job stress and burnout among executives,
professionals, and clerical-administrative workers in the not-for-profit sector. A
conceptual model drawing on the demand-control model of job stress and the
job-person fit model of burnout was developed and empirically tested. Data were
collected in six organizations and triangulated in 18 semi-structured, in-depth
interviews, documentation, and on-site observation. The study found that ICT
contributes to job stress by creating new expectations that exacerbate workload,
reduce control, and contribute to community breakdown. The conditioning effects
of training and values were also explored. Managers, an understudied group,
reported the highest levels of stress and strain. Limitations of the study and
suggestions for further research are discussed.

Acknowledgements

To the memory of my father, Mier Zalcman, who passed away during the final stages of this project.

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Chapter One: Introduction

Every now and then go away, have a little relaxation, since to remain constantly at work will cause you to lose power of judgment.
    - Leonardo da Vinci

... technology is indeed a queen: it does change the world.
    - Fernand Braudel

In a recent television commercial, a solitary human figure stands on a sun-drenched mountaintop gazing rapturously across an uninhabited vista. Wisps of cloud float in a cerulean breeze as the camera slowly pulls back to reveal a panoramic paradise. Suddenly a cell phone rings, shattering the silence and serenity of the moment. The basic message: you can always count on our products and technology; the subliminal message: no matter where you are, you can always reach out and be reached. While these notions of reliability and connectedness must have resonated with focus groups, other viewers could be forgiven for perceiving a more chilling subtext: there's no escape from the yoke of the 24/7 phenomenon. Whereas information and communication technology (ICT) may offer resources which enhance our lives in various ways, it may also create new demands which generate negative outcomes such as increased job stress and burnout.

The unprecedented proliferation of ICT has clearly influenced if not transformed the ways in which we perceive, understand, manage, and perform our work. It has influenced, and, at times, altered the ways in which we communicate and relate to others. And, in some settings and contexts, it has

challenged workplace norms, values, climate, and culture. As ICTs increasingly penetrate every sector of the economy, type of firm, and occupational category (Bakker, 2000; Statistics Canada, 2001a, 2001b), research opportunities and challenges for organizational scientists abound (Cascio, 1995; Frese & Zapf, 1988; Methot & Philips-Grant, 1998; Sauter & Hurrell, 1987; Sparks, Faragher, & Cooper, 2001; Symon, 2000).

Although much has been written about technology, a review of the literature reveals a number of gaps. First of all, there is a preponderance of research at the organizational and group levels. Much less attention has been paid to the impact of technology on individual workers despite the widespread view that ICT exacerbates job stress. Second of all, many studies have focused on production technologies in large manufacturing firms, as well as on issues germane to the information technology (IT) sector itself (McNish, 2002). Conversely, few studies have examined the impact of office technologies in a variety of job contexts in different settings. Finally, the limited research on individuals has zeroed in on the impact of ICT on clerical and technical workers; few studies have explored the effect of technologies on other occupational groups.

As a result, we now have voluminous literatures in the area of structuration and structural changes (e.g., Boddy & Gunson, 1996; Heckscher & Donnellon, 1994; Nohria & Eccles, 1992; Zuboff, 1988), and in the area of network communications and team work (e.g., Fulk & deSanctis, 1995; Markus, 1994; Orlikowski, 2000; Sproull & Kiesler, 1991). Studies on ergonomics (e.g.,

Damodaran, 2001; Eason, 1984; Shackel, 1997) and electronic performance monitoring (EPM) (e.g., Aiello & Kolb, 1995; Smith, Carayon, & Miezio, 1987) have tended to predominate at the individual level of analysis.

While these streams of research have advanced our abilities to understand and address technical matters related to the adoption of new technologies, as well as to appreciate a broader range of issues specific to the technology sector, our attention to human concerns and human resource issues has been less rigorous, consistent, and comprehensive. Hence our understanding of the impact of new technologies on end users in diverse sectors, settings, and occupational groups is somewhat constrained.

As a result of these gaps in our knowledge, some of the revolutionary properties ascribed to technology, both in the popular press and in the academic literature, frequently take the form of intuitively appealing assumptions that have not been empirically tested, particularly as they pertain to ICT and occupational stress. For example, increased cognitive demands, time pressures, anxiety, somatic complaints, and work-life conflict are often attributed to the introduction of ICT into the workplace (e.g., Cartwright & Cooper, 1997; Duxbury & Higgins, 2002; International Labour Office, 2000; Levi, 1998; World Health Organization, 2001), but these observations are rarely informed by data.

As will be demonstrated, a review of the extant literature suggests that a number of salient variables in the ICT-stress relationship may converge in three areas of worklife: workload, control, and community. Furthermore, values seem to influence the ways in which workload, control, and community may mediate

the ICT-stress relationship. In addition, training may offer salutary benefits as workers struggle to keep up with ongoing cognitive demands and continuous change.

This study investigates the impact of ICT on job stress among Canadian managers, professionals, and clerical and administrative workers in the not-for-profit (NFP) sector. A conceptual model, based on the literature, was developed and tested in order to examine some of the less studied but salient aspects of ICT impact. In sum, whereas ICT has rapidly penetrated the Canadian workplace and is now firmly entrenched in our daily lives, existing research reveals limitations in four areas of study: level of analysis, firm size and sector, technology type, and occupational group. These limitations are manifest in the following ways:

- Most studies have examined organizations and groups. There has been surprisingly little conceptual and empirical research on human and human resource issues despite widespread suggestions that, on the one hand, ICT contributes to increased stress, burnout, and even depression (International Labour Organization, 2000; Leckie, Leonard, Turcotte, & Wallace, 2001; Paoli, 1997) while, on the other hand, it empowers workers in transformed workplaces (e.g., Sproull & Kiesler, 1991);

- Most studies have been rooted in large firms as well as in the IT sector itself despite the near universal adoption of ICT in a variety of firms, sectors, and settings (Statistics Canada, 2001b);

- Most studies have focused on production technologies. Much less research has examined office technologies; and

- Finally, most studies have concentrated on production and clerical workers. Hence we know less about the impact of ICT on other occupational groups.

This study aims at contributing to our understanding of the impact of technology in the workplace by examining the identified understudied phenomena in order to elucidate some of the shaded corners of our knowledge. Hence:

- Research was conducted at the individual level as opposed to the group or organizational level;

- The not-for-profit (NFP) sector, a less studied sector where stress is very salient, and where ICT is very widely diffused (Bakker, 2000; Statistics Canada 2001b), was selected as the research site for this study. Approximately half of all Canadian workers in this sector report mental health problems, vastly exceeding incidences in either the private or public sectors (Duxbury & Higgins, 2002);

- Office technologies rather than production technologies were targeted; and

- Various occupational groups, specifically managers, professionals, and clerical workers, were included, as opposed to only technical and clerical workers.

The conceptual framework developed and tested in this study adapts and integrates constructs from the job-control model of occupational stress (Karasek, 1979) and the job-person fit model of burnout (Maslach & Leiter, 1997). Following more than 25 years of conceptual and empirical research, Maslach and her colleagues (Maslach, Schaufeli, & Leiter, 2001) hypothesized that occupational stress and burnout could best be understood in terms of the degree of match or mismatch between people and their job environments in six areas of worklife. The framework introduced in this study advances the proposition that three of those areas, workload, control, and community, mediate the link between ICT, stress, and burnout. If ICT introduces demands that exceed available resources in the areas of workload, control, and community, stress will likely occur. This is the central thesis of the study described in this report.

The overall goal of the present research is to explore how and why ICT contributes to job stress and burnout in a variety of occupational groups, contexts, and settings. This, in turn, will allow us to identify strategies to attenuate the potential stress and strain associated with ICT use, and to tap and maximize the potential benefits of ICT.

This remainder of this research report has been organized into four sections. Chapter Two begins with a review of the literature on the integration of ICT into the workplace. The advantages and disadvantages of new technologies and their impact on job stress are also examined. Data on Canadian workers and characteristics of the NFP sector are presented as well. This section concludes by summarizing the research model developed from the literature and introducing the questions which guided the data collection. Chapter Three describes the methodology used to test the model. The model was tested in a multiple case study of six NFP organizations, with qualitative data triangulated in 18 interviews, on-site observations, and documentation analysis. Chapter Four presents and analyzes the results of the data collection in two parts. A detailed description of each case set is followed by a cross-case analysis in which responses have been aggregated in order to identify general trends. Chapter Five sets out a series of research and practical recommendations. New findings and issues emerging from the study are summarized, and a revised model is subsequently presented. Testable propositions are developed for further study and limitations of the research are described. Finally, some concluding thoughts are offered.

Chapter Two: Literature Review and Model

The real voyage of discovery consists not in seeking new landscapes, but in having new eyes.
- Marcel Proust

Man's yesterday may n'er be like his morrow;
Nought may endure but Mutability.
- Percy Bysshe Shelley

Thirty years ago, cyberspace was a dimension of science fiction. We might have conjectured that hypertext was an abnormal writing disorder, and 'url' could have been a child's abbreviation for anatomical matters not frequently discussed in polite company. Google, at best, was a misspelled mathematical exponent, or perhaps an adjective for rolling, protuberant eyes, while cells remained a biological unit of analysis or one of those places where criminals are kept.

In 1986, cyberspace and hypertext entered the Merriam-Webster universe. Url is now a distinct place in time, and 'google' risks becoming a verb. Cells are no longer the exclusive domain of biology or prisons, but you can get a ticket for using one while driving in some jurisdictions. Much of the burgeoning technology lexicon has already become commonplace as it is increasingly absorbed into our daily lives and discourse.

Today, in a typical work day, over 80 per cent of Canadian managers, professionals, and clerical workers (Statistics Canada, 2001b) boot their computers, check their email, surf the Internet, and download information. More

than 50 per cent communicate by cellular phones (Sciadas, 2002), and voice messaging systems seem to follow us everywhere.

Thirty years ago, we did not even have a vocabulary to describe some of the work activities, technologies, and tools that characterize the contemporary workplace. Even as we struggle to grasp the impact of what we now routinely use, a new generation of wireless communications is upon us. As voice and data communications, networks, and wireless technologies converge, we will be navigating an increasingly virtual and omnipresent world of work with an ever-expanding inventory of electronic tools such as personal digital assistants (PDAs), pocket PCs, and the eponymous Blackberry devices. The extent to which these technologies will drive, transform, or simply facilitate new ways of work remains unknown. However, it is abundantly clear that with the adoption, diffusion, and rooting of ICT, workers of all types have experienced a good deal of change, both episodic and continuous (Weick & Quinn, 1999). While episodic change, the infrequent, dramatic type of change associated with upheaval, tends to characterize the initial adoption of ICT, continuous change, the incremental variety associated with newly emerging organizational forms, seems to increasingly define the modern workplace.

The technological changes we have witnessed and experienced over the last 30 years have had both positive and negative consequences in the workplace. On the one hand, new technologies can offer unique resources with tremendous potential to transform organizations (Zuboff, 1988). For example, ICT has stimulated productivity gains (Baldwin & Sabourin, 2001), generated cost

savings (Betcherman & McMullen, 1998), increased operational efficiencies (Boddy & Gunson, 1996), and facilitated innovation (Baldwin, 1999). At the individual level, employees have reported that their work has become more interesting (Attewell & Rule, 1984), more challenging (Betcherman & McMullen, 1998), and more satisfying (Lin & Popovic, 2002) as a result of technology. These reactions have been particularly salient when jobs are upgraded and workers are relieved of some routine, repetitive tasks (Methot & Phillips-Grant, 1998). On the other hand, technology can also introduce new demands which may exacerbate workload (Cooper, 1998), contribute to work-life conflict (Duxbury & Higgins, 2002), create new cognitive demands (Ganster, Hurrell, & Thomas, 1987), reduce perceived control (Frese, 1987), increase time pressures (Zapf, 1995), and promote isolation (Kraut, Lundmark, Patterson, Kiesler, Mukopadhyay, & Scherlis, 1998). These consequences, in turn, may exacerbate job stress (Cartwright & Cooper, 1997; Karasek & Theorell, 1990; Sauter & Hurrell, 1987), trigger fatigue or exhaustion (Burke, 1988), and promote feelings of inefficacy (Bandura, 2001; Maslach, 1998).

At the same time, work-related occupational stress, burnout, and depression have been increasing throughout the world. In a major, in-depth study of mental health problems in the workplace, the International Labour Organization (ILO) found that approximately 10 per cent of all workers in Finland, Germany, Poland, the UK, and the US, have experienced work-related depression, anxiety, stress, or burnout which, in turn, have led to increased withdrawal behaviours such as absenteeism, hospitalization, decreased

productivity, and turnover (ILO, 2000). The World Health Organization (WHO, 2001) furthermore predicts that job-related stress and depression will become the second largest cause of death and disability by the year 2020, affecting up to 15 per cent of all workers.

The social and economic costs of mental health problems are staggering. For example, in the US, the national cost for treating depression is estimated at $44 billion annually (Kline & Sussman, 2000) while the overall cost of work stress and stress-related problems is approximately $150 billion (Cartwright & Cooper, 1997). According to the WHO (2001), costs associated with treating mental health problems in the UK account for 22 per cent of all health care spending.

Technology is frequently cited as contributing to increases in occupational stress and work-related depression. For example, a Google search on technology and work-related stress will yield from approximately 200,000 to over half a million references culled from the popular press and practitioner literature, depending on how search terms are worded. However, these citations are rarely supported by data.

In a 1988 review of the literature on computer work and stress, Briner and Hockey lamented the lack of empirical support for the widespread notion that technology has contributed to increases in job stress. Ten years later, in a review of technological advances in Canada, Methot and Phillips-Grant (1998) made the same observation, as have other researchers around the world (e.g., Kalimo, 1999; Sauter & Murphy, 1995; Sparks et al., 2001). As technologies increasingly pervade the workplace, affecting workers at all levels in diverse occupational

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groups, our need to understand the psychological impact of ICT as well as its effect on stress and other health outcomes becomes increasingly compelling (Lin & Popovic , 2002; Sauter and Hurrell, 1987).

2.1 Definition of ICT

The term ICT encompasses a range of technologies, techniques, and equipment. This study focuses primarily on the use and impact of the following: cellular telephones, computers, electronic mail, Internet, and voice messaging systems. The technologies selected for study in this paper were identified through Statistics Canada (2001a) and the Office of Economic Cooperation and Development (OECD) classifications (Bakker, 2000) and were drawn from among the most widely diffused, commonly employed, and fastest growing media. Although references to other technologies, such as intranets, groupware, videoconferencing, and others, may be made, they are not the primary focus of this research.

In addition, the technologies investigated here are being examined in their role as general purpose, office technologies used by workers at different levels in a variety of settings, in the course of performing diverse jobs. The study does not examine the role of ICT as an enabling technology in a specific application, such as manufacturing. Whereas insights may be gleaned from production work and other contexts in order to elucidate the research questions addressed here, those environments are not the focus of this study. Finally, the terms 'ICT' and 'technology' will be used interchangeably throughout this paper.

2.2 ICT Use in Canada

According to Statistics Canada, computer use in the Canadian workplace more than doubled in the last decade (Wannell & Ali, 2002). In the early 1980s, 16 per cent of Canadian workers were using computers at work on a regular basis (Betcherman & McMullen, 1998). By the mid-nineties, the figure had climbed to 50 per cent (Betcherman, McMullen, & Davidman, 1998), with two out of three Canadian workers possessing computer skills (Lowe, 2000). By the year 2000, approximately 65 per cent of all Canadian workers were using computers (Statistics Canada, 2001b). In some settings and occupational groups, use was reported to be as high as 90 per cent. This included sectors such as government offices and agencies, the public service, and educational establishments, as well as occupational groups such as managers in all sectors (Bakker, 2000). Statistics Canada has reported similar levels of email and Internet usage. In the private sector, more than half of all firms use email and Internet services; in the public and NFP sectors, over 95 per cent use email and Internet (Bakker, 2000). Employee access to these technologies ranges from approximately one in three workers in the private sector to between 60 and 100 per cent in the public and NFP sectors (Bakker, 2000). Voice messaging has become the norm in most offices, with up to 100 per cent of all employees in the public and NFP sectors having access; in addition, more than half use cell phones (Sciadas, 2002).

Research in Canada suggests that ICT is both driving and facilitating organizational change, particularly in the areas of organizational structure, staff

deployment, and productivity (Betcherman & McMullen, 1998). In the last decade, approximately 90 per cent of Canadian firms re-engineered, some continuously, while downsizing began to drop steadily (Statistics Canada, 2001a). Studies on technology and productivity have indicated that ICT adoption in the last two decades led to greater gains in productivity and market share. In fact, the output of firms using ICT exceeded that of non-users by approximately 20 per cent (Baldwin, Diverty, & Sabourin, 1995; Baldwin & Sabourin, 2001), despite a general decline in productivity in Canada during the same period (Betcherman & McMullen, 1998).

At the same time, the successful adoption of new technologies would appear to be contingent on the development and implementation of related human resource strategies as companies that have adopted both technological and human resource innovations have achieved greater performance gains than firms that have not addressed human resource challenges (Baldwin, 1999; Betcherman & McMullen, 1998). Nonetheless, human resource issues in ICT have received much less attention than matters pertaining to organization structure and design (Baldwin, 1999).

In Canada, ICT adoption has resulted in both deskilling and upgrading, depending on the type of technology adopted and its purpose (Betcherman & McMullen, 1998). Some jobs have been eliminated as well. For example, telecommunications technology has enabled many receptionist functions to be replaced with automated systems, and many clerical jobs have been phased out or restructured with concomitant retraining and/or reassignment of clerical staff

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(Methot & Phillips-Grant, 1998). While we do not know exactly how and to what extent everyday worklife in Canada is affected by ICT, it is clear that ICT has altered our daily routines and will likely continue to do so. This includes the ways in which we function, feel, and interact at work. As these changes become increasingly manifest, the demands associated with work also change.

2.2.1 The Not-For-Profit Sector. This study was conducted in the NFP sector. The private, public, and NFP designations used in the present research are based on Statistics Canada (2001b) and Health Canada (Duxbury & Higgins, 2002) typologies, which, in turn, are derived from the North American Industry Classification System (NAICS) codes and definitions. Organizations in the NFP sector include those delivering educational services, health care services, residential care, and social services. Also included are civics, professional, philanthropic, and religious institutions, as well as non-governmental organizations (NGOs) with a public service mandates.

In a recent study of worklife balance among Canadian employees with 31,476 respondents in the private, public, and NFP sectors (Duxbury & Higgins, 2002), employees in the NFP sector reported the highest levels of mental health problems. More than half reported symptoms of stress, and one in three reported burnout and depressed mood. Employees in the NFP sector spend more time at work than employees in the public and private sectors, and they also report the highest levels of unpaid overtime. ICT is very widely diffused in NFPs, with more than 90 per cent using new technologies (Bakker, 2000).

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2.3 ICT and Job Stress

A convergence of circumstances, including the exponential growth and capabilities of ICTs, globalization, and downsizing, appear to have exacerbated job stress, introducing new job demands which may be contributing to work overload, increased cognitive demands, reduced decision latitude (Karasek, 1979; Karasek & Theorell, 1990; Sauter & Hurrell, 1987), and, in some cases, job burnout, particularly feelings of exhaustion and inefficacy (Bandura, 2001; Maslach & Leiter, 1997; Maslach et. al., 2001).

2.3.1 Theories of Occupational Stress. Job stress research has been largely guided by four theoretical streams: social role theory (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964); person-environment (P-E) fit (French, Caplan, & Harrison, 1982); cognitive appraisal theory (Lazarus & Folkman, 1984), and the job demand-control model (Karasek, 1979). In their review of stress research in Canada throughout the nineties, Baba, Jamal, and Tourigny (1998) observed that the theoretical and empirical literatures had begun to cohere around the concepts of imbalance and fit.

Definitions of stress and strain vary considerably (Jex, Beehr, & Roberts, 1992). Many current conceptualizations of occupational stress appear to stem from McGrath's (1970) description of stress as a response to a change, in our task environment, that generates new demands outside of our behavioural inventory. Consistent with this perspective, and in keeping with P-E fit theory, Beehr (1998) defined stressors as events or conditions in the work environment that create stress, and he defined strains as individual reactions to stressors

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perceived as detrimental to mental and/or physical health. In this context, stress is conceptualized as a situation in which stressors and strains exist.

Lazarus and his colleagues (Folkman, Lazarus, Gruen, & DeLongis, 1986, p. 572) defined stress as "a relationship between the person and environment that is appraised by the person as taxing or exceeding his or her resources and endangering well-being." They furthermore suggested that cognitive appraisal and coping mediate person-environment relationships. P-E theory advances the proposition that well-being is diminished when there is a misfit between individual and job characteristics; stress is consequently interpreted as a poor fit between the person and the job environment or context (Edwards, Caplan, & Harrison, 1998). Both P-E fit and cognitive appraisal theories conceptualize stress as an outcome of the interaction between environmental or situational factors, and individual characteristics and perception. The relationship between individual and contextual factors would appear to be very relevant to the study of ICT and stress as ICT impact is at least partially determined by its organizational context although it is experienced at an individual level.

In their ground-breaking volume on occupational stress, Ivancevich and Matteson (1980) posited that stressors could be either endogenous or environmental, and they identified five principal sources of job stress: role conflict, role ambiguity, work overload, responsibility for people, and career development issues, including skill degradation or obsolescence. They furthermore suggested that organizational factors, including climate, structure, and task characteristics, could influence stress outcomes. These sources would

appear to be very relevant to the study of ICT as they tap issues that are becoming increasingly salient in the study of ICT.

Role stress, particularly role conflict and role ambiguity, is one most widely studied set of stressors (Baba et al., 1998; Beehr 1995; Van der Velde & Class, 1995). ICT adoption may exacerbate role stress by introducing new demands and expectations that impose additional pressures at work. Competing demands may, in turn, lead to role conflict. Furthermore, shifting task objectives or responsibilities may create ambiguity. Information overload and multitasking, both associated with ICT (Paoli, 1997), may exacerbate stress by contributing to work overload. French and his colleagues (French et al., 1982) also suggested that too much or too little responsibility for others can be a source of stress. As ICT can both increase and decrease the responsibilities of managers and professionals, members of these occupational groups may be experiencing more stress. Karasek and Theorell (1990) postulated that the interaction of increased job demands such as overload of work, or skill loss, and reduced control, can result in strain.

Much job stress research has converged around the job demand-control model (Karasek, 1979), a two-dimensional framework, with multidimensional constructs. The Karasek model conceptualizes job strain as a consequence of the interaction between job demands and decision latitude. Strain is said to occur when decision latitude and other resources do not exist in proportion to psychological and other job demands. Like many good theories, the Karasek model is parsimonious and has intuitive appeal. It addresses both behavioural

and health outcomes, and has garnered much empirical support (Landsbergis, Schnall, Schwartz, Warren, & Pickering, 1995) despite the suggestion that it may confound control and complexity (Zapf, 1995).

In this paper, the terms stressor, stress, and strain, will be used in keeping with Beehr's (1998) definitions. Following the Karasek model, this study advances the proposition that ICT may contribute to job stress by creating an imbalance between new demands and the resources available to meet those demands, resulting in strain.

2.3.2 Impact of ICT on Job Stress. As noted in the previous section, new environmental demands in the workplace may generate negative psychological, behavioural, and health outcomes (Beehr, 1995; Folkman et al., 1986; French et al., 1982; Karasek & Theorell, 1990; Landsbergis et al., 1995; McGrath, 1970). The adoption, rapid diffusion, and evolution of ICT have introduced a number of new demands into the workplace, which, in turn, appear to have exacerbated job stress.

In a review of the literature on computer work and job stress, Briner and Hockey (1988) identified four major sources of stress: human factors constraints, organizational designs, work demands, and personal characteristics. Concluding that new work demands appeared to be the most promising avenue for further study, they identified the following technology-related demands:

- changes in skill requirements;
- decreased variety and increased monotony;
- new cognitive demands;

- attentional demands, including multitasking requirements;

- frustration stemming from equipment breakdowns;

- rapid response times as well as the need to work quickly; and

- reduced social contact and support.

Briner and Hockey also suggested that technology may introduce new demands into office work environments in general. Research in Canada has also shown that in its role as a general purpose technology, ICT has been increasingly affecting a wide range of occupations, not only clerical and technical work (Betcherman & McMullen, 1998).

There is much empirical support for the notion that changes in skill requirements related to the introduction of ICT have contributed to increased strain (e.g., Attewell & Rule, 1984; Cooper & Smith, 1984; Earl, 1996; Turner & Karasek, 1984; Zapf, 1995). Deskilling, in particular, has also been associated with negative outcomes. Increased repetitive or monotonous work, with its concomitant reduction in decision latitude and control, has also been shown to contribute to worker strain (Buchanan & Boddy, 1983; Turner, 1984; Zapf, 1995). As skill variety tends to be an important characteristic of jobs that are inherently motivating and perceived as meaningful (Hackman & Oldham, 1976, 1980), deskilling may be associated with increased dissatisfaction. While most workers report that upskilling has made their work more interesting (Lin & Popovic, 2002), upskilling can also have negative consequences. For example, many workers have reported that the challenges inherent in upgraded jobs can become overwhelming (Statistics Canada, 2001a).

The need to adapt to new technologies may also impose ongoing cognitive demands that create strain (Bandura, 2001; Bikson, 1987; Sauter & Hurrell, 1987). In an attempt to develop an instrument to measure cognitive demands related to computer work, Ganster and his colleagues (Ganster et al., 1987) found some evidence that information load and characteristics, memory load and requirements, and uncertainty predicted perceived stress, exhaustion, and somatic complaints. Although early research on cognitive demands was linked to the initial challenges of mastering complex commands and systems (Briner & Hockey, 1988), the rapid pace of change suggests that intellectual challenges and the need to adapt may be ongoing (Boddy & Gunson, 1996); hence, cognitive demands will likely remain relevant, even as technologies become more user-friendly. In a longitudinal case study of six large organizations in the UK, Boddy and Gunson (1996) found that change occurred so rapidly that important research questions had to be modified in the course of their investigation.

Although the frequency of equipment breakdowns may decline as technologies improve, hardware problems have been associated with increased frustration and anxiety (Burke, 1990; Caplan & Jones, 1975; Johansson & Aronsson, 1984; Karasek & Theorell, 1990). In a recent study, Zohar (1999) found that a variety of daily occupational hassles (Kanner, Coyne, Schaefer, & Lazarus, 1981) may contribute to negative mood, fatigue, and perceptions of qualitative workload, in spite of the transitory nature of hassles. The impact of occupational hassles was furthermore found to be particularly salient when task

complexity was high, and when the work had to be completed in an expeditious manner as is often the case in work supported by ICT, particularly at the professional and managerial levels.

A few empirical studies have also found a relationship between increased time pressures, such as rapid response, and psychological strain (Bradley, 1983; Liff, 1990; Zapf, 1995). Rapid response requirements may additionally increase the potential for error, creating feelings of anxiety (Brodbeck, Zapf, & Frese, 1993). Although most of these studies focused predominantly or exclusively on female clerical workers, strain outcomes associated with time pressures may become more salient as technology is increasingly embedded in a variety of jobs. If expectations of rapid response and turnaround time persist and prevail in the workplace, they may add a continuously stressful dimension to the work environment. Empirical research has consistently shown that chronic stress has a stronger impact on strain than does acute stress (Beehr, 1998).

There is some evidence that ICT may promote isolation, depersonalized communication, and decreased interaction in the workplace (Cartwright & Cooper, 1997). Reduced social contact related to technology use has been linked to stress and even depressed mood (Kraut et al., 1998). The relationship between social support and stress has been extensively studied, but with mixed results (Baba et al., 1998; Jones, Flynn, & Kelloway, 1995). Although the extent to which it has a buffering effect is not clear (Beehr, 1998; Pearlin & Schooler, 1978), social support had a direct impact on reducing stress in some studies (e.g., Baba, Galperin, & Lituchy, 1999; House, 1981).

2.3.3 Impact of ICT on Different Occupational Groups. Job context, which has been shown to influence stress and burnout in a number of studies (Cordes & Dougherty, 1993), will likely become increasingly important in the study of ICT impact on stress as technology becomes more widely diffused among different occupational groups. Research on technology and stress has focused primarily on clerical or technical workers (Betcherman & McMullen, 1998; Briner & Hockey, 1988), with less attention paid to other occupational groups. For example, references to managers and executives have been formulated largely in terms of their decision-making roles in technology adoption and use; most studies have not considered executives as users of technology.

Impact of ICT on Managers. Although it has been customary to view managers in their roles as advocates of technological change (Zuboff, 1988), managers are also the biggest users of ICT in the Canadian workplace today, with over 90 per cent in all sectors employing ICT on a regular basis (Bakker, 2000). Consequently, managers, like other employees, may be experiencing strain related to technology impact. In addition, some aspects of ICT-related managerial stress may be idiosyncratic. For example, managers tend to prefer face-to-face (FTF) communication to reduce uncertainty and ambiguity (Daft & Lengel, 1986) as well as to build collegial relationships and networks (Mintzberg, 1999). Consequently, the growing use of computer-mediated communication, with its reduced social cues, may impose new, incompatible ways of working, which, in turn, may contribute to strain.

The characteristics of managerial work have been studied extensively. In a review of the literature, including his own case studies, Mintzberg (1999, p.23) stated that managerial work is characterized by "brevity, variety, and discontinuity." Quickly paced, with frequent interruptions, most activities last no longer than nine minutes. Mintzberg (1999) has also observed that managers tend to favour verbal media to obtain current, up-to-date information; in particular, they prefer telephone calls and meetings to written communications. As technology can facilitate information overload (Symon, 2000), it may also contribute to managerial strain by replacing parsimonious documentation with an unwieldy volume of written material. This can also impose additional time pressures.

Another potentially important source of strain for managers is an increase in the frequency of interruptions at work. Frequent interruption is already endemic in managerial work (Mintzberg, 1999). Not only can ICT multiply incidences of interruption, it may permit greater access to managers (Sproull & Kiesler, 1991); hence, the number of interruptions and intrusions managers experience may become overwhelming. Work interference can also carry over into home life, exacerbating work-life conflict (Leiter & Durup, 1996). As work-life conflict is already salient among managers (Burke, 1988; Duxbury & Higgins, 2002), technology may further erode the boundaries between work and home.

Empirical research suggests that the pressure to keep up with changes can also be a source of stress for managers and executives (Cooper, 1984). The continuous change and need to adapt that characterize ICT may exacerbate this

pressure. In smaller organizations, chief executives must also perform some routine administrative work as they have more limited resources, including smaller staff complements. While executives are not likely to lose support staff, middle managers and supervisors may be expected to use technology and software to replace some support staff functions; thus, the quantitative workloads of middle managers and supervisors may be increasing. Finally, the challenges of managing technology implementation and addressing related staff issues may also exacerbate managerial stress.

Impact on Professionals. In an early review of the literature on computer work and health problems, Sauter and Hurrell (1987) predicted that professionals will be increasingly affected by the diffusion of office technologies. These effects may be related to both the direct impact of ICT on professional work and the indirect effects stemming from changes in organizational design and structure. For example, over 80 per cent of professionals in all sectors have access to computers, email, Internet, and voice messaging systems (Statistics Canada, 2001b). Consequently, they may be increasingly expected to take care of their own word processing, filing, communications, and research needs. Losing clerical support may therefore exacerbate their workloads. Adding a clerical component to professional work may also contribute to some deskilling of professionals. Other sources of professional stress include role stressors, relationships with others, career development, and work-family conflict (Burke, 1988). As shown in the previous section, ICT may exacerbate these issues, and, consequently, add to strain.

Impact on Clerical and Administrative Workers. Much of the research on ICT adoption has focused on clerical-administrative workers and examined stress and strains associated with the following issues: video-display terminal (VDT) use (Damodaran, 2001); equipment problems (e.g., Caplan & Jones, 1975; Johansson & Aronsson, 1984); electronic performance monitoring (e.g., Aiello & Kolb, 1995; Smith et al., 1987); and skilling (e.g., Attewell & Rule, 1984; Wall, Clegg, Davies, Kemp, & Mueller, 1987). In an early review of the literature on computer work and health problems, Sauter and Hurrell (1987) predicted that clerical workers may ultimately benefit from ICT via improved resources leading to increased job satisfaction. Current research tends to support this view (Methot & Phillips-Grant, 1998). Although initial adaptation to new technologies may challenge efficacy beliefs (Bandura, 2001), contributing to feelings of anxiety, the acute stress associated with technology adoption tends to dissipate as workers acclimatize and adjust to change (Bikson, 1987). Once the initial adjustments have been made, clerical workers may find themselves in upgraded jobs, with more variety and challenges. Other sources of strain for clerical-administrative workers include job insecurity (Methot & Phillips-Grant, 1998) and ongoing cognitive demands (Leckie et al., 2001).

2.4 Bringing It All Together: Key Considerations and a Model

Based on the foregoing literature, it would appear that many salient factors in the ICT-job stress relationship can be integrated into five key constructs: workload, control, community, values, and training. This study advances the

propositions that: workload, control, and community mediate the ICT-stress relationship; and values and training moderate the relationships between and among ICT and workload, control, and community (see Figure 2.1).

The model developed and tested in this study adapts concepts from a framework introduced by Maslach and Leiter (1997) to study burnout, and it extends these concepts to the study of the ICT-stress relationship. Maslach and her colleagues (Maslach et al., 2001) proposed that job burnout results from a mismatch between the person and the job in six areas of worklife: workload, control, reward, community, fairness, and values. The Maslach and Leiter framework integrates concepts from P-E fit (French et al., 1982) and interactionist (Lazarus, 1993) theories of occupational stress in that it recognizes the centrality of both individual and contextual factors. ICT-related stress, like burnout, emerges as a consequence of organizational factors, although it is experienced individually.

2.4.1 Workload. Work overload can be either quantitative, as in having too much to do, or qualitative, as in lacking the necessary skills to do a job, or in setting unrealistic performance standards (Ivancevich & Matteson, 1980; Maslach et al., 2001). Average office workers in the US, the UK, or Canada today receive approximately 200 emails daily, and spend 60 per cent of their time processing information, regardless of their primary occupations (Denning, 2002; McCune, 1998). If one takes only 20 seconds to assess whether to delete, answer, or store a message, it will take one hour to simply triage one's email. Technology may also contribute to work overload by blurring the boundaries

between work and home life (Duxbury & Higgins, 2002), thereby facilitating "24/7" connectedness to the job. In addition, ICT may generate expectations that employees can be more productive or can take on extra responsibilities. Changing expectations, in turn, may violate psychological contracts between employers and employees (Robinson, Kraatz, & Rousseau, 1994), and exacerbate stress.

While upgrading of jobs has generally been perceived as a positive consequence of ICT (Attewell & Rule, 1982; Betcherman & McMullen, 1998), it may also have a negative dimension. In their review of the literature on technological change in Canada, Methot and Phillips-Grant (1998) noted that most workers reported that their jobs had become more interesting as a result of technology. Omnibus studies by Human Resources Development Canada (Lin & Popovic, 2002) and Statistics Canada (Leckie et al., 2001), generally affirmed this conclusion. However, these studies also found that workers felt that their workloads had increased as a consequence of ICT-related changes, and that the impact was overwhelming at times. Although the motivating potential of enriched work (Hackman & Oldham, 1980) has yielded robust results (Ferris & Fried, 1987), more recent studies have presented some compelling, counterintuitive findings. For example, Xie and Johns (1995) found a curvilinear relationship between job scope and stress, suggesting that both insufficient and excessive scope can generate stress.

2.4.2 Control. In the Maslach and Leiter framework (Maslach & Leiter, 1997; Maslach et al., 2001), mismatches in control are conceptualized as having

little control over one's work as a result of inadequate resources, insufficient authority, or turbulent conditions in the job environment. In a meticulous study of the interaction between real and perceived demands and perceived control, Fox, Dwyer, and Ganster (1993) found that perceived control had a greater impact on health and well-being than actual control. Many of the new demands related to the introduction of ICT into the workplace appear to be associated with concomitant reductions in control.

Bandura (2001) has suggested that ICT has a paradoxical effect; although technology's potential to enhance human agency is "revolutionary," technology can also introduce constraints, controlling thought processes and behaviour. For example, control is clearly compromised when technologies dictate the ways in which work must be carried out, as has been observed in a number of longitudinal case studies (e.g., Boddy & Gunson, 1996; Zuboff, 1988). Equipment problems may also promote feelings of anxiety and a loss of control (Briner & Hockey, 1988).

As noted in the previous section on ICT and job stress, ICT may also exacerbate interruptions at work, and introduce expectations of immediate feedback and rapid turnaround time; hence perceptions of control related to decision latitude may be lowered as well. Frese (1987) has suggested that control be treated as a central variable in the impact of computers in the workplace. In a time series of studies on blue-collar workers in the manufacturing sector, the introduction of computers had little or no impact on the amount of control workers had; however, perceived control of technology was associated

with positive outcomes such as job satisfaction and well-being. Also training programs that were participative or employee-focused resulted in better transfer and performance levels than programs which were more structured. Frese therefore concluded that control had an impact on both stress and performance, and that it should be treated as a key variable in the study of computer use. Although sample sizes were small, Frese's observations parallel findings in other areas of stress research, such as Jackson's landmark study on participation and strain (Jackson, 1983).

Routineness may be salient here as well. In a series of studies on shiftwork and other types of non-routine work, Jamal and his colleagues (Baba & Jamal, 1991; Jamal, 1981; Jamal, 1989; Jamal & Baba, 1982; Jamal & Jamal, 1982) found that more routine, stable work contexts, such as fixed shifts and routine schedules, were associated with more positive quality-of-worklife outcomes such as job satisfaction and organizational commitment. In addition, Jamal and his associates found lower incidences of withdrawal behaviours. The frequent interruptions, constant access, and 24/7 availability associated with ICTs may disrupt the safety net of reliability and comfort brought about by routineness, thus reducing perceived control and exacerbating stress. Non-routineness may furthermore be compounded in sectors such as the NFP where individuals already work long hours, evenings, and weekends (Duxbury & Higgins, 2002). NFPs engaged in delivering health, social, and cultural services may use shiftwork as well.

2.4.3 Community. Maslach and colleagues (Maslach & Leiter, 1997; Maslach, Schaufeli, & Leiter, 2001) suggested that a breakdown in community occurs when individuals lose their sense of positive affiliation with others. Technology has been characterized as contributing to feelings of increased isolation and depersonalization (Kraut et al, 1998), as well as to a sense of increased participation and connectedness (Hinds & Kiesler, 1995). Although early research suggested that ICT enhanced participation, democracy, and connectedness (e.g., Sproull & Kiesler, 1991), there is a growing consensus in the literature that these conditions tend to be driven by organizational context and culture rather than by the presence of technology (Mantovani, 1994; Markus, 1994; McKenney, Zack, & Dougherty, 1992; Orlikowski, 1992). There is also some evidence that the reduction of social cues in media such as email can also generate negative outcomes, such as disinhibition, flaming, deception, and dishonesty (Nohria & Eccles, 1992; Sproull & Kiesler, 1991). These, in turn, may promote tension and conflict. In addition, the growing use of media low in richness (Daft & Lengel, 1986) to address issues traditionally associated with FTF communications may exacerbate uncertainty and equivocality, leading to increased strain.

2.4.4 Values. Maslach and colleagues (Maslach & Leiter, 1997; Maslach, Schaufeli, & Leiter, 2001) suggested that a mismatch between organizational and individual values could disrupt relationships in the workplace. They furthermore noted that this could be particularly salient during periods of change, leading to increased strain and burnout.

In her longitudinal case studies of five organizations in the early stages of ICT adoption, Zuboff (1988, p. 389) noted that technology seemed to have two important dimensions: the "intrinsic and the contingent." In other words, the extent to which technology drives change depends on the interplay between contextual forces, such as social and economic conditions and needs, and the nature of the technology and its transformational capability. In testing her structurational model of technology, Orlikowski (1992, pp. 621-622) found that culture will "significantly influence what technologies are deployed, how they are understood, and in which ways they are used."

As Kotter (1998) observed, change must be firmly rooted in an organization's culture before any project or transformation is complete. He furthermore suggested that this required a systematic process to be implemented over an extended period of time. Kotter notes, as an example, that a re-engineering project may typically be declared a success within two or three years of implementation; however, the changes introduced will likely disappear without a concomitant organizational development (OD) initiative to ensure a corresponding evolution in organizational culture. In a longitudinal study of exposure to technological change in an automated distribution plant, employees with greater exposure to change experienced more positive outcomes than those with lower exposure (Axtell, Wall, Stride, Pepper, Clegg, Gardner, & Bolden, 2002). Specifically, higher exposure was associated with increased openness and job satisfaction as well as reduced depression.

Strebel (1996) suggested that most change initiatives fail because they are perceived in different ways by executives and employees. What constitutes an opportunity for executives may be viewed as disruptive or intrusive by employees. In addition, Duck (1993) posited that change may fail because psychological contracts between employers and employees are disrupted. The introduction of EPM, for example, is associated with psychological strain, particularly when it influences perceived workload and control (Schleifer, Galinsky, & Pan, 1995). As ICT may introduce an element of continuous change, the extent to which shared values are promoted and developed may be increasingly relevant.

2.4.5 Training. ICT has clearly generated new, cognitive demands (Ganster, Sauter, & Thomas, 1987), particularly as jobs are increasingly upgraded with the adoption of new technologies (Betcherman, McMullen, & Davidman, 1998). As a result, the ability to adapt effectively may be contingent on the availability of relevant cognitive resources, such as abilities, skills, training, and learning support (Bikson, 1987). As technological change is an ongoing phenomenon, the need to adapt may furthermore be continuous (Cascio, 1995).

As jobs are upgraded, workers must acquire new competencies to meet the ever-increasing demands of the contemporary workplace as well as the ways in which these changes may challenge agency and efficacy beliefs (Bandura, 2001). In addition, training may offer secondary benefits such as increased motivation and perceived security (Methot & Phillips-Grant, 1998). Employees who have received training in conjunction with the adoption of ICT have also

reported higher levels of job satisfaction and organizational commitment (Leckie et al., 2001), although this does not necessarily establish causality. In Canada, firms reporting major technological change coupled with high performance invariably provided comprehensive training (Betcherman et al., 1998). Furthermore, formal training programs, tied to strategic human resource practices, tended to be more effective than informal training (Betcherman et al, 1998). Attention to individual needs and diversity issues may also be important as there is some evidence that technological skills vary according to age, educational level and other demographic characteristics (Leckie et al., 2001). Training initiatives must also be sustained. In a compelling, counterintuitive study, Dolan (1994) found that stress management training interventions exacerbated strain in the absence of adequate follow-up.

2.4.6 Job Burnout. In this paper, the primary focus is on the ICT-job stress relationship; job burnout is treated as a response to chronic stress. Burnout is frequently conceptualized as a stress outcome in the literature, with many empirical studies supporting this hypothesis (Baba et al., 1998). Although researchers have questioned the dimensionality, construct validity, and temporal sequencing of the Maslach model, more than twenty five years of conceptual and empirical research have demonstrated that burnout is a robust, distinctive construct (Cordes & Dougherty, 1993, Lee & Ashforth, 1996; Leiter & Durup, 1994; Maslach et al., 2001).

In Maslach's model, job burnout is conceptualized as a three-dimensional construct. Although the notion of burnout arose in the human service setting, its

relationship to chronic job stress suggested that burnout may also be salient in other sectors, settings, and groups. In response, Leiter and Schaufeli (1996) expanded and reformulated the model, redefining its original dimensions of emotional exhaustion, depersonalization, and reduced personal accomplishment as exhaustion, cynicism, and inefficacy. While a number of researchers have suggested that the symptoms of burnout are similar across hierarchical levels (Lee & Ashforth, 1996), others have found differences (e.g. Burke & Greenglass, 1989, 1993); hence, this is an area which may require further study.

2.5 Summary of Proposed Model and Research Question

Based on the preceding literature, a conceptual model has been developed to explore and examine the impact of ICT on job stress among Canadian workers (see Figure 2.1). The purpose of the research is to identify the ways in which ICT contributes to job stress by using information provided by managers, professionals, and clerical-administrative workers in the NFP sector. The information was gathered in an empirical, qualitative case study. The data collection was guided by research questions aimed at exploring the ICT-job stress relationship, specifically the ways in which workload, control, and community mediate this relationship. Strain and burnout outcomes were explored as well. The extent to which values and training influenced the hypothesized relationships was also examined. It is hoped that this knowledge, in turn, will allow us to identify strategies to attenuate potential stress and strain associated with ICT use, and to tap its potential benefits.

Figure 2.1 – Proposed ICT- Job Stress Model

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                    ┌─────────────┐
                   (  o  Values   )
                   (  o  Training )
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                           ▼
                    ┌──────────────┐
            ┌──────▶│   Workload   │────┐
            │       └──────────────┘    │
  ┌──────┐  │       ┌──────────────┐    │   ┌──────────────┐     ┌──────────┐
  │ ICT  │──┼──────▶│   Control    │────┼──▶│  Job Stress  │────▶│  Strain  │
  └──────┘  │       └──────────────┘    │   └──────────────┘  ┐  └──────────┘
            │       ┌──────────────┐    │                     └─▶┌──────────┐
            └──────▶│  Community   │────┘                        │ Burnout  │
                    └──────────────┘                             └──────────┘
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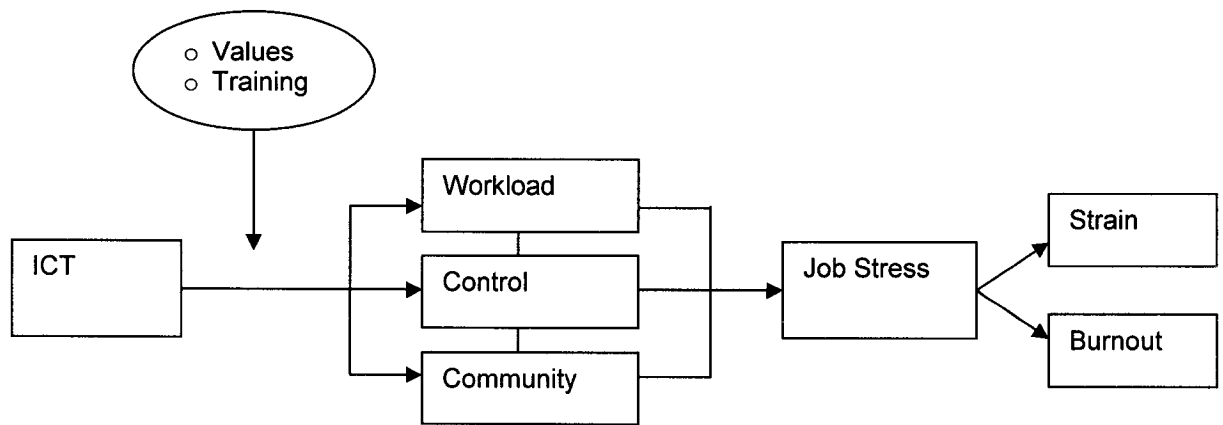
Independent Variable
ICT
• cell phones
• computers
• email
• Internet
• voice messaging

Moderators
Values
Training

Mediators
Workload
• too much work
• work too difficult

Control
• reduced decision
   latitude
• turbulent working
   conditions

Community
• depersonalization
• increased isolation

Dependent Variable
Job Stress
• increased demands
• inadequate resources

Outcomes
Strain
• mental strain
• physical strain

Burnout
• exhaustion
• inefficacy

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Chapter Three: Methodology

The union of the mathematician with the poet, fervor with measure, passion with correctness, this surely is the ideal.
- William James

Not everything that can be counted counts and not everything that counts can be counted.
- Albert Einstein

The research design selected for this project was a multiple qualitative case study. There have been times when qualitative researchers felt compelled if not obligated to apologize for their work (Sutton, 1997). Fortunately, we are not quite living in such an era. Although we may not fully utilize or appreciate qualitative methods (Whitley, 1996), they have gained much currency today (Huberman & Miles, 2002). In fact, the use of qualitative methods is growing as eminent researchers in many disciplines increasingly favour case studies to make sense of complex phenomena, to allow new knowledge to emerge, and to develop well-defined, testable constructs (Eisenhardt, 1989; Mintzberg, 1979; Van Maanen, 1983; Yin, 2003).

Qualitative case studies have yielded particularly robust findings in ICT research. A relatively new, complex, and rapidly changing phenomenon, ICT impact is difficult to define and capture. Hence, the unique properties of qualitative research, particularly its capacity to deconstruct, contextualize, and comprehensively describe events, may be especially well-suited to helping us to better understand, and, eventually, manage technology.

To date, multiple qualitative case studies have yielded more influential, enduring, and reliable findings on the impact of ICT than have other research methods. Fruitful qualitative research includes studies on the evolution of the network organization (Boddy & Gunson, 1996; Nohria & Eccles, 1992), on technology and structural change (Barley, 1990), on the transformational power of new technologies (Zuboff, 1988), on a structurational model of technology (Orlikowski, 1992), and on new patterns of social interaction and communication (Markus, 1994; McKenney et al., 1992; Orlikowski, 2000). In addition to setting out propositions and producing valuable insights, these studies have generated new constructs and extended theories which, in turn, have stimulated further research and knowledge acquisition.

In contrast, experimental and survey research designs, particularly laboratory experiments, have led to a number of unreliable, and at times, spurious conclusions when applied to ICT research. For example, in a series of widely cited laboratory experiments on communication and interaction, Sproull and Kiesler (1991) found that new technology had a democratizing and empowering effect which would break down hierarchical barriers and create more egalitarian workplaces. However, research in natural settings, particularly longitudinal case studies, provided much contradictory evidence (Boddy & Gunson, 1996; Mantovani, 1994; Marcus, 1994; Symon, 2000; Zuboff, 1988), suggesting that the issues associated with participation, social interaction, and work climate may be more contingent, contextual, and complex. The extant inconsistencies in the literature underline the need to select appropriate methods.

In ICT research, qualitative case studies which allow for the development of new constructs, and, consequently, new measures to operationalize and test these constructs, are clearly needed before we can attempt to establish causal links with any confidence.

Survey research on ICT has also been susceptible to error, particularly cross-level bias. For example, in a study on the relationship between social structure and communication technology, Fulk (1993) uses social learning theory, an individual level theory, to formulate hypotheses about group level processes among users of group decision support system (GDSS) technology. These hypotheses are then tested using individual level constructs and measures, such as individual perceptions of job characteristics, which are subsequently aggregated to make inferences about group level attitudes and behaviours. However, relationships at one level of analysis may not hold at others (Mossholder & Bedian, 1983; Nicholson, 1995) even if they have intuitive appeal. In contrast, Orlikowski's (1992, 2000) rich qualitative case studies have led to the development of a powerful, multilevel theory on the interaction of technology and organizations. Predicated on the notion that technology is both a product and a mediator of human action, Orlikowski's model effectively taps and integrates various conceptual streams to expand structurational theory, and to offer fresh, practical insights into organizational design.

Although we have now acquired a more solid body of knowledge on a number of the organizational, technical, and ergonomic issues associated with ICT adoption, research on human and human resource issues, including the

impact of technology on job stress in our everyday work lives, remains somewhat more amorphous and incomplete. Everyday worklife refers to the daily routine and details of work that apply to individuals at various levels, in diverse jobs, in a range of organizations. The rich and comprehensive character of qualitative data, coupled with the robust track record of qualitative studies in ICT, make case study research a logical and potentially fruitful choice. Therefore, the research design selected for this project was a multiple qualitative case study.

3.1 Research Design

The inherent complexity, intensity, and versatility of qualitative research render it at once more robust and more vulnerable to error. Huberman and Miles (2002) have observed that despite a great increase in the volume of qualitative studies, the continuing inadequate attention to process issues, specifically the failure of some investigators to explicate and elucidate procedures for data gathering and analysis, may compromise the credibility and significance of the research. In addition to this potential lack of rigour, biases against qualitative research include a perceived inability to generalize findings and the excessively long and time-consuming nature of case study reports (Yin, 2003). On the other hand, qualitative research facilitates the emergence and acquisition of new knowledge (Sutton, 1997). Also, whereas the demands associated with the review of huge data sets, triangulation, and iterative analysis may be great, the process allows constructs to be more comprehensively defined, and, subsequently, better operationalized (Eisenhardt, 1989). As qualitative and

quantitative research strategies are increasingly seen as complementary, qualitative studies may strengthen both types of research designs.

In recent decades, a set of principles and guidelines have emerged to assist both novice and experienced researchers. Qualitative researchers are particularly indebted to Miles and Huberman (1984, 1994) for developing and championing systematic approaches to data analysis, and to Yin (1984, 1994, 2003) for developing a coherent framework and design for organizing case studies.

As noted, the research design employed in this project was a multiple qualitative case study. The level of analysis was the individual. As shown in earlier chapters, ICTs have altered the nature of work and worklife in all types of organizations and sectors, and they continue to have an important impact on the ways in which we perceive and carry out our responsibilities. Qualitative research on human issues allows us to add critical information on individual perceptions and reactions to our more solid corps of knowledge on organizational, group, and technical issues. In addition to extending theory, enhancing our knowledge in this area offers potential insights into attenuating negative outcomes and exploiting technology more effectively.

Using a multiple case study design enhances the reliability of our findings, and, to some extent, their generalizability (Brannick & Roche, 1997; Miles & Huberman, 1994; Whitley 1996). Multiple cases permit replication, which, in turn, can make our conclusions more robust (Yin, 1994, 2003). While external validity is generally viewed as desirable, minority views nevertheless exist. For example,

Lincoln and Guba (2002) reject the notion of generalizability altogether, suggesting that the contextual nature of case study research makes external validity an impossible goal. Internal validity is not an issue in the present research as this is an exploratory study; consequently, causal links will not be established (Yin, 1994, 2003).

Yin (2003) suggests that the case study method is the research strategy of choice when three essential conditions have been met:

- "how" or "why" questions need to be addressed;

- manipulation of relevant behaviours is unnecessary or impossible; and

- events under study are current and contemporary.

This research project meets all of these conditions. First of all, the purpose of the study is to explore how ICT contributes to job stress among Canadian workers. Second, laboratory experiments have not yielded reliable results in ICT research; hence, manipulating behaviours is not necessarily desirable. Furthermore, inducing stress in participants could certainly be unethical. Finally, the adoption and diffusion of ICT is clearly a contemporary phenomenon.

The current study tested the conceptual framework developed from the literature review. Sampling was carried out within and across cases in an attempt to develop logical generalizations.

3.2   Selection of Research Site and Participants

3.2.1 Site Selection. The research site selected for this study was based on three important criteria: diversity, access, and presence of the independent

variable. To meet the criterion of diversity, organizations with different mandates, job types, and occupational levels were sought. Ensuring contact with individuals throughout the organization and good access to documentation (Whitley, 1996; Yin, 1994, 2003) were also verified at the outset. Finally, all participants had to use ICTs in their everyday work.

The six NFP organizations that comprised the site for this study met all of the essential criteria. All have different and distinctive mandates including advocacy, education, culture, social services, and philanthropy. A stratified sample, consisting of the chief executive officer (CEO), a professional employee, and a clerical-administrative worker was obtained for each case set (see Appendix A). Also, all participants used a variety of ICTs. Half of the executive and professionals were female and half were male. All of the clerical-administrative employees were female. Selecting diverse cases multiplies opportunities to replicate findings (Miles & Huberman, 1994), and, in so doing, to expand theoretical concepts (Eisenhardt, 1989).

Access to the research site was excellent. The investigator is the past president of a human rights organization and a well-known community leader with extensive contacts in the NFP sector. This facilitated full entry into every workplace and included access to individuals, documents, files, meetings, and confidential information. It should be recognized, however, that even as it confers certain advantages, familiarity can be a double-edged sword, potentially

contaminating data gathering by exacerbating reactivity and social desirability bias (Whitley, 1996). For example, some participants, wanting to please or impress an investigator who is known to them, may inadvertently offer misleading information or disingenuous insights. Various strategies were used in order to minimize these threats, including data triangulation, use of robust interviewing skills, and use of interviewing techniques such as probing, integrity checks, and observing body language, all of which will be discussed in greater detail in the next section.

Another important concern is researcher bias. Van Maanen (1979) noted that bias can stem from our own perceptions and assumptions. In other words, we interpret attitudes, beliefs, behaviours, and events through the lens of our own experience and background. Lone researchers, such as graduate students, may be particularly susceptible to subjectivity and over-reliance on intuition (Sadler, 2002). Consequently, vigilance is needed to ensure that the researcher's strengths, specifically her extensive knowledge of the site, and her experience with some of the issues, fortify the data collection and analysis without compromising research findings and conclusions. Here, again, robust interviewing strategies as well as the ongoing juxtaposition of triangulation and iterative analysis of the data were used to counteract bias.

In addition to offering good access, ICT is very widely diffused in NFPs. Over 90 per cent of the organizations in this sector (Bakker, 2000) use new technologies as do over 80 per cent of managers, professionals, and clerical workers throughout the workforce (Statistics Canada, 2001b). In the

organizations studied, the vast majority of workers at all levels routinely used office technologies, regardless of their primary job responsibilities.

3.2.2 Sampling. Although there are no definitive rules regarding the number of optimal cases and participants in a multiple case study, Eisenhardt (1989) has suggested that using between four and ten cases tends to be effective. Fewer than four may not add enough confidence to our findings while more than ten may generate an unmanageable volume of data. Six cases were selected for this study. Unlike survey research, sampling in qualitative case studies tends to be theoretically based, and, therefore, purposive as opposed to random (Eisenhardt, 1989).

Participating organizations were initially contacted by email. A message describing the overall goals of the study, the role of the investigator, and the ways in which the research would be used was sent to the CEO of each prospective organization. Information regarding the number and types of participants required, the timing of the research, and confidentiality matters were also provided. After agreeing to participate in the study, each CEO was asked to identify a professional employee and a clerical-administrative worker. Interview dates and times were then arranged by email or by telephone, depending on the preferences of the participants.

3.3   Data Collection

Conducting robust qualitative research requires both flexibility and rigour on the part of the investigator. Qualitative data can be obtained from numerous sources using a variety of techniques. In fact, gathering and comparing data on

the same phenomenon from distinct sources strengthens our findings. In order to ensure coherence and effective interpretation of the data, we must also establish systematic procedures for organizing and exploiting the information gathered. Respecting these principles, Yin (1994, 2003) has articulated three fundamental strategies to guide investigators:

- drawing on multiple sources of information;

- creating a case study database; and

- developing a chain of evidence.

All of these strategies were employed in this research project.

Using multiple sources of evidence permits triangulation of data, which, in turn, promotes construct validity (Jick, 1979) and strengthens theory building (Eisenhardt, 1989). While acknowledging that there are many possible sources of data, Yin (1994, 2003) describes six predominant types and suggests that researchers use as many of these sources as possible. The sources are the following: documentation, archival records, interviews, direct observation, participant-observation, and physical artifacts.

Information in this case was collected from a variety of sources such as mission statements, corporate brochures, financial statements, annual reports, budgets, organizational charts, personnel records, briefs, media reports, company web-sites, videos, and promotional material. Eighteen semi-structured, in-depth interviews were conducted, and on-site observation, including attendance at meetings and special events was carried out.

Maintaining a comprehensive case study database enhances reliability by allowing for an evidentiary review of the materials and procedures on which the case study conclusions are based (Yin, 1994, 2003). The case study database can include field notes, tapes, documents, tables, and narrative summaries of research questions. A case study database was established for this project. The database contains the following items: the interview protocol, tapes, notes, and annotated transcripts; field notes and summaries; documents and other material collected at the research site; multiple versions of tables and matrices; electronic files; and records of email correspondence.

Maintaining a well-ordered, comprehensive inventory of case material not only facilitates a review of the project but also it increases the likelihood that the same conclusions would be reached by other researchers. In this way, a chain of evidence, namely the possibility of conducting a step-by-step review or audit is established.

3.3.1 Interview Guide. This research project was initially driven by a global proposition, expressed in general terms. The starting point for the study was an exploration of how ICT contributes to the job stress of Canadian workers. The research was inspired by impressionistic observations of individuals in different natural settings, by personal experiences in various organizational contexts, and by current directions and concerns in stress research. Once the central question in the study was identified, general themes were outlined to guide the preliminary literature review.

In the course of the literature review, these themes became more refined and focused, and others emerged. Although the number of ICT studies examining psychological variables was surprisingly limited, some patterns were nonetheless discernible. For example, some of the work that had been done seemed to converge in themes such as cognitive demands, perceived control, and fragmentation of communal identity. In addition, the stress and burnout literatures offered valuable insights and useful theoretical frameworks to guide and stimulate model building.

As the conceptual framework for the study took shape, a comprehensive interview protocol was formulated. A draft interview guide, based on an extensive set of variables and their hypothesized relationships, was pilot tested in an agency that shared a number of organizational characteristics with the organizations participating in the field study. The pilot study also used the same type of stratified sample that was later employed in the field study.

Subsequent to pilot testing, the interview guide was edited, revised and streamlined. The final instrument consisted of a two-part, semi-structured interview (see Appendix B). A semi-structured design was selected as it permits the exercise of both flexibility and rigour (Whitley, 1996). Some flexibility and open-endedness are essential in an exploratory study as they allow new knowledge to emerge and take shape (Brannick & Roche, 1997; Miles & Huberman, 1984, 1994). The systematic use of standardized questions promotes construct validity (Yin, 2003) thus facilitating cross-site comparison and making our findings more reliable (Eisenhardt, 1989; Miles & Huberman, 1984, 1994).

The two parts of the interview guide consisted of a small section directed exclusively at CEOs and a larger section aimed at all participants. The purpose of the CEO section was to collect some background and contextual information related to ICT adoption and diffusion. Hence CEOs were asked to provide an overview of technology use in the context of their organizations and work environments, and to articulate and reflect on key issues related to the adoption of new technologies, including human resource issues. The second and main part of the interview, completed by all participants, consisted of a series of questions derived from the literature review, model, and research questions. The main section of the interview tapped workers' perceptions of all key variables as well as the hypothesized relationships between and among variables.

3.3.2 Interview Procedure. All interviews were tape recorded and transcribed. Although Yin (1994) recommends distributing the interview guide prior to the interviews to allow participants to prepare more focused and well-thought out responses, the interview guide was not circulated in advance in this case in order to maximize spontaneity and integrity, and to reduce potential threats to validity. As the investigator was known to the participants and the communities they serve, and as the interview guide contained a number of sensitive, personal questions, the dangers of reactivity and social desirability bias were considered to be high. Furthermore, experienced interviewers, such as the investigator, can mitigate some of the potential shortcomings associated with a lack of previewing time by using effective skills and techniques, such as warm-up

periods, probing, and redirecting questions to maximize available time and to control interviews.

Whitley (1996) has identified five important components of effective interviews. They include:

- creating a productive climate;

- identifying and addressing "poor" responses;

- probing respondents;

- motivating respondents; and

- maintaining control of the interview.

In this project, many steps were taken to ensure that these elements were respected. First of all, each interview began with a warm-up period of about five minutes in order to relax the participants. Also, background information on the research project was provided at the outset. This included a brief outline of the research goals as well as an overview of the interview objectives and the types of questions that would be asked.

In addition, all participants were assured of confidentiality. Miles and Huberman (1994) have cogently argued that a lack of assurance on confidentiality can lead to strained relationships and bias. This concern would appear to be particularly salient in studies focusing on psychological states. In the absence of confidentiality, respondents might be more inclined to assess the impact of their responses on their own interests; clearly, this could limit and constrain communication and candour. Also, investigators have an ethical obligation to protect participants. If the identities of participants are publicly

known, it might be necessary for the investigator to withhold some of the information gleaned; this could also compromise the overall quality of the research report.

Insofar as poor responses are concerned, the following types were identified as being inadequate: one-word answers, including responses that did not address the question; answers that contradicted other responses; and ambiguous answers. In these cases, probing was used to elicit more detailed information and reactions, to allow feelings to emerge, or to clarify responses. These ends were achieved by asking respondents to provide explanations and examples or to amplify and expand on remarks made elsewhere in the interview. As well, some questions, including those which made participants uncomfortable, were rephrased and/or gently reintroduced later in the interview.

In a variation of probing techniques, the use of "integrity checks," the repeating testing of key variables throughout an interview or questionnaire, was effectively imported from selection interviewing methods and integrated here to enhance reliability and to clarify ambiguous responses. For example, some participants felt that technology did not contribute to job stress in response to a direct question on the topic, but in response to other questions, they stated that their workloads had become "unbearable" as a consequence. Similarly, others compared ICT to being "sprayed with bullets," being "run over by a train," or being submerged in an "avalanche."

Active listening techniques were used throughout the interviews to motivate participants to continue speaking, to provide more relevant detail, and to

elaborate on their answers. The techniques employed included non-judgmental body language such as neutral or sympathetic facial expressions, as well as positive gestures such as nodding and smiling. Interjections such as "yes," "uh huh," and "I see" were also used to encourage participants to continue speaking. As well, some notes regarding interviewees' body language were also taken and used carefully and judiciously. For example, one participant repeatedly avoided eye contact when referring to organizational loyalty and intent to stay with a particular agency.

The interviewer maintained control throughout the interviews by ensuring that all topics were covered and all standardized questions were asked. Departures from the interview guide were managed by the interviewer and tangents were contained. Efforts were made to strike a reasonable balance between creating a relaxed atmosphere and remaining focused.

All interviews were taped and transcribed. As well, detailed notes were taken during the interviews. Key quotes and comments made by participants were written down, as were the interviewer's observations on sociolinguistic features such as tone, style, and register. Interviewer observations regarding body language were also noted where relevant. Interview summaries were drafted as soon as possible, following each interview. Interviews with clerical-administrative workers ranged from 40 to 50 minutes, interviews with professionals ranged from 50 minutes to approximately one hour, and interviews with CEOs ranged from one hour to ninety minutes. Without exception, participants were insightful, forthcoming, and generous with their time and views.

Many appreciated the opportunity to discuss and reflect upon some of the topics broached, and they expressed a willingness to participate in follow-up research activities. Unfortunately, time and budgetary constraints did not permit return visits to further elucidate, confirm, or challenge emerging findings.

3.4   Data Analysis

In this study, comprehensive efforts were made to engage in both deductive analysis, based on the literature, and inductive analysis, based on the data. Although a firm grasp of the literature helps guide the researcher, and good theoretical anchors help to validate the research, it is the inductive capacity of qualitative research, its potential to uncover new knowledge, which truly distinguishes this approach.

Both Yin (2003) and Eisenhardt (1989) have observed that qualitative research can become very challenging at the stage of data analysis as there does not exist a definitive set of procedures to follow. Miles and Huberman (1994), pioneers and leaders in the area of data analysis, have recommended that three steps be implemented following data collection:

- data reduction;

- data display; and

- conclusion drawing and verification.

All of these strategies were employed in this project. First, transcripts and field notes were read repeatedly in order to identify, uncover and understand emerging patterns and concepts. Then data in the notes and transcripts were

thematically coded to facilitate analysis and revision of the conceptual framework. Next the data were displayed in matrices to permit clear, coherent interpretation and verification of the results.

Data reduction refers to the process of transforming voluminous quantities of field notes and transcripts into more focused, simplified, and abstract formats. In this case, over 350 pages of transcripts and field notes were collected. The data were coded continuously: during data gathering, after the fieldwork ended, and while this research report was being drafted.

Data display techniques involve the transfer of coded data into condensed and abbreviated formats to facilitate conclusion drawing (Miles & Huberman, 1994). In this study, matrices and charts were used to present coded data. The tabular displays also permitted some quantitative analysis, such as counting people or calculating frequency of events; this, in turn, facilitated verification and strengthened confidence in the findings (Eisenhardt, 1989; Miles & Huberman, 1984).

Conclusions are developed continuously in qualitative research (Miles & Huberman, 1994), and can take many forms including patterns, explanations, propositions, and descriptions (Miles & Huberman, 1994; Yin, 2003). Conclusion drawing and verification in this study reflected an intensive, iterative process of continuous comparison and revision, whereby the data in the first case set were compared to the conceptual model, the conceptual model was adjusted, the adjusted model was subsequently reviewed and compared to the next case set, and the entire process was repeated until all cases had been reviewed. As the

iterative process drew to a close, the literature was revisited to further clarify research findings, to help formulate conclusions, and to revise the original model.

The data gathered for this study were analyzed both within and across cases. First, individual cases were described and treated as single experiments to allow their unique properties to emerge (Yin, 1994, 2003). Then a cross-case analysis was conducted, using variables in the model to compare individual results.

Chapter Four: Results

It is OK to plan – just not to plan the outcome.
- Anonymous

I claim not to have controlled events, but confess plainly that events have controlled me.
- Abraham Lincoln

Research results will be presented in two parts: a description of each case set followed by a cross-case analysis (Yin 1994, 2003).

4.1   Individual Case Analysis

Each case description will include background information on the organization, an overview of ICT use, a synopsis of ICT and stress in the organization, and a summary of the perceptions of each interviewee. Organizational information was obtained primarily from interviews with the CEOs, and from corporate literature and documents. The body of information gathered further came to life through on-site observation, including attendance at meetings and special events.

Each participating organization is managed by paid, professional employees who are accountable to a lay president and Board of Directors. Pseudonyms were assigned to all organizations to maintain confidentiality. The quotes used in the reports represent general trends, recurring themes, and typical styles of discourse.

4.1.1 Advocacy.

There's a danger because we haven't come up with a new set of rules that helps us organize and separate urgent matters from those that aren't time-sensitive, from those that are not at all urgent. And I resist that. ... We're supposed to be deciding what's really, really important and what can wait a bit. And the phone's ringing, so you answer it, and that's your crisis for that moment when maybe it's not. And whereas five years ago, it would have been maybe somebody influential calling you and knocking you off your agenda legitimately, now, it's anybody and everybody knowing that they can reach you or knowing that you would have heard their message within ten minutes.
- Executive Director, "Advocacy and Public Affairs Council"

The Advocacy and Public Affairs Council (A-PAC) represents a constituency of over 350,000 Canadians to all levels of government on matters of public policy and human rights. A grassroots organization, with elected officers and Board members, A-PAC maintains a wide communications network which includes political leaders, government officials, non-governmental organizations (NGOs), and the media. Working on its own and in concert with other organizations, A-PAC promotes tolerance, diversity, interfaith dialogue, and human rights while striving to combat racism, discrimination, antisemitism, and xenophobia. The Council speaks and acts on a wide range of humanitarian and social justice issues, both in Canada and around the world. It regularly presents briefs to government bodies, issues press releases, publishes newsmagazines, and organizes lectures and conferences. The Council has also intervened in landmark court cases involving hate crimes and human rights issues. A-PAC is funded by philanthropic organizations, private endowments, and government

grants. The Executive Director, Communications Officer, and an Administrative Assistant were interviewed for this study.

ICT Use

All A-PAC managers, professionals, and clerical workers use computers, email, Internet, and voice messaging. Managers and professionals use cell phones as well. According to the Executive Director (ED), most employees have the necessary skills to effectively use ICT in their work. Both the ED and the Communications Officer (CO) felt that they and their colleagues were not fully exploiting the technologies at their disposal. This was attributed to a lack of time to explore and test the possibilities. Although all staff have had some training and orientation, they do not always avail themselves of training opportunities due to time constraints. The Council does not have a formal mechanism to assess and develop organizational competencies, including ICT use, nor does it have a career development program, but there is a perceived need to develop more comprehensive and coherent strategies in these areas.

A-PAC uses ICT for both internal and external communications. The Council recently upgraded its database system in order to manage its extensive network of contacts more effectively. Most written material, from minutes of meetings and newsletters to briefs on impending legislation, is circulated by email. ICT has enabled the organization to cut one receptionist position and to create a new support staff position in research and communications.

ICT and Perceived Stress in the Workplace

ICT has had both a positive and a negative impact on A-PAC employees. Some routine work, such as mass mailings, can be carried out more quickly and efficiently, allowing employees to perform other tasks and engage in work they consider more interesting. On the other hand, ICT has introduced new demands into the workplace.

Three major concerns were articulated by the ED. First of all, he felt that ICT use, particularly email and cell phones, had "blurred the lines with respect to when you're on duty and when you're not." As much of the Council's work involves issue and crisis management, A-PAC employees often spend long hours in frequent, intense, and rapid communication with their elected officers, government officials, politicians, and the media. Hence ICT can at once facilitate and exacerbate communications capability and load. Second of all, the ED suggested that technologies had significantly raised expectations regarding the quantity and quality of work each employee could produce. For example, Board members now expect to be apprised frequently and in detail on every issue on the Council's agenda, due to the perception that ICT facilitates depth, breadth, and frequency of reporting capabilities. Finally, he noted that when technologies dictated work organization, they could dilute individual control and accountability.

The View from the Executive Office

The ED is a married man with young children. He has been with A-PAC and in his current position for close to five years. Prior to his arrival at the Council, he headed a similar organization for 10 years. The ED felt that ICT had a "nominal" effect on his level of personal stress; he suggested that technology

had both improved and exacerbated his ability to do his job. On the one hand, ICT had imposed more work by facilitating multitasking; on the other hand, it had allowed some tasks to be streamlined. Due to the reactive nature of his work, particularly the crisis management aspects, the ED felt that he had "fairly limited" control over prioritizing and scheduling his workflow. In addition, he thought that ICT compounded existing constraints by facilitating others' access to him, thereby increasing the amount and frequency of interruptions he experienced at work. Like his colleagues, the ED works long hours, evenings, and weekends due to a strong belief in the importance and value of his work, specifically its ability to protect and serve the wider community. He expressed concerns about technology's potential to blur the boundaries between work and home life, and stated that he had consciously and deliberately established barriers, such as turning off his cell phone in the evening, to reduce work-life conflict. Although he felt that ICT had generally enhanced his ability to communicate with others, the ED noted that voice messaging and email had also caused more tension in interpersonal relationships in the following circumstances: when voice messaging systems were used to avoid FTF communication on sensitive issues; and when email had a disinhibiting effect on workers, leading them to send emotive and aggressive messages.

Professional Perspectives

The CO is a single woman with no children. She has been with the Council for four years. While ICT has enabled the CO to do her job more quickly and efficiently, it has also added to her stress level by creating higher

expectations about personal accessibility, productivity, and turnaround time. Always available to the media, colleagues, supervisors, and constituents, the CO is on call 24 hours a day. She regularly monitors the Internet and other media outlets, including 24-hour news services, and she receives approximately 300 emails daily. When an issue is critical or a crisis erupts, she is connected to her cell phone, computer, email, Internet, and voice messaging systems, day and night. Like the ED, the work of the CO is characterized by frequent interruptions and shifting priorities; consequently, she feels that she has "little control" over her workflow. The CO also felt that ICT has put pressure on her to take on more work than she can or should. For example, the availability of graphic design programs coupled with the ease of email distribution networks has greatly increased the number of newsletters and publications that she produces. The CO suggested that the informal nature of email created a more "intimate" style of communications that "facilitates relation building" among professionals; also, its expedient nature had allowed her to build a more extensive network of contacts. However, maintaining a vast network was also time-consuming; hence, it had ultimately become a "burden." Although her work interfered with her personal life, the CO's strong work ethic and belief that the Council provided a valuable service to its community mitigated negative consequences and motivated her to continue. She also speculated that it would be more difficult for her to function in the same way if she were married with children.

Clerical-Administrative Perceptions

The Administrative Assistant is a married woman with no children. She has been with A-PAC for over 20 years, beginning as a clerk and taking on progressively more senior secretarial roles. The Assistant stated that ICT "could be your best friend or your worst enemy." Although it has helped her to do her job better, by facilitating access to information, and by streamlining laborious tasks such as mass mailings, it has also generated more stress by contributing to perceived "overload of work," and by creating conflicting demands. She also felt that the need to work more quickly increased the potential for error, which, in turn, added to her personal stress. Increased work and job demands include data entry and maintenance, tighter deadlines, and more information processing and output. Increased expectations about the amount of work that can be achieved due to the availability of ICT have also created conflicting, and at times, unreasonable demands. For example, the Assistant can be asked to simultaneously prepare and send a mass mailing, confirm meeting attendance by telephone, download and re-format information from the Internet, and run off a large quantity of photocopied material. In general, she felt that she can schedule about 30 per cent of her time at work, not as much as she would like. She also works long hours and spends approximately three evenings a week at the office. Sometimes, her husband complains that she is not home when she "should be home." Equipment breakdowns are an additional source of stress. The Assistant spends approximately 70 per cent of her time on the computer and has experienced increased physical strain, such as headaches and visual disturbances, as a result. While electronic communications have made it easier

to keep in touch with people, she also felt that they have trivialized communication by removing the "personal touch" inherent in FTF communication. Adapting to new technologies is initially stressful for the Assistant, but the anxiety is eventually replaced by a feeling of "pride" and accomplishment.

4.1.2 Education.

> The avalanche of communication that I encounter ... takes away time that otherwise would have gone to thinking because you have now snail mail to deal with, you have voice mail and email ... And the quantity of mail that we get ... sifting through it and seeing what is pertinent and what is not pertinent ... I think to some extent it has reduced the time that we have available for actual creative thinking.
> - Executive Director, "The Private Education Network"

The Private Education Network (PEN) acts as a board of education for over 8,000 children in 25 private elementary and secondary schools. The central planning and coordinating body for the schools it serves, PEN oversees all pedagogical and administrative matters, including program management, curriculum development, school budgets, IT, and teacher training. PEN also manages and distributes scholarships, and maintains an Educational Resource Centre. It recently developed and implemented a special needs program for intellectually challenged children. PEN is funded by the schools and the community it serves. The Executive Director, Assistant Director, and a Senior Secretary were interviewed for this study.

ICT Use

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All of the managers, professionals, and clerical workers at PEN use computers, email, Internet, and voice messaging. The ED has access to a cell phone, but he does not use it by choice in an effort to establish work-life boundaries and reduce interruptions. According to the ED, all PEN employees have the necessary skills to effectively use ICT in their work. Whenever new technologies are implemented, consultants are engaged to provide training. The Network does not have a formal career development program due to "budgetary constraints," but it does have an annual performance evaluation process during which individual needs are identified. The ED suggested that PEN was more "reactive than proactive" in assessing and developing organizational competencies, including ICT capability. PEN recently set up an IT department which provides consulting and training services to its schools. ICT has also facilitated several organizational changes in its curriculum development department, including an increase in the number of professional staff, the addition of shiftwork, and some use of telework. As no new secretaries or clerical workers have been hired to support the increased number of professional positions, the overall number of support positions has declined. Furthermore, some support staff positions have been eliminated by attrition. PEN uses ICT for both internal and external communications, but not all schools have the same technological capabilities; consequently, different media are used to communicate with the various institutions in the Network.

ICT and Stress in the Workplace

The ED noted that ICT has had both a positive and a negative impact. Positive changes include increased productivity at the board and school levels as well as streamlined financial management and administrative procedures. On the other hand, the ED felt that technology had contributed to job stress by exacerbating workload, particularly information overload; by reducing time available for reading, reflection, and creative thinking; and by requiring professionals and managers to do more secretarial work. The ED rejects a deterministic view of technology, suggesting that its impact is contingent on organizational values. For example, in describing the ways in which ICT-related decisions are formulated at PEN, he made the following observation:

> *I think ... participation in decision-making ... is not necessarily connected with this technology. I think it has to do more with the disposition of an organization; with the climate; and with the ethos of an organization, to what extent it's an open-minded organization that involves its employees, its members in decision-making. And I would say that that's what influences. It's not as a result of technology.*

The ED noted that most PEN employees were very dedicated to their work and their belief in its inherent value engendered a willingness and motivation to "invest beyond the call of duty."

The View from the Executive Office

The ED is a married man with grown children. He has been in his present position for 17 years. On the whole, the ED felt that ICT had enhanced his ability to do his job by improving communication capabilities, specifically the capacities to maintain frequent contact with a large number of people and to acquire data rapidly. In terms of the impact of ICT on his personal level of stress, his principal concern was that information overload reduced time available for creative

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thinking and reflection. On the whole, the ED felt that his workload had grown as a result of ICT, particularly due to the amount of information he was obligated to sort, digest, and assimilate on a daily basis. Although he works very long hours, including evenings, he feels that he has been able to control work-life conflict by minimizing weekend work. He also uses some traditional gatekeeping strategies, such as having assistants monitor and respond to routine email and other correspondence. Furthermore, his wife is a professional employee at PEN; hence, their schedules often coincide. Also, their values are compatible. The ED felt that he was able to control his work around 70 per cent of the time. Dealing with school issues and other organizations accounted for most of the interruptions he experienced, and he felt that ICT had a limited impact on these disruptions.

Professional Perspectives

The Assistant Director (AD) is a married woman with dependent children. She has been with PEN for two and one-half years. Prior to working with the Network, she held a variety of teaching and administrative positions in other institutions, including several universities. Like the ED, the AD felt that technology facilitated rather than dictated work. She also believed that having a "heavy" workload was inevitable in the NFP sector, but that this was mitigated by the inherent importance of the work and its contribution to the organization and the wider community. The AD stated that ICT had not added significantly to her personal workload although she suggested that workloads, in general, have grown:

Everybody's workload has increased with the availability of email and faxes because the information comes to you very quickly. So you're also expected to respond very quickly. And I think that that, contrary to what people originally thought, that we would have more leisure time ... it turned out to be the opposite ... It doesn't make less work. It just gives you more opportunity to do more things.

One consequence for the AD is that she now does much of her own secretarial work. Although she generally felt that ICT was an asset, the AD expressed three concerns about its impact: the facilitation of multitasking, the immediate response expectations, and the disinhibiting potential of email communications. She felt that both multitasking and the expectation of an immediate response exacerbated the potential for making errors. Expectations of immediate feedback also added pressure, reduced reflection time, and contributed to stress:

I think that, again, the only stress that there is, is the fact that everybody wants everything faster and faster. But we have to be realistic. Technology is still something that's used by people. You can only type so fast. You know, if there were voice-activated computers, and you could do everything just by talking, it would still require you to do the talking. We're not machines. We are still human.

The AD noted that the injudicious use of email could contribute to conflict and tension in the workplace. She cautioned that quick reactions could result in "angry" or indiscriminate messages, adding that, "I have received e-mails written entirely in capital letters. And you know what, it's meant to be in your face, to get your attention."

Clerical-Administrative Perceptions

The Senior Secretary is a married woman with grown children. She has worked at PEN for 23 years, beginning in a part-time position and assuming

progressively more senior secretarial roles. The Secretary felt that ICT had enhanced work and upgraded her job, but that it had also added to her workload, increased expectations, and created conflicting demands:

> *We're always on overload. There's always pressure. It's a very high pressured office. To the point that sometimes we fight amongst each other, we get on each other's nerves. But a large workload doesn't bother me. I'd rather have more work than less work.*

The Secretary stated that she spends most of her day on the computer. She feels that her job has become more interesting as a result of ICT as she now does less routine clerical work, such as filing, and more graphic design, research, and formatting of documents. On the other hand, she feels that ICT has created the expectation that everything can be done "equally and quickly." This is compounded by the fact that the professional staff complement at PEN has grown without a proportionate increase in the support staff complement; hence, more people are vying for secretarial time, often at once. Although she found this stressful, the Secretary said she copes with conflicting demands by referring problems back to the professionals and managers who are making simultaneous demands and by asking them to establish priorities. The Secretary suggested that email had brought people closer together at work, both within and outside of the organization, by facilitating more frequent, rapid, and personal communications.

4.1.3 Housing.

> *Other organizations or other companies that we're dealing with ... and even the government expect to have more research, more data, more information. And a lot of times, I find that it takes away from the actual job that we do have to do to serve the people ... We're not in the business of research. But the expectation is still there.*

- Executive Director, "Harbour Village"

Harbour Village, a retirement community comprised of four modern buildings, provides subsidized housing for ambulatory and semi-autonomous senior citizens. Tenants in the Village live in fully equipped studio and one-bedroom apartments, and they have access to a wide range of cultural and recreational programs. An assisted living program, including housekeeping services and meals, is available to semi-autonomous seniors. Monthly rental fees at Harbour Village consist of thirty per cent of residents' incomes, including pensions. The Village's operating costs are supplemented by government subsidies, budget allocations from centralized fund-raising agencies, corporate donations, and private endowments. Interviews at Harbour Village were conducted with the Executive Director, Controller, and Program Coordinator.

ICT Use

All Harbour Village managers, professionals, and clerical workers use computers, email, Internet, and voice messaging. Managers and professionals use cell phones as well. According to the Executive Director, approximately three out of four employees have the skills they need to use ICT in their work. Training is provided whenever new technologies are introduced. Both the ED and the Controller felt that Village employees were not using ICT to its full potential due to a lack of time to experiment with various options and possibilities. Also, it was felt that some senior staff members were reluctant to modify their existing work habits. Harbour Village does not have a formal mechanism in place to assess and develop organizational competencies, including ICT use. The ED is currently

developing a performance evaluation process which she sees as a first step. Although the Village does not have a career development program, individual training needs are identified by the ED, supervisors, and employees themselves, and they are addressed on an individual basis. Harbour Village uses ICT for both internal and external communications. The Council recently upgraded its database system in order to manage its extensive network of contacts more effectively. Most reports, announcements, and other written material are distributed by email. Though driven by the need to reduce costs, ICT has enabled the Village to eliminate several accounting, bookkeeping, and other clerical positions. However, this has added to the workload of other staff members.

ICT and Stress in the Workplace

ICT has had both a positive and negative impact on employees. On the one hand, it has facilitated record-keeping, data collection, and accounting procedures; on the other hand, it has introduced new demands and expectations. The ED and Controller identified two principal sources of increased stress associated with the adoption of ICT: increased workload, due to expanded reporting obligations, and more frequent interruptions at work. All interviewees felt that the value of the service they provided mitigated some of the stress they experienced.

The View from the Executive Office

The ED is a single woman with no children. She has been with the organization and in her present job for four years, and she arrived with over 12

years of professional and supervisory experience in community-based organizations and agencies. The ED works long hours, including evenings and weekends, and she feels "totally exhausted" at the end of the day. She considers her job to be very demanding, and she has been treated for anxiety related to work overload. The ED feels that technology has exacerbated her level of personal stress by adding to her perceived workload, particularly the reporting requirements; in addition, it has generated work-life conflict and reduced control. In describing the relationship between her workload and her home life, she stated, "I don't have a home life. Thank God I'm not married; I don't have any children. I don't know how I would do this job if I was married and had children." The ED feels that she controls about half of the time she spends at work. The rest of the time is characterized by interruptions related to tenant and staff problems. The ED felt that the use of cell phones, email, and voice messaging had increased the number of "intrusions" she experienced. On the other hand, she felt that email facilitated and streamlined routine correspondence.

Professional Perspectives

The Controller is a married man with dependent children. He has been with Harbour Village, in his current position, for 14 years. In addition to managing the financial affairs of the Village, the Controller is now responsible for all matters related to IT. He spends about 90 per cent of his time working on the computer. The Controller works long hours, including evenings. He tries to manage work-life conflict by going to the office early or leaving late as opposed to bringing work home. Although he generally viewed technology as an asset that has greatly

streamlined his work, saved time, and reduced accounting costs, it has also introduced new demands, such as increased interruptions and reporting obligations. Other sources of stress include equipment breakdowns and reduced access to support services. The combination of increased expectations in reporting, a smaller clerical staff, and reduced access to outside accounting firms or consultants has added substantially to the Controller's personal stress, causing sleep disturbances and creating work-life conflict. The Controller said that he derived considerable satisfaction from spending time with seniors and assisting them with their problems and personal business. He noted that, in contrast to working in other organizations and other sectors, "here you deal with people all the time ... I like more a human side." The Controller felt that this cushioned the stress and strain inherent in the job.

Clerical-Administrative Perceptions

The Program Coordinator is a married woman with dependent children. She has worked at Harbour Village in her present position for three years. The Coordinator stated that she was "totally dependent" on the computer and could not do her job without it. Technology allows her to be more organized and efficient. In addition, she finds that spending a lot of time on the computer is "relaxing" as it allows her to separate herself from the outside world and immerse herself in her work. The Coordinator stated that her job was very demanding and "needed more than one person," but she did not feel that technology added to her workload. The Coordinator identified one source of technology-related stress: equipment breakdowns. She suggested that email had brought people "closer"

together at work by increasing communication and support, but she noted that one had to "choose words more carefully."

4.1.4 Immigration.

I would sooner write somebody an email than pick up the phone and call them or walk down to their office, which is bad. I think it's taken away from the face-to-face conversations, the more direct communication.
- Executive Director, "Associated Immigration Services and Support"

Since its inception over 80 years ago, Associated Immigration Services and Support (ASSIST) has helped hundreds of thousands of immigrants and refugees resettle in Canada. ASSIST offers a variety of counselling and educational services to facilitate the legal entry and integration of immigrants and their families. Pre-arrival services include paralegal counselling on immigration procedures, help in completing immigration forms, and intervention with government agencies. On arrival, ASSIST provides orientation to life in Canada, housing information, financial advice, psychological counselling, and help in negotiating the education and health care systems. Once immigrants and their families are ready to settle into their new lives in Canada, the agency provides language training as well as a variety of cultural, educational, and recreational programs. ASSIST works with over 100 newly-arrived families every month. The agency also maintains close ties with cultural communities and their institutions to further promote and facilitate the effective integration of immigrants. ASSIST is funded by a centralized fund-raising agency, government grants, and private endowments. The Executive Director, Coordinator of Programs and Services, and Executive Assistant were interviewed for this study.

ICT Use

All ASSIST managers, professionals, and clerical workers use computers, email, Internet, and voice messaging. Managers and professionals use cell phones as well. According to the ED, most employees have or are in the process of acquiring the skills they need to incorporate ICT into their work. Both the ED and the Coordinator of Programs and Services felt that ASSIST was just beginning to exploit available technologies. For example, many social workers had just started using email in the last six months. The agency recently emerged from a five-year period of internal turmoil, characterized by frequent turnover, which culminated in legal and substantive changes to its governance structure and funding. During this period of upheaval, little time and energy were devoted to upgrading organizational competencies. The new ED has embarked on a major reorganization of the agency, including the introduction of an automated telephone system and intranet as well as a new database to track clients. Training is provided whenever new technologies or programs are introduced.

ASSIST is increasingly using ICT for both internal and external communications. The agency has been working with many prospective immigrants from South America who are computer literate and who favour email correspondence; consequently, the agency has been providing more and more services over the Internet. Although ASSIST has not laid off any staff members subsequent to the introduction of new technologies, ICT has enabled the organization to retrain and redeploy staff. For example, the former receptionist

now manages the agency's newly designed website and works on grant applications.

ICT and Stress in the Workplace

As some technologies have been recently introduced, some agency staff members have been experiencing acute stress and anxiety related to the pressures of dealing with new cognitive demands and adapting to change. Both the ED and the Coordinator also noted that senior social workers, accustomed to FTF communications and to working in a high touch environment, were particularly reluctant to use email and voice messaging systems. For similar reasons, the introduction of an automated receptionist had been controversial. Other general sources of stress related to technology include increased expectations of immediate response and overload of information.

The View from the Executive Office

The ED is a single woman with no children. She has been with ASSIST in her present position for approximately one year, and she arrived with over 20 years of related experience. Consequently, she knows and understands the environment well despite her brief tenure. While the ED thought that ICT had enabled her to work more efficiently, she also felt that it was contributing to her personal stress by inundating her with information, blurring the boundaries between work and home life, increasing interruptions at work, creating expectations of immediate responses, and "depersonalizing" communication with clients and coworkers. The ED can receive over 30 emails an hour during busy periods; consequently, she was "often bogged down in it, which takes me away

from other things." In the course of the interview, she noted that "that machine keeps pinging and I know it's waiting there for me. That's probably the most stressful." The ED works long hours and takes work home at least once a week. She is proud of the changes she has implemented in the agency and the important role that it plays in the community at-large.

Professional Perspectives

The Coordinator of Programs and Services is a single man with no children. He has been with ASSIST for seven months. Prior to joining the agency, he held a variety of positions as a social worker and administrator in several public establishments and schools. The Coordinator felt that although he was more involved in his work as a result of ICT, it also made his job more difficult by adding to his perceived workload, causing physical strain, increasing interruptions at work, and blurring the boundaries between work and home life. He volunteered that technological demands had caused him to experience burnout in his previous position, and that his current job imposed similar demands. The Coordinator found his workload to be "heavy, sometimes overwhelming" as he is responsible for implementing the new client database and other IT projects in addition to maintaining a caseload. He also found staff resistance to technological innovations "frustrating." The Coordinator felt that while ICT made communication more "impersonal," it also enabled him to communicate with more people more frequently. He felt that the quality of service in the agency was improving, but slowly.

Clerical-Administrative Perceptions

The Executive Assistant is a divorced woman with grown children. She has been with ASSIST for over 36 years, beginning as a summer intern, and assuming increasingly senior secretarial roles. The Assistant feels that ICT has enhanced her quality of work life by making her job easier and more interesting. "In terms of Internet, I'm logged on 24 hours a day, practically. Like, it's my life." On the other hand, she felt that email communication "generates more work," "takes longer than picking up the phone," and requires her to take work home almost every day. The Assistant felt that long periods spent on the computer led to headaches, eyestrain, and fatigue, and she found equipment breakdowns to be a source of stress. The Assistant felt that she had little control over her work as crisis management formed an integral part of the agency's job; however, she did not consider this to be a problem as the "sense of accomplishment" she derived from her work outweighed the stress and strain. Although ICT made her more accessible to others, and, consequently, created more interruption on the job, she did not consider this to be a problem.

4.1.5 Library.

Sometimes it is too much. I should be doing much more of my thinking here. I should be doing more of my writing here. I should be using the resources here more. And my days fritter away. My days fritter away between the email, the voice mail, and responding to these kinds of things.
- Executive Director, "The Martin Luther King Public Library"

The Martin Luther King Public Library is a multilingual library. King's collection includes over 150,000 volumes in five languages as well as archival

documents, photographs, manuscripts, digital media, and specialized collections. In addition to providing a full range of library services, King organizes and delivers over 100 cultural and educational programs, including concerts, plays, films, conferences, lectures, book launches, author readings, discussion groups, courses, and excursions. It also operates a children's library which runs daily and weekly programs and organizes special events. King is funded through annual campaigns, special events, membership fees, and endowments. The Executive Director, Head of Circulation, and an Accounting Clerk were interviewed for this study.

ICT Use

All King managers, professionals, and clerical workers use computers, email, Internet, and voice messaging. The ED uses a cell phone as well. Technological competencies vary a great deal at the library. The ED noted that:

Some people have taken to this like ducks to water and have just grabbed the technology and run with it. I have some staff people here who just keep pushing the edge of the envelope, wanting to do everything, everything possible as quickly as possible. And there are other people who are just falling farther and farther behind.

ICT has transformed all aspects of library work, creating a fluid environment, characterized by constant change. "What's frightening," suggested the ED, is that "things used to change and then you'd live with it for fifteen years or something. And now it's monthly." King has provided some training to help employees adapt, but it was felt that more is needed. The ED has made training a priority for the coming year, despite budgetary constraints. She is also reviewing the library's

performance evaluation system with a view to focusing more on core competencies, tying rewards to performance, and integrating training objectives.

King uses ICT for both internal and external communication, including notices of meetings, minutes, and reports. ICT has both created and eliminated positions at the library. For example, a new multimedia centre, which includes an IT department, was set up several years ago. New jobs include positions in network administration, multimedia, and educational services. Staff occupying redundant positions have been retrained or have taken early retirement.

ICT and Stress in the Workplace

ICT has had both a positive and a negative impact on library staff. For some, it has been a "dream come true," whereas for others, it has been "intimidating." Although it permits some flexibility in work arrangements by facilitating telework, it has also caused resentment among employees whose work does not allow them to take advantage of such arrangements. Also, some employees feel pressured to take extra work home because of the availability of ICT. Email has reduced FTF communication among library staff, and, on occasion, it has caused "miscommunication" and tension as tone can be ambiguous. The rapid pace of technology and the need to continually upgrade one's skills has divided staff members by accentuating differences in attitudes and skill levels.

The View from the Executive Office

The ED is a married woman with grown children. She has been with the library for over 20 years, and she has spent the last three years in her current

job. Prior to assuming her present position, she was Head of the Children's Library. While technology has greatly enhanced her work as a librarian, it has exacerbated her level of stress in its capacity as an office technology. The ED feels that ICT has contributed to her personal stress by increasing her perceived workload, intensifying work-life conflict, causing more frequent interruptions at work, increasing expectations of rapid response and turnaround time, and reducing FTF communication. The ED works long hours, evenings, and weekends. She feels compelled to take work home as ICT facilitates working off-site; however, this adds to her stress. Although the ED's husband is sympathetic, she nonetheless feels badly about the constraints that her work has imposed on their personal and social lives.

> *Maybe I'm constantly anxious because I always feel that I should be doing something all the time. I don't pick up the messages but I feel guilty that I didn't. I should be answering something, maybe because I can. Maybe I should do this thing at home on Sunday before I come in on Monday. But then I get very resentful and my stomach's churning all the time.*

Board members and other volunteers expect to receive more and more information electronically and rapidly, and staff members "are emailing all the time when they should be talking." Hence, both internal and external communication has become more "frustrating." The ED is very proud of the library and the community it serves; this fortifies her and helps to offset some of the stress and strain.

Professional Perspectives

The Head of Circulation is a married woman with dependent children. She has been with the library for 14 years, beginning as a library technician, and

assuming progressively senior responsibilities. She has been in her present position for the last 10 years. The Head spends most of her time at work on the computer, and, on the whole, feels that technology has improved her ability to do her job. On the other hand, ICT has also contributed to her personal stress by adding work, increasing interruptions, and exacerbating interpersonal communication. Also, library members expect more services more rapidly. The Head stated that email was "a big pain in the neck," as it creates more work; it also "interrupts everything you do and it destroys your train of thought." She feels that "communication between departments has worsened' as a result of the disinhibiting potential of email and because of differences in technological skills among employees. The Head felt that she had little control over the flow of her work as she provides a service to the public. The nature of the work helps to establish boundaries as she cannot perform her job outside of the workplace. She also felt that the library was a "human place to work" with a "commitment to family ... that fits very well with my lifestyle."

Clerical-Administrative Perceptions

The Accounting Clerk is a married woman with grown children. She has been with the library and in her present position for 12 years. Technology has primarily been a source of stress and frustration for the Clerk. She noted that "Technology is wonderful when it works, and, in terms of my job, technology has not worked." The Clerk is in charge of the library's membership system which includes a member database, automated billing, and accounts receivable; however, the existing software not only controls and dictates how work is carried

out, but also, it appears to be incompatible with the library's needs. The Clerk will sometimes take work home or go into the office on Sundays to catch up, but she did not feel that this was related to technology. Other than the frustration and time lost in dealing with inappropriate software, the Clerk felt that she had "pretty good control" as she was generally able to schedule her work and establish priorities by herself. She felt that email has led to some depersonalization in communication as "it takes out the human contact."

4.1.6 Philanthropy.

I think ... a lot of us feel that technology is a locomotive chasing us down a track. We're running as fast as we can, but, at some point, it's gonna run us over. It just has to because you can't keep running that fast.
- Executive Vice-President, "United Community Services"

United Community Services (UCS) is a centralized fund-raising and community service organization, raising and distributing over $40 million annually, and managing assets in excess of $200 million. UCS funds over 50 constituent agencies, public establishments, and programs that deliver services in the areas of education, employment, legal aid, health care, immigration, social welfare, and cultural endeavours. It also funds educational and humanitarian projects overseas. The community-based organizations supported by UCS are aimed at serving youth and young adults, families, seniors, immigrants, and disadvantaged citizens, including needy individuals and families. UCS fulfills its mandate by relying on thousands of volunteers to assist with fund-raising,

allocation of campaign proceeds, and service delivery. The Executive Vice-President, a Planning Associate, and a Secretary were interviewed for this study.

ICT Use

All UCS managers, professionals, and clerical workers use computers, email, Internet, and voice messaging. Managers and senior professionals use cell phones as well. According to all of the interviewees, technological competencies vary among employees. Clerical and administrative workers are among the most proficient. All of the interviewees also felt that they and their colleagues were not fully exploiting the technologies at their disposal. This was attributed to a lack of time to comprehensively study and explore all of the potential applications of available technology. Some employees also resisted change. Training is provided prior to the adoption of new equipment or software. UCS uses "power trainers," a type of train-the-trainer method whereby employees in different occupational groups receive extensive instruction and subsequently train their colleagues. UCS assesses the organizational competencies of its constituent agencies through an annual, qualitative budget review process; however, it does not measure its own performance, including ICT competencies. UCS is cognizant of the strategic need to address these issues, and it is planning to implement a quality assurance program in the near future. Although UCS has an annual performance review process, it does not have a career development program. The organization recently created a Task Force on Human Resources (HR) to develop more coherent HR strategies, with an emphasis on career development and retention.

UCS uses ICT for both internal and external communications. Last year the organization overhauled its accounting system, and it is now in the process of transforming its campaign database in order to better manage its extensive contacts and network of donors. A lot of written material, from minutes of meetings to newsletters, is circulated by email. UCS has created a number of new jobs as a result of ICT; for example, it set up an IT department four years ago.

ICT and Stress in the Workplace

ICT has had both a positive and a negative impact on UCS employees. It has improved employees' access to information, streamlined routine tasks, such as mass mailings, and facilitated communication with important stakeholders, such as donors. On the other hand, technology use has exacerbated stress by feeding an extant culture of hard work, long hours, and intensive involvement. As UCS has a fiduciary relationship with its donors, constituent organizations, and community, employees generally feel that their work is pre-eminent and requires a high level of performance. One employee observed that "Failure is not an option." The Executive Vice-President (VP) articulated three major sources of ICT-related stress in the organization: increased expectations of rapid response and turnaround time; depersonalized communication; and the need to continually upgrade individual and organizational competencies. Technological skills and interest vary among staff members, creating some division and frustration. For example, one employee suggested that he worked "in a building full of Luddites."

The View from the Executive Office

The Executive VP is a married man with dependent children. He has been with UCS for 15 years and has occupied his present position for the last six years. The Executive VP works very long hours, evenings, and weekends. He also travels extensively. Although technology has enabled him to be more efficient, and responsive, it has exacerbated his level of stress in many ways. First of all, he feels that his workload has increased tremendously, both in terms of the volume of information he receives and the demands made by others. Also, expectations have grown:

> *There's no way in the world you can be where you're not expected to be in communication ... I find it adds to the stress level, only because you're operating at a more frenzied level. You're moving through a lot of material. If you multiply the points of access and marry that to an expectation of rapid turnaround or rapid response, it's like juggling. How many balls can you juggle? How long can you keep juggling?*

The Executive VP spends at least three hours a day responding to email and voice messages. He often works late, takes work home, and begins early in the morning. Although he tries to "safeguard" some time in the evening to be with his young family, he generally feels "exhausted" by the time he gets home. The Executive VP felt that he had partial control over his workflow. Although frequent interruption and constant access had attenuated his ability to schedule and prioritize, he felt that he maintained some control over the management of his work by delegating some projects to other managers and supervisors, and by using assistants to screen routine communications and messages. The Executive VP had also hired a consultant to help him exploit email software more effectively. The Executive VP was concerned that ICT had reduced FTF communication, thereby compromising relationship building and interaction.

Finally, he felt that technology magnified the cognitive demands inherent in his role as CEO, exacerbating exhaustion and strain, and reducing engagement:

> *It's just that the volume has intensified, has increased so dramatically, and my ability to engage that volume is not commensurate with the volume that's coming my way. But I'm better for the volume in the sense that I know what's going on. I can dance faster so I'm dancing faster. But it's tiring. It's exhausting. And at some point there's got to be a diminishing return.*

Professional Perspectives

The Planning Associate is a single man with no children. He has been with UCS and in his present position for three years. The Associate feels that technology has greatly enhanced his work. "In certain areas, I find the technology just brilliant." For example, ICT has improved his ability to build relationships with donors, market ideas, and streamline routine correspondence. On the other hand, it has also added to his perceived workload, depersonalized communication, and deepened divisions among staff members. The Associate works long hours, evenings, and weekends. He described his workload as "almost unbearable," "mentally taxing," and "extremely, extremely draining;" he felt that ICT had exacerbated his workload by increasing demands and expectations:

> *When I started off, I was not being asked to, for example, develop PowerPoint presentations. Once I started to show that I had an affinity for that, then all of a sudden it changed and now I'm called on to do a lot of mega presentations ... It's stressful because all of a sudden, you're being asked to do a lot more, and you're put in a much more public type of position ... It's not power that I have, but we deal with a lot of pretty serious issues, and we deal with a lot of money.*

The Associate feels that he has limited control over the flow of his work although he is able to establish some priorities. The Associate believes that ICT has

accentuated differences among staff members by drawing attention to skill gaps; this, in turn, has created some conflict and division, particularly as some employees have embraced change and others have resisted. Electronic communication has also reduced human contact, leading to more formal and distant interaction.

Clerical-Administrative Perceptions

The Secretary is a single woman with no children. She has been with UCS and in her present position for 14 years. The Secretary felt that technology has improved her job by making her work more interesting, efficient, and diverse. On the other hand, it has also added to her perceived workload, depersonalized communication, and eroded teamwork among some of the secretarial staff. ICT has increased her workload by "inundating" her with email and voice messages. It has also introduced new cognitive demands. For example, it has created the expectation that secretaries can do graphic design work easily, rapidly, and frequently.

> *A lot of graphic design gets done at the secretary level, and it was never like that before. That puts a bigger demand on secretaries because it's not like computer skills you can learn. Everybody can learn the same skills. It's like a creative kind of skill that puts a demand on a secretary that personally I don't feel belongs there.*

Because she has extensive computer skills, the Secretary is also expected to train colleagues, which she enjoys. However, some of her colleagues appear to resent the changes introduced by ICT; this has increased isolation among the clerical staff in some departments, and it has lowered cooperation and collaboration. The Secretary also feels that electronic communication has

reduced the "personal touch" in external communications at times, thereby creating some distance with donors.

4.2 Cross Case Analysis

In this section, responses will be aggregated in order to provide greater insight and identify general tendencies.

ICT Use

All of the organizations use the technologies under study (see Table 4.1). All of the interviewees use computers, email, Internet, and voice messaging. Five out of six managers use cell phones, as do half of the professionals. None of the clerical-administrative workers use cell phones.

Three of the organizations, PEN, King, and UCS, have IT departments. In each of the other organizations, responsibility for IT has been added to the job of another staff person who has other primary responsibilities. At A-PAC, the Communications Officer coordinates the IT function; at Harbour Village, the responsibility has been assigned to the Controller; and at ASSIST, the Coordinator of Programs and Services manages IT projects.

Technology has necessitated or facilitated job creation in all of the organizations. First of all, the technology function itself has spawned new positions such as network administration. Second of all, technology has introduced new efficiencies, allowing the organizations in the study to eliminate some jobs and streamline others. This, in turn, has enabled the organizations to

Table 4.1 - ICT Use

	Cell Phone	Computer	Email	Internet	Voice Messaging
EA	√	√	√	√	√
PA	√	√	√	√	√
CA		√	√	√	√
EE		√	√	√	√
PE		√	√	√	√
CE		√	√	√	√
EH	√	√	√	√	√
PH	√	√	√	√	√
CH		√	√	√	√
EI	√	√	√	√	√
PI	√	√	√	√	√
CI		√	√	√	√
EL	√	√	√	√	√
PL		√	√	√	√
CL		√	√	√	√
EP	√	√	√	√	√
PP		√	√	√	√
CP		√	√	√	√

Legend:

EA=Executive Advocacy PA=Professional Advocacy CA=Clerical Advocacy
EE=Executive Education PE=Professional Education CE=Clerical Education
EH=Executive Housing PH=Professional Housing CH=Clerical Housing
EI=Executive Immigration PI=Professional Immigration CI=Clerical Immigration
EL=Executive Library PL=Professional Library CL=Clerical Library
EP=Executive Philanthropy PP=Professional Philanthropy CP=Clerical Philanthropy

create new jobs or to add new functions to existing positions without allocating additional resources. In four of the six organizations, redundant personnel were retrained and/or redeployed. In the other organizations, occupants of redundant positions were offered early retirement or severance packages.

All of the organizations use ICT for both internal and external communication. Most written material is distributed by email. All of the executives interviewed felt that their organizations were late adopters of technology. One executive suggested that NFPs were "reactive;" another noted that they were "not in the avant-garde;" and a third stated that they were "followers, not leaders." All executives, most professionals, and many clerical-administrative workers felt that they were not fully exploiting technology, organizationally or personally. The executives expressed concerns about the challenge of maintaining organizational and individual competencies in a rapidly changing technological world. One suggested that "technology management is the new time management."

Values

All but two of the interviewees felt that organizational values, particularly those values that were altruistic or otherwise oriented toward serving a community, were compatible with their personal values. The two who perceived values conflict felt that the goals and missions of their organizations were not reflected in day-to-day operations as their organizations were in transition or turmoil. Most of the interviewees felt that the missions of their organizations, and their personal contributions toward furthering those missions, were very meaningful and vital; consequently, they accepted environmental demands and

constraints with equanimity. Several volunteered that, from the start, they understood that they would not be occupying "9 to 5" jobs. On the other hand, one in three interviewees reported work-life conflict, suggesting some potential incongruity between certain abstract ideals of the organizations, such as their emphasis on compassion for others, and some of their actual HR practices, such as expecting individuals to work long hours and weekends on a regular basis.

Training

All of the interviewees have had some training or orientation in the use of ICT. The majority reported that they were self-taught or had acquired new skills on the job, learning from colleagues and supervisors. Most indicated that they would like to have additional training, preferably experiential, "hands-on" OJT. Time and budgetary constraints, along with competing demands, were barriers to training in most of the organizations. Insofar as classroom methods are concerned, courses and workshops that were proximal to technology adoption were considered more effective than training offered well in advance of technological change. Also, trainers who were familiar with the employees' work and work environment were invariably perceived to be more effective than those who were unfamiliar with these factors. When implementation lagged behind training, skill decay and relapse occurred. Two executives had received coaching from external consultants in order to acquire and develop strategies to exploit ICT more effectively. Clerical-administrative workers had received more training than employees in other occupational groups.

Workload

Executives. All of the executives felt that ICT had increased their perceived workload and hours of work by creating additional demands and expectations. Five of the six executives also felt that technology blurred the boundaries between work and home life. All reported information overload as well as increased expectations regarding the quality and quantity of documents and other informational material that could be produced. The more experienced executives delegated as many tasks and responsibilities as they could in order to make their perceived workloads more manageable. Nonetheless, all of them expressed the concern that having to process and act on huge amounts of information was mentally taxing, leaving little time for reflection. One suggested that:

> *The stresses are the stresses we began to talk about, about the expectation that things are always in touch. There are too many points of entry: email, voice mail, mail, faxes, meetings, visits. How much input can one absorb, digest, assimilate, and not choke on?*

Professionals. All of the professionals interviewed reported heavy workloads. Five of the six professionals felt that ICT had exacerbated their perceived workloads by raising expectations about what could be accomplished with the assistance of computer software and Internet access. One professional felt that overload was driven by organizational exigencies and not influenced by technology. Dealing with a steady stream of email correspondence and voice messaging also added to the workloads of the professionals interviewed. However, perception of load effects varied. For example, one professional felt that 5-10 emails a day was a "nuisance" while another considered 50-60 emails to be manageable. Four of the six professionals felt that technology aggravated

work-life conflict by facilitating their ability to work off-site and outside of regular working hours. All of the professionals interviewed had limited access to clerical support due to the availability of ICT. This had added to their perceived workloads and led to some deskilling.

Clerical-Administrative Workers. All of the clerical and administrative workers interviewed felt that technology both streamlined and increased their workloads. On the one hand, technology had reduced the number of routine, repetitive tasks that they were required to perform, such as filing; on the other hand, new demands and responsibilities, such as graphic design work, had been incorporated into many of their jobs. All of the clerical workers found their work more interesting as a result of technology. They also felt that their jobs had been upgraded. One secretary suggested that upgrading could be stressful at times as the increased cognitive demands associated with new responsibilities, such as design work, were not always consistent with clerical workers' skills or aptitudes. Half of the clerical workers felt that their workloads had increased as there were fewer of them available to support the work of managers and professionals.

Control

Executives. Five of the executives felt that ICT had reduced the amount of control and discretion that they had in their work by making them more accessible to others and by multiplying expectations of constant availability, rapid response, and quick turnaround time. In all cases, ICT exacerbated the number of interruptions they experienced; hence, it lowered their ability to organize and prioritize their work. Five of the executives felt that diminished control had made

their work more stressful, particularly when expectations were perceived to be unreasonable. They likened the impact of ICT on control to "being hammered all day," or having "bullets shooting at you from a lot of different places." The more experienced executives used gatekeeping strategies, such as having their calls, email, and voice messages screened, to cushion the impact as much as possible. However, they all felt that ICT had made it more difficult to avoid dealing with "intrusions," acknowledging and acting on requests, and providing immediate feedback. Four of the executives suggested that many of these concerns were relevant to their subordinates as well. One said, "I think people are much happier if they have control over their workload and their environment."

Professionals. All of the professionals felt that ICT diminished controllability by increasing expectations of immediate response and rapid turnaround time, and by multiplying the frequency of interruptions they experienced. Perceived control was weaker among professionals with supervisory or coordinating responsibilities. Half of the professionals also felt that the pressure to respond immediately or rapidly to requests increased the likelihood of error; this, in turn, created additional feelings of anxiety. Furthermore, the pressure to respond quickly increased the probability of sending emotional, ill-conceived messages. Equipment breakdowns also reduced perceived control for some professionals.

Clerical-Administrative Workers. Conflicting demands, equipment failure, and expectations of rapid turnaround time lowered perceptions of control among all clerical-administrative workers. Meeting the needs of an increasing number of

professionals and managers was a major source of tension for most of the clerical workers interviewed. This was exacerbated by an increase in the amount of work they were expected to execute at the last minute due to perceptions that technology enabled them to complete many tasks quickly or even instantaneously. Half of the clerical workers also felt that control was diminished when technology dictated the ways in which they had to organize and fulfill their duties, as was the case with some database management and accounting programs.

Community

Executives. All of the executives felt that ICT, particularly email, had led to some depersonalization of communication, which, in turn, promoted increased isolation and a reduced sense of affiliation. All of the executives noted that direct, personal contact was very important in the NFP sector as their work revolved around human interaction, regardless of whether they were delivering services or representing the interests of others. Five of the executives expressed a preference for FTF communication, followed by telephone interaction, and all of them felt that the growing use of email had led to increased tension in interpersonal relationships, especially when email was used to address sensitive issues. In these instances, tension derived from ambiguity in tone and from disinhibition leading to flaming. Most of the executives noted that FTF communication facilitated relationship building, and they expressed concerns that electronic communication had compromised their ability to do so, particularly with external contacts and peers. Half of the executives also felt that technological

skill gaps among employees had fostered divisions and fomented conflict at times. While these issues were of concern to them from an organizational perspective, executives also felt that such matters had contributed to their personal stress. Some characterized differences between "the old guard' and those who were technologically "savvy" as a clash of cultures.

Professionals. Five of the six professionals interviewed felt that ICT, particularly email, had made interaction more impersonal. One felt that the informal character of email facilitated relationship building. Half of the professionals felt that ICT had created or accentuated divisions among staff members by highlighting skill disparities or attitudinal differences toward technological change. As a result, communication and collaboration had deteriorated in some workplaces or departments. Many professionals also felt that email communication created conflict and tension as people tended to be more provocative in this medium than in FTF or telephone communications. Most of the professionals observed that human interaction was critical in the context of their work, and they expressed concern about the isolating and depersonalizing effects of ICT.

Clerical-Administrative Workers. Half of the clerical workers felt that ICT, particularly email, had increased perceived isolation by removing the "personal touch" from interaction whereas the other half felt that email had brought them and their colleagues together by facilitating frequent communication. All of them noted that flaming and ambiguity could also create conflict. Several clerical

workers felt that ICT reduced cooperation and generated ill feelings when skill differences among staff were pronounced.

ICT and Job Stress

As shown in Table 4.2, all but one of the 18 interviewees reported stress reactions linked to the impact of ICT on their perceived workload, perceived control, and perceptions of community breakdown. Nearly 80 per cent felt increased pressure related to ICT demands, and over 60 per cent experienced feelings of anxiety. Half of the interviewees reported fatigue, and at times, exhaustion, related to ICT demands, and over 25 per cent experienced headaches and eyestrain. A few interviewees had trouble sleeping, and others had stomach problems. Two interviewees reported that they had been treated, in the last year, for anxiety and burnout stemming from work overload related to technology demands. On the whole, executives reported the highest number of stress reactions while clerical-administrative workers reported the lowest number of stress reactions. Female managers and professionals reported slightly higher stress reactions than their male counterparts. Family status and tenure did not appear to influence stress reactions. However, more than 75 per cent of the interviewees had no children or grown children, and all employees had been with their respective organizations for fewer than five years, or more than 12 years (see Appendix A).

Table 4.2 – ICT-Stress Reactions

	Feel more anxious	Feel more pressure	Fatigue, Exhaustion	Trouble sleeping	Upset stomach	Headache, Eyestrain	Took medication
EA		x		x			
PA	x	x	x		x		
CA	x					x	
EE		x					
PE		x					
CE		x	x			x	
EH	x	x	x				x
PH		x		x			
CH							
EI	x	x	x			x	
PI	x	x	x			x	x
CI	x		x			x	
EL	x	x			x		
PL	x	x					
CL	x	x					
EP	x	x	x				
PP		x	x				
CP	x		x				

Legend:

EA=Executive Advocacy   PA=Professional Advocacy   CA=Clerical Advocacy
EE=Executive Education   PE=Professional Education   CE=Clerical Education
EH=Executive Housing   PH=Professional Housing   CH=Clerical Housing
EI=Executive Immigration   PI=Professional Immigration   CI=Clerical Immigration
EL=Executive Library   PL=Professional Library   CL=Clerical Library
EP=Executive Philanthropy   PP=Professional Philanthropy   CP=Clerical Philanthropy

Chapter Five – Discussion and Conclusion

*Life's ok – but the hours! 24 hours a day, 7 days a week, 365 days a year
... it never stops!*
- As heard on Q-104 FM, "The Drive Home"

*You are not obligated to complete the work, but neither are you excused
from it.*
- Talmud

5.1 Key Findings and Revised Model

The data collected in this study clearly supported the central proposition
that ICT contributes to job stress by exacerbating workload, reducing control, and
disrupting community ties at work. Employees in all occupational groups in the
observed NFP organizations reported increased stress and strain related to the
adoption of ICT. New expectations associated with technology diffusion emerged
as an important aspect of work overload and reduced control associated with ICT
use. It was also found that values conditioned the manner and the degree to
which new technologies influenced the mediating variables. For example, a
strong work ethic and a belief in the importance of the mission of the organization
encouraged many employees to view overload as an inevitable component of
their work, and, consequently, to think of ICT as a tool enabling them to handle
more supplementary, unpaid work. Training offered salutary benefits in some
cases, but its impact varied. Also, the absence of training was not necessarily
associated with either positive or negative outcomes. Training may, in fact, act as
a hygiene factor (Herzberg, 1968); it does not necessarily motivate workers to
embrace and maximize technology, but it may help attenuate or eliminate some
negative outcomes, such as stress associated with skill deficiencies.

Expectations, Workload, and Control. Changed or new expectations emerged as a particularly salient aspect of both workload and control, contributing significantly to the way in which stress is perceived and experienced across occupational groups. Expectations that more work could be done as a result of new technologies created new demands, both actual and perceived. For example, all of the employees interviewed are now required to provide much more information and documentation to their funding agencies and board members than they did prior to the universal availability of personal computers and Internet access in the workplace. When stakeholders include government bodies, as is the case in the organizations dealing with education, immigration, and housing, reporting obligations are multiplied. In addition, there are expectations that the quality of the material produced will be better in terms of content, format, and style. Other workload demands included progressively increasing expectations that ICT facilitated multitasking; hence, many employees felt pressured to undertake and complete several activities, tasks, and/or projects simultaneously. Although many reported that they enjoyed multitasking, the majority found it overwhelming at the same time. The inherent variety in multitasking may be positive while the associated cognitive demands and time pressures may have adverse consequences. Multiple requirements may also create conflicting demands; that people react negatively to ambiguous roles (Kahn et al., 1964) is virtually axiomatic.

ICT also exacerbated workload by reducing available clerical and administrative support. This was especially salient among professionals and

CEOs of smaller organizations. One manager wryly observed that "individuals have become their own secretaries." The expectation that communication technologies and software will effectively substitute for clerical support by allowing employees to easily process correspondence, documents, and textual material, permitted all of the organizations to redeploy, retrain, or lay off some support staff with a view to exploiting limited resources more efficiently. In some cases, real efficiencies were achieved, either in terms of cost savings or in terms of increasing staff complements in more critical areas in order to improve overall organizational effectiveness. In other cases, however, these changes added heavily to the workloads of professionals and managers, potentially offsetting other gains. For example, if managers are required to spend many hours typing reports and formatting documents, the time available for other, perhaps more compelling activities, such as planning and problem-solving, may be reduced. Adding an inordinate amount of clerical work to professional and managerial jobs may also lead to some deskilling and reduced job satisfaction. Upgrading clerical jobs and redeploying clerical staff elicited mixed reactions from clerical workers as well. Whereas the majority enjoyed taking on new challenges, some were uncomfortable with the concomitant increased cognitive demands.

ICT-induced expectations such as immediate response and rapid turnaround time clearly created additional time pressures and lowered feelings of perceived control. Many employees reported feelings of anxiety and frustration due to the perceived obligation to respond immediately to email and voice communications, regardless of where they were or what they were doing.

Managers, whose work already tends to be characterized by frequent interruption (Mintzberg, 1999), found the disruptive nature of ICT particularly annoying and counterproductive. Keeping up with the pace of change also created cognitive demands and lowered perceived control.

Community. The expectation that electronic media can increasingly replace FTF communication has exacerbated feelings of depersonalization and isolation leading to some breakdown of community. Although email and voice messaging systems have allowed for more rapid, and, sometimes, more frequent communication, many employees suggested that communication has become more impersonal as a result of decreased FTF communication; hence, they felt increasingly isolated. This was of particular concern to employees in social service agencies, where environments tend to be "high touch" as opposed to "high tech" (Daft, 1995). Although some employees felt that email facilitated communication, many noted that it also contributed to ambiguity; furthermore, its impersonal, disinhibiting character created conflict at times. The growing use of email to address, or, perhaps, avoid dealing with sensitive issues appeared to be an emerging concern.

Values and Culture. Surprisingly, work-life conflict did not appear to be significantly exacerbated by technology for most workers. Rather, technology seemed to complement a pre-existing pattern of working long hours. Although nearly all employees reported high levels of unpaid overtime, both at the office and at home, long hours and unpaid supplementary work at home seemed to be driven more by shared values than by the availability of technology. A strong

work ethic and belief in the vital and altruistic nature of the work itself prevailed across all organizations sampled. It is also possible that values, which can be defined as a dimension of organizational culture, may not fully explain the hypothesized relationships. Testing the broader construct of organizational culture, which incorporates both shared values and norms (O'Reilly & Chatman, 1996), may be more fruitful.

Although values did condition the ways in which ICT influenced workload, control, and community, this was not expressed in terms of match or mismatch, as is the case in the Maslach and Leiter burnout framework (Maslach & Leiter, 1997; Maslach et al., 2001). Rather, pre-existing organizational norms and beliefs seemed to influence the ways in which ICT was perceived, implemented, managed, and exploited. There was little evidence of values conflict within the observed organizations. On the other hand, there was much evidence of shared values. To the extent that individuals may self-select (Wanous, 1978) into organizations, due, in part, to their perception of its culture (Schein, 1978), values congruence may be high in NFPs as most employees believe that their work is meaningful and contributes to a greater good. As one manager reported, "We all feel that ... when we get out of bed in the morning ... something good is gonna come out of what we do by the end of the day."

Training. The timing of training was found to be critical to effective transfer of training. For example, training offered long in advance of the introduction of a new technology was virtually futile, and, occasionally, counterproductive, as employees resented both the time wasted and the subsequent expectations that

they had attained the necessary competencies. Training in advance of adoption was only effective if provided around the time of implementation.

In their review of the literature on technological advances in Canada, Methot and Phillips-Grant (1998) underlined the importance of transfer issues in training, and observed that transfer appeared to be difficult to achieve. Timing and follow-up may explain some of these problems. For example, large organizations implementing system-wide innovations may be obligated to begin training well in advance of implementation. If cognitive demands are high, relapse may occur by the time workers have had an opportunity to use the new technology. Furthermore, follow-up training and evaluation of training are frequently neglected. As cognitive demands associated with technologies appear to be ongoing, follow-up training may be particularly relevant. Training can also enhance efficacy beliefs (Gist, 1989).

Job Burnout and Turnover. Several participants reported some of the symptoms associated with burnout, particularly exhaustion. Managers reporting symptoms of burnout felt overwhelmed by information overload, expectations of rapid response and turnaround, and the perceived need to be constantly accessible by cell phone and email. Interestingly, all participants in the study had fewer than five or more than 12 years of experience, suggesting that younger workers are leaving; consequently, turnover and retention may be emergent, growing issues. As job burnout tends to be more widespread among employees under 30 (Maslach et al., 2001), it is possible that younger people are leaving as a consequence of the increasingly high job demands and shrinking resources

that exist in NFP organizations. Long-tenured workers may be more reluctant to leave for a variety of reasons. For example, they may be more heavily invested in their work or in maintaining benefits that they have accumulated. As well, they may have acquired coping strategies over the years.

Impact on Managers. In this study, ICT-related stress was most salient among managers. This is an important finding, particularly in view of the fact that managers are among the least studied occupational groups in the context of ICT-related stress. Whereas the introduction of personal computing technology, particularly word processing, had more of an initial impact on clerical-administrative workers, electronic and wireless communications may be having more of an impact on managers. More research is needed to examine the prevalence and consequences of these issues.

Creativity. A very interesting finding that emerged inductively, from the data, is the notion that ICT may constrain creativity by reducing time available for reflection. This was most salient among managers, and, to a lesser extent, among professionals. Although technology adoption has been clearly linked to organizational innovation and productivity gains (Baldwin, 1999), individual employees felt that the continuous obligation to deal with new quantitative demands, such as digesting voluminous amounts of information and negotiating hundreds of email and voice messages daily, left little time for creative thinking, planning, and problem-solving. Clearly this could have important consequences, for both the individual and the organization, and it merits further study. For example, whereas creativity tends be defined as an individual construct, it may

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also be an important prerequisite for organizational innovation (Amabile, Conti, Coon, Lazenby, & Herron, 1996) and innovative problem-solving (Mumford & Gustafson,1988).

Revised Model. This paper introduced a conceptual framework to explore and test the impact of ICT on job stress and burnout in its capacity as a general purpose technology. The results of the present study suggest that ICT contributes to job stress across occupational groups and organizations in the NFP sector by generating new demands and expectations that exacerbate workload, control, and community breakdown. The research also suggests that ICT impact is partially driven by the characteristics of the technologies, but it is significantly determined by organizational context and environment, particularly shared values and culture.

The proposed theoretical model was revised and elaborated based on the results of the data collection (see Figure 5.1). The revised model incorporates an expectations variable, suggesting that ICT contributes to increased job stress by generating a new set of expectations that exacerbate work overload and perceived control. The model also includes a more comprehensive description of the other variables, based on an integration of the literature and the results of the data collection.

Figure 5.1 – Revised ICT-Stress Model
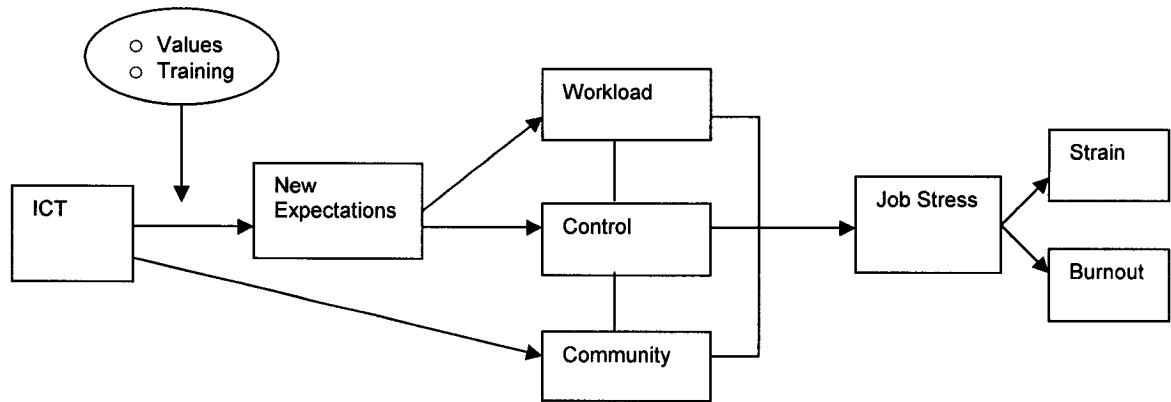
ICT
- cell phones
- computers
- email
- Internet
- voice messaging

Expectations
- more work can be done
- multitasking possible
- better quality work
- immediate response
- rapid turnaround time
- constant accessibility

Values
- shared
- determine ICT impact

Training
- increased efficacy

Workload
- too much work
- work too difficult
- work at home

Control
- reduced decision latitude
- turbulent working conditions
- role conflict and ambiguity

Community
- depersonalization
- increased isolation
- interpersonal conflict

Job Stress
- increased demands
- inadequate resources

Strain
- more feelings of anxiety
- more feelings of pressure
- fatigue
- sleep disturbances
- somatic complaints

Burnout
- exhaustion
- inefficacy

5.2 Research Propositions – Expanding Our Understanding

As noted in the preceding analysis, the data collected in this study supported the central proposition that ICT contributes to job stress by exacerbating actual and perceived demands associated with workload, by lowering actual and perceived control, and by disrupting community ties at work. In addition, a number of robust findings related to the hypothesized relationships between and among variables emerged inductively from the data. Furthermore, some compelling differences between and among occupational levels were observed. Hence a list of testable propositions is offered here to help guide further study.

Propositions about expectations and workload. The present research found that new expectations associated with the diffusion of ICT in the workplace mediated the relationship between technology use and workload. Increased, and, at times, unrealistic or superfluous reporting obligations, information processing requirements, production of documents, and multitasking were attributed to expectations that the quality and quantity of work done could easily be augmented as a result of ICT. Consequently, the widespread perception that ICT use generated more work contributed to the ways in which stress and strain were seen and experienced across occupational groups.

Proposition 1a: Expectations that more work can be done as a result of ICT contribute to work overload by increasing quantitative and qualitative demands. Expectations may stem from supervisors, colleagues, and/or clients, as well as both internal and external stakeholders.

Proposition 1b: Expectations that more work can be done as a result of ICT contribute to job stress and strain by exacerbating perceptions of work overload, both real and perceived.

Proposition 2a: Expectations of multitasking capabilities contribute to workload by increasing quantitative work demands.

Proposition 2b: Expectations of multitasking capabilities contribute to job stress and strain by (a) exacerbating perceived workload, and (b) creating conflicting demands.

The expectation that telecommunications technology and computer software could replace some clerical and secretarial functions led to a reduction in support staff through attrition, layoffs, and/or redeployment of staff in most of the organizations studied. Decreased clerical support added to the workloads of many managers and professionals, and, at times, contributed to perceptions of deskilling and reduced job satisfaction among workers at these occupational levels. Reactions among clerical staff to upgrading and redeployment were ambivalent. Whereas most workers appreciated the increased variety and new challenges associated with upgraded jobs, others found new cognitive demands to be a source of ongoing stress and strain.

Proposition 3a: Reduced clerical support associated with ICT diffusion increases the real and perceived workload of managers and professionals.

Proposition 3b: Adding a clerical component to managerial and professional jobs can lead to deskilling and reduced job satisfaction.

Proposition 4: Clerical workers perceive job upgrading both positively and negatively. Upgrading enhances job satisfaction and motivation among most clerical workers. Increased cognitive demands contribute to stress and strain among some clerical workers.

Propositions about expectations and control. Universal access to email, voice communication technologies, and Internet created expectations of quick response and turnaround time. As a result of these increased time pressures, many employees felt that they had less control over their work; consequently, they reported increased strain, particularly feelings of anxiety. These perceptions were particularly salient among managers and professionals. In addition, many managers and professionals felt that telecommunications technology rendered them more accessible to others. This increased accessibility contributed to blurring the boundaries between work and non-work activities. Enhanced accessibility also increased the already large number of interruptions that characterized managerial work; hence, many managers perceived that their work environment had become more chaotic. A few managers used or adapted traditional gatekeeping strategies such as having telephone calls, emails, and voice messages screened in an attempt to manage accessibility and control interruptions.

Proposition 5a: Expectations of immediate response and rapid turnaround time, related to the universal availability of telecommunications technology, lower perceptions of control, and lead to increased strain, particularly feelings of anxiety.

Proposition 5b: Managers and professionals experience higher levels of stress and strain associated with expectations of quick response and turnaround time.

Proposition 6a: Expectations of constant accessibility blur the boundaries between work and non-work activities, resulting in increased stress and strain, particularly among managers and professionals.

Proposition 6b: The use of gatekeeping strategies to limit accessibility and manage interruptions moderates the experience of reduced control and increased strain.

Propositions about ICT and community. Lean media, such as email and voice messaging, have increasingly replaced richer media, such as FTF communication, in the organizations studied. This has led to growing perceptions of isolation and depersonalization. While many workers reported that the use of lean, asynchronous media, such as email, effectively facilitated more frequent, routine communication, they felt that the growing use of lean media to address complex communications exacerbated ambiguity, increasing the potential for miscommunication. Equivocality, in turn, contributed to strained communications, and, at times, fomented interpersonal conflict. As electronic communications evolve, a new hierarchy of information and media richness may be needed to ensure that medium selection is compatible with communication task demands. Time pressures and other contextual factors may also influence media choices.

Proposition 7: Reduced FTF communication exacerbates perceived isolation and feelings of depersonalization.

Proposition 8a: The use of media low in richness, such as email, for complex communication tasks and sensitive interaction leads to increased ambiguity, which, in turn, adds to job stress.

Proposition 8b: The use of lean media, such as email, for complex communication tasks and sensitive interaction leads to increased interpersonal conflict, which, in turn, exacerbates job stress and strain.

Propositions about ICT, job stress, and organizational culture. The prevalence of a strong work ethic, a belief in the importance of the work of the organization, and a congruence of values attenuated the stress and strain associated with ICT, particularly those related to perceptions of work-life conflict.

Proposition 9a: Pre-existing norms, beliefs, and shared values influence the ways in which ICT is perceived, implemented, and utilized in the workplace.

Proposition 9b: Shared values may attenuate the stress and strain associated with ICT use, particularly those related to work-life conflict.

Propositions about ICT, job stress, and training. Although training offered salutary benefits in some cases, its absence was not necessarily associated with negative outcomes. The timing of training influenced its effectiveness, particularly in terms of acquiring and maintaining new competencies. Training may also enhance efficacy beliefs, mitigating the stress and strain associated with increased cognitive demands.

Proposition 10: Training offered at or around implementation of new technologies is more effective than training offered in advance or subsequent to implementation.

Proposition 11: Training enhances efficacy beliefs by attenuating perceived cognitive demands and skill gaps associated with ICT diffusion.

Propositions about ICT, burnout, and creativity. In this study, burnout was treated as a response to chronic stress. Some evidence of burnout related to ongoing technology stress was found, particularly among managers .and professionals. In addition, some managers felt that the overwhelming and time-consuming nature of information overload and increased time pressures reduced time available for creative work and reflection.

Proposition 12a: Chronic, ongoing perceptions of information overload, rapid response and turnaround requirements, and constant accessibility contribute to experiences of burnout, particularly exhaustion among managers and professionals.

Proposition 12b: Information overload and rapid turnaround expectations may constrain managerial creativity, creative planning, and creative problem-solving by reducing time available for reflection.

5.3 Directions for Future Research

The study found that ICT contributed to job stress by creating new expectations that exacerbate workload, control, and community factors. A conceptual framework was developed and tested using a stratified sample in a non-traditional sector of study, the NFP. Given the robust findings of the present research, qualitative case studies in other sectors should be undertaken to assess the ways in which ICT contributes to job stress in other settings. Future

studies could also incorporate both qualitative and quantitative data. Drawing on a combination of qualitative and quantitative data may strengthen future findings (Eisenhardt, 1989; Mintzberg, 1979; Yin, 1994, 2003). For example, collecting records of ICT use, such as email logs, time spent on the Internet, and phone calls and messages received, over a period of time, could help to verify and validate self-report data, adding confidence to our conclusions. Longitudinal research is also needed to observe effects over time as technology keeps changing, and workers are continually adapting to new paradigms.

This study examined several occupational groups and levels, as opposed to single ones, and found that managers, an understudied group in the context of ICT-related stress, experienced high levels of strain associated with technology use. This has potentially serious implications and merits further study. It also underscores the need to broaden the scope of ICT-related stress research which has traditionally focused on clerical and technical workers.

The present research yielded a rich theoretical model, with comprehensively defined constructs that could be further tested using multiple methods, including quantitative surveys. Subsets of the model, using a smaller number of variables, could also be used in future studies.

The results of the data collection additionally suggested that some workers were able to cope more effectively with ICT-related stress than others. Although this study did not include coping styles and strategies, they may offer insight into the management of ICT and job stress. Similarly, personal dispositions may help us to better understand the stress-strain relationship

associated with technology use. For example, load effects varied considerably in this study.

A paucity of studies at the individual level has created both methodological and practical problems in the study of ICT. Studies at the group and organizational levels have inferred individual attributions, and some group level ICT research has used individual level theories and measures to make group level inferences. However, not all phenomena are isomorphic across levels of analysis (House, Rousseau, & Thomas-Hunt, 1995). Therefore, drawing conclusions based on research at one level, and making inferences at another, increases our potential for error (Mossholder & Bedian, 1983).

Multilevel theories may be particularly well-suited to studying the impact of ICT as a relationship between the individual and the organization appears to be important. For example, individual stress and strain may have organizational outcomes with respect to performance, productivity, and withdrawal behaviours. When organizational constructs can be effectively conceptualized in more than one way, they offer richer analyses (Klein, Dansereau, & Hall, 1994).

5.4 Implications for Management Practices

Several practical recommendations may be gleaned from this research. These recommendations apply to the sector and types of organizations studied, and they are not necessarily generalizable to other sectors or types of organizations. Practical recommendations may be summarized as follows:

- Organizations should promote and maintain the development of a learning culture to support ongoing technological change and to attenuate conflict and other problems associated with skill gaps among employees;

- Technological competencies should be identified and tied to human resource processes including recruitment, selection, performance evaluation, and training;

- Existing technological capabilities should be exploited more fully in order to streamline workloads, both on an organizational and individual level. For example, email software can be used to screen and sort messages in various ways; this can facilitate review and prioritizing, and reduce the impact of information overload.

- When implementing new technologies or introducing changes, training should be scheduled as close as possible to implementation time in order to maximize effectiveness and reduce strain associated with meeting new cognitive demands.

- OJT should be used as an ongoing strategy to prevent skill decay and relapse.

- Computer-based training (CBT) methods may be particularly effective as they permit work to be individually paced and scheduled. This is especially advantageous when time constraints are high. Using CBT methods has the additional advantage of enhancing comfort levels with technology;

- Coaching should be provided to help managers and executives develop individual strategies to streamline their work;

- An adequate support staff complement should be maintained to avoid deskilling and overloading of professionals and middle managers. Some clerical workers also felt overloaded as they were required to assist a growing number of professionals;

- Individuals should set aside specific times of day to review email and voice messages as opposed to monitoring communications continuously.

- Gatekeeping strategies should be used and adapted to avoid being overwhelmed by technology. For example, managers can have their emails and voice messages screened to reduce overload;

- Although some managers and professionals in this sector may feel that they must be accessible at all times, this responsibility can be shared among staff members, or delegated from time to time in order to reduce work-life conflict and promote balance.

5.5 Limitations

Although every effort was made to ensure that this research was conducted in a rigorous, systematic manner, it nevertheless has several limitations. The principal limitation of this study is that it was conducted by a sole investigator. Using multiple interviewers to collect, code, and analyze data helps to reduce researcher bias. As the use of multiple researchers is not a viable option in thesis research, other steps were taken to minimize bias. First of all, data were collected from multiple sources to permit triangulation. In addition, a case study base was created to enhance reliability. Maintaining a comprehensive

case study base allows other researchers to audit the case, or to conduct their own analysis of the data, and it additionally increases the likelihood that the same conclusions will be reached. The use of a semi-structured interview protocol permitted the inclusion of standardized questions and procedures to enhance construct validity and permit cross-site comparison. Interviews were also taped and transcribed to facilitate comprehensive, iterative analysis and coding.

Another potential limitation was the possibility of social desirability bias. As the interviewer was known to the participants and their communities, and as some interview questions were sensitive, the danger was considered to be high. Efforts were made to attenuate this threat by maintaining control of all interviews and by using a variety of effective interviewing techniques in order to create a productive environment and to promote candour.

5.6 Concluding Remarks

My eleven year-old son recently stumbled into a somewhat unsophisticated adult conversation on the origins of generational monikers. As we deconstructed the meanings of the Lost Generation, Baby Boomers, and Generation X, he howled with laughter. In a feeble attempt to get even, we asked him what name might be suitable for his own up-and-coming generation. Without a moment's hesitation, he replied, "The Technology Generation. You know, we're kind of techno kids, techie teens, and, I guess, when we grow up, they can call us Generation T."

In a relatively short time, ICT has become embedded in our daily lives. Change has occurred so rapidly and thoroughly that it can be hard to track, let alone fully comprehend. While ICT has offered tremendous resources that have enhanced our lives at home and at work, it has also contributed to increased job stress and burnout by generating unrealistic expectations of how much work we can or should accomplish in a given period of time, how that work is to be performed, and how we might interact with one another in the course of completing the work. Increasingly, the technology literature is adopting a social constructionist perspective, advancing the intuitively appealing proposition that the extent to which we are influenced by technology depends more on shared values and beliefs than on technical capabilities. Or, at least, it involves a combination of factors.

The research presented in this paper integrated various streams of literature to develop a model to help us better understand the ways in which ICT-related stress affects us individually at work. Understanding is also the first step toward harnessing the potential benefits we can derive and alleviating the strain. Hopefully, by the time Generation T'ers navigate the challenges of their era, they will have the tools, the skills, and the wisdom they need to chart their own course, and to journey forward.

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Appendix A – Demographic Information on Participants

CEOs

	Advocacy	Education	Housing	Immigration	Library	Philanthropy
Job	Executive Director	Executive Director	Executive Director	Executive Director	Executive Director	Executive Vice-President
Tenure	4.5	17	4	1	20	15
Gender	Male	Male	Female	Female	Female	Male
Family Type	Married, dependent children	Married, grown children	Single, no children	Single, no children	Married, grown children	Married, dependent children
Age Group	36-45	55+	36-45	46-55	55+	46-55

Professionals

	Advocacy	Education	Housing	Immigration	Library	Philanthropy
Job	Communications Officer	Assistant Director	Controller	Coordinator Programs and Services	Head of Circulation	Planning Associate
Tenure	4	2.5	14	7 months	14	3
Gender	Female	Female	Male	Male	Female	Male
Family Type	Single, no children	Married, dependent children	Married, dependent children	Single, no children	Married, children	Single, no children
Age Group	26-35	36-45	46-55	26-35	36-45	26-35

Clerical and Administrative Staff

	Advocacy	Education	Housing	Immigration	Library	Philanthropy
Job	Executive Assistant	Senior Secretary	Program Coordinator	Executive Assistant	Accounting clerk	Secretary
Tenure	21	23	3	36	12	14
Gender	Female	Female	Female	Female	Female	Female
Family type	Married, no children	Married, grown children	Married, dependent children	Divorced, grown children	Married, grown children	Single, no children
Age Group	46-55	55+	36-45	55+	36-45	26-35

Appendix B - Interview Guide

Name:
Organization: *Tenure:*
Position/Title: *Years in Position:*
Occupation: *Years in Occupation:*
Age: *Date of Interview:*

Part One: Background Information (CEOs only)

The purpose of this section is to gather general information about each organization, particularly an overview of technology use and its global impact. Background and contextual information regarding the adoption and diffusion of information and communication technologies is collected, and key issues, including human resource issues, are explored.

1) a. Which information and communication technologies (ICTs) does your organization use? How are they used?

   b. How long have you been using these technologies?

2) a. Approximately what percentage of staff in your organization uses ICTs? How?

   b. Approximately what percentage has the skills needed to use new technologies?

3) a. How have new technologies been integrated into the organization? How effective has this process been?

   b. Has any training or orientation been provided? If so, please describe the training provided.

   c. How effective was the training?

4) a. Has ICT caused or facilitated any organizational changes? If so, what changes have taken place? How effective have these changes been?

   b. Have you reorganized or restructured since the introduction of ICT?

   c. Have any jobs been created or eliminated? If so, what types? Why?

5) a. Does your organization have a career development program? Is it based on developing competencies?

   b. Are there processes in place to measure organizational capabilities and competencies?

   c. Are there are processes in place to assess technological capabilities and competencies?

6) a. How would you describe the overall impact of ICT on your organization?

   b. How would you describe the impact of ICT on your staff? Has it changed the way people work or communicate?

7) Does ICT support your mission or mandate? If yes, how?

Part Two: ICT Interview Questions (All Participants)

This section of the interview explores workers' perceptions of all variables in the proposed ICT-Job Stress model as well as the hypothesized relationships between and among variables. Questions are framed neutrally or both positively and negatively to avoid influencing the interviewee and to test rival hypotheses. Some variables are tested repeatedly to enhance reliability.

1) a. Which of the following information and communications technologies (ICTs) do you personally use?

   ____ email ____ cell phones ____computers ____ Internet ____voice messaging

   b. How long have you been using these technologies?

   c. How often do you use each of these technologies?

2) How do you use each of these technologies in your work?

3) a. Approximately how many emails do you receive daily? How many require a response?

   b. How do you feel about the quantity of email you process in a day?

   c. How much time do you spend on your email?

4) a. Approximately how many voice messages do you receive daily? How many require a response?

   b. How do you feel about the number of voice messages you get in a day?

   b. How much time do you spend on your voice mail?

5) What are the advantages and disadvantages of using electronic communications in your work?

6) a. What is the quality of the available equipment and software that you use?

   b. Do they allow you to complete your work on time?

7) a. Has your job changed in any way as a result of new technologies? Has it become easier, more difficult, or stayed the same?

   b. Have you had to learn any new skills? If so, how were they acquired?

   c. Do you require fewer skills to do your job as a result of new technologies? If so, please give examples.

   d. Have new technologies helped you do your job better or made things worse in any ways? How?

8) a. Have technologies created any new demands at work? Have they brought additional resources? Please be specific.

   b. Have these changes affected the quality of your work life? How?

9) a. How would you describe your current workload? How reasonable is it? How do you manage to get things done in a typical day?

b. Have new technologies affected your workload? Has your workload increased or decreased in any way?

c. Are work demands consistent with what can be achieved in a day? If not, please explain.

d. Do you have to take work home in the evening or on weekends? If so, how often do you take work home? What type of work do you do at home?

e. Are you ever asked to take work home, or do you take work home on a voluntary basis?

f. Do work demands affect your home life? If so, how?

g. Has technology affected the relationship between your work and home life? Has it facilitated working at home?

10) a. How much control do you feel you have over your work?

b. To what extent can you personally schedule, pace, and prioritize the completion of assigned tasks?

c. How do you go about carrying out assigned tasks?

d. Do you ever have conflicting demands? How do you handle them?

e. Have new technologies changed the ways in which you manage your work or carry out assigned tasks? How?

f. Do you have more or less flexibility (or choices) with working hours or arrangements?

11) a. Do you use ICTs for internal communications, external communications, or both? Which ones do you use?

b. Who do you communicate with electronically (e.g., colleagues, supervisors, clients, etc.)?

c. How do you use technologies to communicate with others?

d. Have ICTs changed the way you communicate with others? How?

e. Have new technologies affected interpersonal relationships at work? How?

12) a. Does your job provide opportunities to do work you consider important? Please elaborate.

b. What rewards or personal satisfaction do you derive from your work?

c. Does technology support, facilitate, or impede your ability to do meaningful work? How?

13) a. Are your values similar to the values of others in your organization? How are they similar? How are they different?

b. Does ICT help you achieve organizational goals? If so, how?

c. How would you describe your organization's culture? Has technology had an impact?

14) Has the quality of service or work in your organization changed since the introduction of new technologies? Are things getting better or worse?

15) a. Do you feel you have the necessary skills and experience to use new technologies in your work?

b. Have you received any training in the use of new technologies? If so, how useful was the training you received?

c. Would any other type of training or orientation be useful? If so, what type?

16) a. Does the introduction of a new technology cause you stress? If so, how and why?

b. Does technology affect your stress level on an ongoing basis? If so, how and why?

c. Has technology affected your health in any way?

17) a. How do you feel about your job? Have new technologies affected the way you feel about your job?

b. How do you feel when you think about using new technologies at work?

c. How would you describe your comfort level with ICTs?

18) a. Has the use of ICTs affected your energy level at work? How?

b. Have you become more or less involved in your work?

c. Have ICTs improved or exacerbated your ability to do your job?

Appendix C – Data Matrix

Theory/Model	Variable	Interview Questions (Part Two)	Sample Responses
Over 80 per cent of managers, professionals, and clerical workers in the public and NFP sectors use computers, email, Internet, and voice messaging. Approximately 50 per cent use cell phones (Statistics Canada, 2001a, b; Bakker, 2000; Sciadas, 2002). ICT is driving and facilitating organizational change, including downsizing and re-engineering (Betcherman & McMullen, 1998; Methot & Phillips-Grant, 1998). Career development issues may be a source of job stress (Ivancevich & Matteson, 1980). Human resource issues in ICT receive less attention than organizational structure and design (Baldwin, 1999).	ICT Use cell phones computers email Internet voice messaging	1 2 5 14 Part One: 1-7	"Ninety per cent of the day is spent on using the computer." "cell phone is on 24 hours a day, seven days a week" "In terms of the Internet, I'm logged on 24 hours a day" "opening up 75 emails every morning" "between two and three hundred emails a day" "start with my voice mails at 7 o'clock in the morning" "voice mail I use constantly" "jobs have been eliminated" "cuts manpower" "increased our staff" "redefined jobs" "major staff reorganization" "some individuals...work at home" "Individuals have become their own secretaries" "some people have taken to this like ducks to water...other people are just falling further and further behind" "individualized career mapping...don't think it's our strength" "not enough time spent on how to leverage technology for advantage" "we don't have the time to train"
Work overload and skill degradation contribute to job stress. Work overload can be quantitative, as in having too much to do, qualitative, as in setting unrealistic performance standards, or both (Ivancevich & Matteson, 1980, Karasek & Theorell, 1990). The use of new technologies may create new cognitive demands	Workload too much work (quantitative overload) work too difficult (qualitative overload)	3a-c 4a-c 7a-d 9a-g	"you're being asked to do a lot more" "more research, more data, more information" "more services" "the quality of work has increased, the quantity of output has increased" "workload has increased with the availability of email and faxes before that" "failure is not an option...you have to perform at a very high level" "puts a bigger demand ... I don't feel belongs there" "you have to have more skills"

(Briner & Hockey, 1988; Ganster, Hurrell, & Thomas, 1987), ongoing cognitive demands (Bandura, 2001) and changes in skill requirements, including upgrading and deskilling (Attewell & Rule, 1984; Cooper & Smith, 1984; Earl, 1996; Leckie et al, 2001, Statistics Canada, 2001a). ICT demands may exacerbate workload (Cooper, 1998) and create information overload (Symon, 2000). ICT may contribute to work-life conflict (Duxbury & Higgins, 2002; Leiter & Durup, 1996).			"there's always more demands" "more demanding" "more is expected" "totally unreasonable" "almost unbearable" "totally overwhelming" "don't manage to do everything" "avalanche of information" "too much information" "blurred the lines with respect to when you're on duty and when you're not" "I'll take a lot of it home" "I pump in lots of extra hours, lots of stuff from home, emails from home" "tap into it from home" "evenings are difficult" "I don't have a home life" "I work Sundays" "take work home almost every day"
ICT may reduce perceived control (Frese, 1987), increase time pressures (Zapf, 1995), and exacerbate role stress (Burke, 1988; Levi, 1998; Paoli, 1997). Deskilling may reduce decision latitude and control over how work is carried out (Buchanan & Boddy, 1983; Turner, 1984; Zuboff, 1988). Increased interruptions (Mintzberg, 1999) and increased accessibility to others (Sproull & Kiesler, 1991) may create a turbulent environment, reducing perceived control. Daily occupational hassles (Kanner et al., 1981), such as equipment and software	**Control** reduced decision latitude turbulent conditions	6a,b 10a-f	"very little control" "very limited" "not a great deal" "some control" "not a lot of control" "people send you stuff at the very last minute" "everybody wants everything faster and faster" "expectation of rapid turnaround or rapid response" "everybody expects an immediate response" "expectation of an immediate response...takes me away from other things" "days fritter away between the email, the voice mail, and responding to these" "five things that are wanted at the same time" "different people saying, 'do this and this and this,' and having to do this and this and this...at the same time" "conflicting demands...a lot of stress"

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problems (Karasek & Theorell, 1990), may add to perceptions of work overload and contribute to negative mood and fatigue (Zohar, 1999).			"bullets shooting at you" "a big pain in the neck...interrupts everything you do" "a real nuisance" "too many points of entry: email, voice mail, faxes, meetings, visits" "a thousand points of entry" "we freak out when the system crashes" "problems with the email... viruses...it's very stressing" "usually when things are going bad, the computer fails...it affects my mood" "problems on the software...add to the stress"
Social support may reduce job stress (Baba et al., 1999; House, 1981). Technology may increase isolation (Kraut et al., 1998). ICT may promote depersonalization (Cartwright & Cooper, 1997). Reduced social cues in lean media may have negative outcomes generating tension and conflict (Nohria & Eccles, 1992).	**Community** increased isolation depersonal-ization	2 11a-e	"people don't talk to each other as much" "it's taken away from the face-to-face conversations, the more direct communication" "takes away personal touch" "I miss that personal touch" "takes out the human contact" "human contact...seems to be lost in the translation" "depersonalizes...not only with clients but with co-workers" "IT department doesn't even pick up the phone" "emails written entirely in capital letters... meant to be in your face" "email...abused by some managers who don't like to talk directly to staff" "I think it causes a lot of miscommunication" "I'm trying to choose my words more carefully" "they show their anger in an email"
A mismatch between organizational and individual values can disrupt relationships in the workplace. A better match may promote job engagement (Maslach & Leiter, 1997; Maslach et al., 2001). Culture may influence the ways in which technology is employed in organizations (Mantovani,	**Values**	12a-c 13a-c	"it's a strange culture...people come and go" "basic values...fairly similar" "how to help people; our values are the same" "a very strong work ethic" "collegial atmosphere" "stuff we do...really does further the interests of the community" "not a 9 to 5 job" "we come in early and stay late...we just get it done"

1994; Marcus, 1994; McKenney et al., 1992; Orlikowski, 1992; Zuboff, 1988).			"committed, devoted people" "this is like family; this is not work" "makes you feel good" "everybody here is very proud of this institution" "allowing us to do meaningful work more quickly"
The ability to effectively adapt to new technologies may depend, in part, on training and learning support (Bikson, 1987). The need to adapt may be continuous as technological change is ongoing (Boddy & Gunson, 1996; Cascio, 1995). Training may be motivating. Employees who have received training in conjunction with ICT adoption report higher levels of job satisfaction and organizational commitment (Leckie et al., 2001).	**Training**	15b-c	"I could learn a lot more" "you have to have more skills" "I would like to take more courses" "I would like to learn more" "more formal training could benefit" "we have to do a little more of that" "we have to, we have to, we have to" "not in a classroom setting; it has to be one-on-one" "wasn't helpful" "it's a nice thing to do for us" "people appreciate any training; they really do"
Stress is a response to change that generates new demands in the work environment (McGrath, 1970). Stress and strain occur when resources do not exist in proportion to demands (Karasek, 1979; Folkman et al., 1986). Chronic stress has a stronger impact on strain than does acute stress (Beehr, 1998). ICT may contribute to stress and depression (Duxbury & Higgins, 2002; ILO, 2000; WHO, 2001). The impact of ICT on workload, control, and community may exacerbate job stress and add to health problems	**Stress/Strain** increased demands inadequate resources	8a,b 15a 16a-c 17a-c	"there's stresses because technology is always changing, and it raises new expectations" "things used to change and...you lived with it 15 years or so...and now it's monthly" "you've done something one way for 20 years...and then switching; it's like petrifying" "every time you need to make a shift and a change...you experience that stress" "tension between increased volume and expectation of rapid turnaround" "how much input can one absorb, digest, assimilate, and not choke on" "there's always something new ...we have to learn... it just keeps coming and coming and coming...so there's no break" "very stressful...overload of work" "stressed...when the load becomes too heavy" "demands for data...are totally unrealistic" "more stressful, more anxiety" "the stress level's up" "I get headaches"

(Cartwright & Cooper, 1997; Karasek & Theorell, 1990; Sauter & Hurrell, 1987). Changes in skill requirements (Attewell & Rule, 1984; Cooper & Smith, 1984; Turner, 1984; Zapf, 1995) and attentional and cognitive demands (Bandura, 2001; Bikson, 1987; Ganster et al., 1987) can add to stress and strain. Time pressures (Bradley, 1983; Brodbeck et al., 1993; Liff, 1990) exacerbate stress and strain. Equipment problems (Burke, 1990; Caplan & Jones, 1975; Johansson & Aronsson, 1984) may contribute to job stress. Reduced social contact and support (Cartwright & Cooper, 1997; Kraut et al., 1998) can add to stress.			"my stomach's churning all the time" "my eyes have deteriorated" "I never wore glasses...but now I have three prescriptions...they say it's the computer" "can't sleep sometimes" "took anti-anxiety pills...because of overload of work" "I'm constantly anxious" "more challenging...makes it a lot more stressful as well" "when you have to learn a new program, even a new way of doing things...there is stress" "volume has intensified... and my ability to engage that volume is not commensurate" "adds to my stress...speed has increased" "it's taking up most of my time and energy" "the machine keeps pinging...the phone keeps ringing...people use that messaging as well...it creates...stress" "If I've had a bad day on the computer and it's been giving me grief... I come home stressed." "I work in a building full of Luddites" "it's very bad...people don't talk to each other as much" "people are emailing all the time when they should be talking and that's bad"
Burnout stems from a mismatch between the person and the environment (Maslach & Leiter, 1997, 2001). ICT may contribute to burnout (ILO, 2000, Paoli, 1997; Leckie et al., 2001) The impact of ICT on workload, control, and community may trigger fatigue or exhaustion (Burke, 1988), and promote feelings of inefficacy (Bandura, 2001; Maslach, 1998).	**Burnout** exhaustion inefficacy	18a-c	"totally exhausted all the time" "have no energy to do anything" "much more tired" "a certain lethargy" "extremely, extremely draining" "it's tiring; it's exhausting" "it's overwhelming" "a locomotive chasing us down a track. We're running as fast as we can, but at some point it's gonna run us over...you can't keep running that fast"

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