Nodes in the Network:
An exploration of the paths of high-tech professionals
towards occupational success in the Montreal area

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ABSTRACT

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As products of the network society, high-tech professionals find themselves nodes in many different, interrelated organizational and personal networks – nodes in the global network of production, nodes in the structures of their companies, nodes in the networks of their work colleagues, nodes in a greater network of professionals, nodes in personal networks.

In examining the research done on the rise of the network society and the attached reorganization of work structures involved, this thesis aims to understand how the high-tech professionals interviewed cope with being *disposable* 'nodes' along these networks. Based on other studies concerning constructions of work roles and the culture of work in the informational era, this thesis also explores how the professionals interviewed perceived the values of high-tech industry, the uses and constructions of high-tech organizational work environments, and their constructions of work-selves and 'true'-selves.

The research involved with this study was based on fourteen structured individual interviews, and participant observation in a high-tech organization and in informal group settings with high-tech professionals. Work in the network society can be seen as disaggregating – this thesis demonstrates that under such conditions, the high-tech professionals interviewed have shaped the determinants of their identities to fall outside the networks associated with work in an efficient manner of dealing with professional ambiguities.

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DEDICATION

To my husband, for all of his love and support.

Nodes in the Network:
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1.0 INTRODUCTION

In the uncertain world of high-tech, how do the professionals cope? As products of the network society, high-tech professionals find themselves nodes in many different, interrelated organizational and personal networks – nodes in the global network of production, nodes in the structures of their companies, nodes in the networks of their work colleagues, nodes in a greater network of professionals, nodes in personal networks.

In examining the research done on the rise of the network society and the attached reorganization of work structures involved, this thesis aims to understand how the high-tech professionals interviewed cope with being *disposable* 'nodes' along these networks. Based on other studies concerning constructions of work roles and the culture of work in the informational era, this thesis also explores how the professionals interviewed perceived the values of high-tech industry, the uses and constructions of high-tech organizational work environments, their constructions of work-selves and 'true'-selves, and whether this points differed among the men and women interviewed.

The research involved with this study was based on fourteen structured individual interviews, participant observation in a high-tech organization and in informal group settings with high-tech professionals. Work in the network society can be seen as disaggregating – this thesis demonstrates that under such conditions, the high-tech professionals interviewed whether male or female, have shaped the determinants of their

identities to fall outside the networks associated with work in an efficient manner of

dealing with professional ambiguities.

1.1   High-tech in Montreal and the reorganization of work

Montreal is a city well-known for its burgeoning 'tech' industries, ranging from those

producing actual tangible products, and those producing highly coveted, yet highly

intangible, *intellectual property* (IP). In recent years, millions of dollars from both the

Canadian and Quebec governments have been poured into the local economy in support

the expansion of the 'high-tech' sectors of the city and in a push for the revitalization of

the economy from industry to technology. The numbers of engineering and computer

science graduates in the Canada have also increased by leaps and bounds in the past

fifteen years – where the number of engineering graduates jumped from 7.74% in 1991 to

8.75% in 2001 of all graduates in those years and in 2001 graduates of computer science

grew from being lumped in with a myriad of other programs of study, to holding their

own at 3.09% of the graduates of 2001 (Statscan). All of these factors have contributed

to making Montreal a central resource to the country's technological economy.

Assembly line layouts may still persist in those companies who produce *hardware*, or the

actual electronic components of our computers, televisions, DVD players and other

electronic devices. However, a new breed of company has grown in support of these

hardware-based industries, tied to the creation of *software* in order to make all of these

electronic connections possible. The realities of high-tech knowledge production in both

the domains of software and hardware, is that of the network society – where modern

management practice and structures are based on the use of loose networks, that are more

open to decisive reinvention than the pyramidal hierarchies that ruled during the Fordist

era (Castells, 1996; Sennett, 1998). While some of the processes of production used in

the development of software and hardware, may still resemble the constructs of Fordism ,

where large scale projects are still broken down into components parts and assigned to

developers to design – for the most part, high-tech companies find themselves

particularly well suited to what Sennett terms the 'flexible specialization' of production

in their attempts to get their varied products ever more quickly to market (1998, 51).

While these methods of production then leave the high-tech company much more geared

and in tuned with the needs and wants of their clients and industry, they also leave the

professionals that work in these organizations to deal with uncertain employment

conditions, as they are absorbed or rejected from the workings of the network

organization unpredictably.

High-Tech companies often find that what they produce falls somewhere in between

service and manufacturing industries, as do the parameters of the jobs of their employees.

And while they often offer their clients some form of diskette, data CD, or specialized

computer system at the end of the production process, the process behind that final

product is, whether new or an improvement on existing technologies in its shape and

form; a creative process. However, this process is not so seemingly different when

compared to the growth of the 'producer' or 'specialized' services that were a response to

a down-sizing of middle-management in corporations during the 1980s. As a result of the network economy, other producer services such as management consulting, advertising, accounting, law and a host of other types of consultancy including high-tech, have grown by leaps and bounds in the last three decades. In this sense, the producer services find themselves nodes in the networks of the new reorganization of work – they are hired to meet specific needs, and released when those needs have be satiated.

The reality of these types of services in the network society, is that forms of tacit and codified knowledge are increasingly more important (Bryson et al, 2004, 6). Complementing this sentiment, today's economic system is one in which a significant amount of value is vested in the types of knowledge products that the high-tech professional provides (ibid, 46). The workforce of high-tech firms tend to be highly skilled and educated such as engineers and computer science graduates – people who through their schooling, are technically trained to be analytical, but who must quickly develop the creativity of development methods that companies crave, in order to keep up with the pace of adaptation required by the flexible specialization production process. After all, it is this creativeness and innovation that allows for the 'building' of new and improved products for companies to sell, making the role of the high-tech employee different than that of just a traditional assembly-line worker. In fact, in Bryson et al. 2004 study of producer services, the fastest growing occupation of the US workforce was computer and software engineers (Bryson et al: 2004 107).

The heightened importance of the cognitive processes of the high-tech professional, presents a new problem for those companies holding onto traditional hierarchical organizational structures from the pre-network economy era. Similar to other producer services, these software and hardware developers would traditionally be considered middle-class or middle-management workers within the grander scheme of the organization – with little power or control over the corporate culture and how they fit within the organizational structure, but possessing a fit somewhere in that structure none-the-less. In the new networked organizational plan however, these professionals are different, their informal creative processes helping to shape the formal orientation of the companies they work for, and vice versa. The main question of concern here concerns: how this push and pull between the more 'formal' structures of the high-tech company and the more informal structures of the high-tech professionals are negotiated by the high-tech professionals involved.

As we find ourselves well into the informational age, many tested forms of bureaucratic and hierarchical corporate structure have given way to structures that are more decentralized in nature – the 'flat' or networked organization. With this, the initial values of flat organizations revolve around the concept that knowledge can be found at any point up or down the chain of command (McShane: 2004; Sennett:1998;Castells: 1996). By removing the confines of corporate hierarchies, the theory is that ideas and knowledge can now flow more freely to the people who can most use it and effect change (ibid). However, as Castells explores in his account of the *Network Society* and Sennett attacks

in his *The Corrosion of Character*, the use of decentralized networks, as a form of

organizational structure, means that nodes at any point of the organizational structure can

be removed or added depending on the informational flows received by the company. In

this sense, companies are no longer responsible for their employees or 'nodes' so that in

reality these employees can be disposed of at any point should demand no longer

necessitate their connection to the network.

The industry labeled as high-tech emerged as these new networked corporate models

were first being tested, and were quickly adopted and manipulated by high-tech as their

own. As high-tech companies are naturally at the forefront of the technological wave,

they are good models for the study of the effects of new organizational factors on their

organizational cultures and their employees. In this sense, the effects on high-tech can

also be of relevance to companies thinking of instituting similar organizational policies to

plan against the perils of the network economy.

When initially considering a study of high-tech professionals as the basis for my thesis,

the 'spark' for the topic came from seeing a few acquaintances have to negotiate the job

market after the dot-com crash in 2000-2001. Coming from a business background with

an interest in Human Resources and Organizational Behavior, I wondered what the job

market conditions and organizational structures were like in the high-tech industry.

Although the body of work on high-tech culture continues to grow, as Barrett points out

in his study of a high-tech organization, the speed at which information technology

innovation occurs means that there is a general lack of understanding about high-tech

work and companies, and how they function (2004, 778). With this, the high-drama

surrounding the high-tech industry obscures much of the reality of high-tech development

work and its management (ibid). I was interested in finding out what these realities were,

and if they were commonly shared by the professionals of the industry. With this in mind,

I was interested in finding out why these acquaintances working in high-tech seemed

unfazed by their layoffs – what were the conditions existing within the industry or the

professional culture that allowed them to manage so gracefully with the job-market

conditions of their industry? In this sense, the main problematic of this thesis is how the

high-tech professional copes with uncertainty in the high-tech industry, which is in turn

influenced by the global reorganizations of work that have occurred in the last three

decades – shifting work structures, from bureaucratic pyramids of order, to loose nodal

networks of flexible production.

With its growing number of 'high-tech' companies, many of them exploring the

profitability of software and other intellectual property development – Montreal is a

useful setting for the study of the cultures of these high-technology companies and

professionals, as they apply to the rise and growth of the network society.

1.2   Nodes in the Network

Similar to the high-tech professionals that I interviewed, J.A. English-Lueck in her study

of Silicon Valley (2002), uses the residents and technology developers that live in Silicon

Valley as a case to reveal the experiences and consequences of the technological

saturation aspired to in the informational age and network society (10). She suggests that

high-tech work is distinctive, where much of it is knowledge work – receiving,

manipulating and passing along bits of information through a set of interdependent

professionals (ibid, 23). As will be explored later in this thesis, this type of work

involves creativity and often a great deal of it (ibid, 23), and is based on the values of

innovation and technology attached to the rise of the information age. The Silicon Valley

ethos then becomes a merging of pragmatism and the search for meaning, where people

'use' other people as tools for advancement, but are also bound in a web of genuine

affection and reciprocal exchanges; where struggles with technology are perceived to

have a moral component and being able to overcome these technological struggles is seen

as a sign of character and persistence (ibid, 34).

As citizens of the 'network' society and employees of 'networked' organizations, high-

tech professionals find themselves 'nodes' in many different but interrelated

organizational and personal networks, some of which affect their work lives directly, and

others, which affect their sense of who they are. The danger here, lies in the fact that any

changes to one of these networks influencing perceptions of work and self for the high-

tech professional, can also spell disaster for the professional and their other, connected

networks. In this sense, the high-tech professionals that I interviewed are in a limbo of

sorts, where the lines between work-life, home and one's identity are in a state of flexible

production itself – forced to adapt to new economic, and informational conditions at an ever-increasing pace.

The environmental forces influencing the networks used by the high-tech professionals that I interviewed resonate at many different levels throughout their numerous networks. The first is in the changing perceptions of the values that fuel high-tech industry – the values of innovation and technology. As one of the driving forces behind the informational age, information can be dispersed at an increasingly rapid rate due to technological advances – this in turn shapes the rate at which networked companies are able to bring their products to production. In this sense, the high-tech professionals that I interviewed perceived their work to be at the forefront of this informational and technological race.

However, the organizational environments within which the high-tech professionals that I interviewed worked, to a certain extent would seem to be at odds with this process of innovation and technological advancement. Almost all of the work environments of those that I interviewed were in an open-concept layout. Part of the perception of this format of office environment, among the high-tech professionals interviewed was that it allowed for a freer exchange of ideas. However, as Freeman suggests in her book on the work of female data-entry workers in the Caribbean – the open-concept office is much more closely related to the ability of management to control and exert surveillance over the work of their employees (2000). The actions and work behaviors of those that I

interviewed would suggest that Freeman's diagnosis is correct, since they have developed

techniques to overcome the lack of personal space and issues of privacy attached to an

open-concept work environment such as 'zoning-out' and 'flow'. The nature of the de-

personalized workspaces described by the high-tech professionals interviewed, then

continue to feed the view that the work of high-tech is nodal, in that employees in an

open-concept office are not 'allowed' to form strong connections to the work

environment, and as 'nodes' in the scope of flexible production, they can be removed or

added to the mix at will.

Also attached to working in high-tech, the professionals that I interviewed described their

work in terms of the different roles that they held in their 'network' organizations, that in

turn could be commonly applied as role types, and personality types throughout the high-

tech industry. In particular, these roles were as *coders*, *managers*, and *teachers*, and the

personality types within each of these roles fit somewhere in between that of *geeks* and

people-people. These clear definitions of self within the work environment seemed to

help those that I interviewed to quickly situate their 'status' in the organizations that they

worked for and helped them to again situate themselves once more, when they were

forced by economic or personal events to move to new companies.

The high-tech professionals that I interviewed developed different coping techniques in

order to better negotiate the flexible and constantly changing modes of production of the

network economy and organization. Of these techniques, I saw the use of *job-hopping*

and related personal/professional networking – used variously as a kind of 'security blanket' against downsizing, as a means of climbing the corporate ladder, as a means of improving skill sets, or as a means of increasing salary scales. In this sense, the building of career in the network society is based on the building of professional and personal networks, in order to cope with the uncertainties attached to flexible production.

Also mentioned by the professionals that I interviewed, was a strong identification of who they were with the activities that they would conduct outside of work – in this sense, who they truly were, the true nature of their characters, was not influenced by the constantly changing parameters of the network organization, lending them balance and boundaries to their lives. It would seem that among the female professionals that I encountered, their methods for coping with the constructions and fluctuations of the network organizations that they work for were not drastically different from those techniques used by the men interviewed. The only difference that seemed to surface concerning the women interviewed, was that they sought a more social dimension to their work – more of an interaction with people, than an interaction solely with machines.

While the different personal networks surrounding the high-tech professionals that I interviewed may be seen as providing a social web that prevents free-fall in times of need (English –Lueck: 2002, 176), I would suggest that the high-tech professionals I interviewed try to place these types of stable networks – networks built on trust – at a distance from the more morphological and unstable networks of their work environments.

To reiterate again, in an overall context, this thesis discusses how the high-tech professionals I interviewed deal with being mere (disposable) nodes in a networked society – nodes in the global network of production, nodes in the structures of their companies, nodes in the networks of their work colleagues, nodes in a greater network of professionals, nodes in personal networks – and how in turn, they try to shape the main determinants of their identities to fall outside of these continually changing networks, in order to provide them as Sennett proposes – a sense of stability, a sense of character.

2.0 LITERATURE REVIEW

2.1 A Reorganization of Work

In the last fifty years, the western economies have undergone rapid changes shifting from the eras of industrialization to post-industrialization to an era that many have now termed the information age (Castell, 1996). However, in order to properly understand what the dawn of this new information age has brought and the systems at work within it, we must first understand what preceded it.

This new era in which we live can be seen as a continuation of industrialization. New production methods today still involve the replacement of human skills in the production of goods and services with machines and the replacement of human or animal energy with inanimate sources of power (Smucker:1980, 1). Still today, industry is also characterized by a division of work roles that necessitates the creation of structures to co-ordinate and control those work roles (ibid). The process of industrialization also resulted in new class structures resting in large part upon the relationship of individuals to the organization – a relationship that is continually shifting even today, as new occupations and new organizations have emerged, contributing to, but also influencing the course of industrialization itself (ibid). People still find themselves dependent upon the fluctuations of prices, wages and employment opportunities, and companies more than ever are guilty of reducing their employees to functional appendages of the production process (ibid).

However, what has changed in the information age, is the type of the centralization of production. In the past, the use of inanimate sources of power required that individuals be brought together to one place in order to work in concert with machines (Smucker, 1980) – today employees can find themselves scattered around the globe, all still working in concert for the production of some form of good or service. In this sense, it is not surprising that much of the manufacturing plants which produce the consumer goods we use everyday find themselves in developing countries – which boast less legislation attached to the protection of workers, and lower wage rates. As Sassen postulates in her work on global cities – the centralization of production has changed, to be a centralization of producer services in urban centers, while the sites of production can shift with the next lowest bidder (2001). With this, individuals working in the information age no longer expect that they will be employed in a job most of their lives; however, they still find themselves subject to different hierarchies of authority and rewarded with wages or salaries if they perform their jobs adequately (Smucker, 1980).

In this new information age, capitalism itself has undergone restructuring due to new developments in technologies, becoming truly global and characterized by (Castells, 1996):

(a) a greater flexibility in management;

(b) decentralization and networking of firms both internally and in their relationship to other firms;

(c) a considerable empowering of capital with respect to labor;

(d) increasing diversification and individualization of working relationships;

(e) a significant growth of women in the workforce; and

(f) intervention of the state to deregulate markets selectively depending on

political influences.

As Carrier and Miller explore in their discussion of 'virtualism' in the political economy; there exists a trend in the west towards a 'disembedding' of economic activities from the social and other relationships with which they had associated in the past (Carrier et al: 1998, 2). This new 'virtualism' of the economy means that these activities are now carried out in a context in which the only important relationships are those defined by the economic activity itself (ibid). In this sense, economic activity becomes abstracted from social relations (ibid). The social obligations of the company towards its employees are lost along the path towards the network organization.

But when did this process begin? In the 1970s, a technological blossoming of sorts began to surface related to a culture of freedom, individual innovation and entrepreneurism that grew out of the 1960s culture of US campuses – materializing a new way of producing, communicating, managing and living (Castells, 1996). This Information Technology Revolution, was instrumental in allowing the implementation of a fundamental process of restructuring of the capitalist system from the 1980s onward (ibid). This restructuring of capitalism involved a decisive effort at deregulation, privatization, and dismantling of the previous social contract that had existed between capital and labor (the employment for

life mentioned above)(ibid). Technological innovation and organizational change now

focused on new values of flexibility and adaptability (ibid).

A fundamental driving force behind these changes, was the growing power and influence

of financial institutions as share-holders in firms, and the emergence of what has been

called "finance capitalism" (Stiglitz, 2002; Useem, 1993, 1996). With this shift in power,

away from management toward institutional investors, firms were forced to devise ways

to meet continual and short-term demands of profitability rather than focusing on long-

term development projects. Constant pressures from institutional investors to meet

profitable quarterly returns have driven business firms to cut costs and seek flexibility in

meeting not only investors' demands but also in remaining competitive in uncertain

global markets. Driven in large part by the American economy where financial

institutions are currently dominant, the competitive nature of global markets is far greater

for all components of production than has been experienced in the past. Meanwhile,

managers no longer have the luxury of enduring low or negative profits in the interests of

higher returns in the long-term (Fligstein, 1990; Useem, 1993, 1996).

If one response to greater competition has been greater flexibility, information

technology has been an integral part of this process. In addition, access to rapid

transportation has also contributed to the ability of firms to be more flexible in their

responses to increased competitive pressures. What exists today is a cumulative feedback

loop between innovation and the uses of innovation, where the diffusion of technology

endlessly amplifies the power of technology, as technology becomes appropriated and

redefined by its users (Castell:1996, 32). Growing from this technological revolution is

what Castell terms the Information Technology Paradigm that is the material foundation

of the Informational Society, and characterized by (1996:61-62):

(1) information as a raw material;

(2) pervasiveness of the effects of new technologies because information is an

integral part to all human activity, all processes of our individual and

collective existence are directly shaped by the new technological medium;

(3) networking logic of any system or set of relationships using these new

information technologies, where networks seem to be well adapted to the

increasing complexity of interaction arising from the creative power of such

interactions;

(4) flexibility, where not only processes are reversible, but organizations and

institutions can be modified and even fundamentally altered by rearranging

their components (constant change and organizational fluidity); and

(5) the convergence of specific technologies into highly integrated systems.

In keeping with these key features of the informational society, the re-organization of

work beginning in the 1970s was such that new strategies of technological innovation,

and organizational decentralization occurred in an effort to increase profits by: (1)

reducing production costs (labor); (2) increasing productivity; (3) broadening markets;

and (4) accelerating capital turnover (Castells:1996, 81). This in turn led to companies

extending their global reach, integrating markets and maximizing the advantages of

location and capital, and in turn catalyzing the substantial increases in profitability of

firms seen in the 1990s (ibid, 88). With this, labor became a global resource (ibid, 93). In

this new 'global web' of production, the production process incorporates components

produced in many different locations, by different firms and assembled for specific

purposes and specific markets in a new form of production and commercialization that is

characterized by high volumes, flexible, and customized production (Robert Reich in

Castells:1996, 96). The Network Enterprise was born based on the values of flexibility

and adaptability to market conditions...

This new 'network' system of production is one in which the system for production can

easily change based on new informational inputs (Castells: 1996, 154), where the

corporation itself has changed its organizational model to adapt to conditions of

unpredictability caused by rapid economic and technological changes – a shift from

vertical bureaucracies to the horizontal corporation (ibid, 164). In order to internalize the

benefits of network flexibility, the corporation had to become a network itself,

dynamizing each element of its internal structure (ibid). Information circulates through

the networks – networks between companies, networks within companies, personal

networks and computer networks – resulting in a flexible production model that

maximizes the response of economic agents and units to a fast changing environment

(ibid, 165-166). This is precisely the environment in which the high-tech professionals

find themselves – one in which companies must have the capacity to restructure and

reinvent themselves at an ever increasing pace. With this, the characteristics of the

horizontal corporation is such that it is a dynamic and strategically planned network of

self-programmed, self-directed units based on decentralization, participation and

coordination (ibid).

But what exactly is meant by 'networks' in the new informational capitalism? A network

is essentially a set of interconnected nodes, where networks are open structures able to

expand without limits, integrating new nodes along the way as long as they are able to

communicate with the network, and as long as they share the same communication

'codes' (Castells:1996, 470). In this sense, the advantage of a network is that there are

endless possibilities for deconstruction and reconstruction of the corporation in order to

be flexible and adaptable to quickly changing economic conditions (Castells:1996, 471).

The cornerstone of modern management practices is the belief that companies based on

loose networks are more open to decisive and rapid reinvention than the old pyramidal

hierarchies that ruled the Fordist era (Sennett:1998, 48). The join between the nodes in a

network is looser today, where companies can remove parts of the network (in theory)

without destroying the whole (ibid). However, the most salient fact of this reengineering

of organizational structure, is the down-sizing of jobs and that most of these

reengineering efforts fail because the institutions undergoing the changes become

dysfunctional during the people-squeezing process (ibid, 49). In the context of the high-

tech organizations, Sennett's concept of 'flexible specialization' seems applicable, as

these companies (as do other companies in other fields) try to get more varied products ever more quickly to market (ibid, 51). In high-tech, this method is of particular interest, as the computer makes programming work easy to change and reconfigure, and the speed of communication makes global market data instantly available. In turn this necessitates the quick decision-making that suits small work groups, rather than the slow decision-making of large bureaucratic firms (ibid, 52). The new network organization allows its internal structure to be shaped by the shifting demands of the outside, networked world – where the need for responsiveness equals the acceptance of disruptive change (ibid).

With the growth of the 'network' organization, there arose a displacement (read - downsizing) of labor, thinning the ranks of what used to be middle management in the traditional hierarchical bureaucracy. Companies no longer required the same types of in-house expertise that they required in the past, and with increasingly rapid rates of technological evolution in order to manage informational networks; having this type of expertise in-house became nearly impossible. This in turn gave birth to a new occupational reality – the 'producer' or 'specialized' services, and 'flexible employment' (Castells:1996, 239).

The rapid growth in the last twenty years in what is known as the producer services is a product of the same internationalization and technological change that fuelled the rise of the new economy (Bryson et al:2004, 76). As companies de-integrated the levels of their bureaucracies, moving towards more flat organizational structures; there grew an

increased demand for specialist business and professional services (ibid). With this, the more specialized the input, the less likely that a firm will be able to retain its own staff in order to provide this service when required (ibid, 77). In externalizing this expertise, companies are able to substitute variable costs for fixed ones, and spread round the risks of production, passing it onto the service providers (ibid, 78). To be successful, any producer services professional must possess three key attributes – expertise, reputation and a network of client contacts (ibid, 102). With this, there has been an explosion of small firms in this area of the economy, as established professionals are able to resign from their existing employer and establish their own businesses by capitalizing on their reputations and client contacts (ibid). Understandably, service work has become a hybrid of work in which the economic and cultural are blurred – the use of image, presentation, communication and display have all become important factors in how effective a professional within the producer services will be (ibid, 111), and in turn this affects their profitability. In this sense, the work of the high-tech professional can be seen to fit the model of the producer services, as they possess a particular expertise in software or hardware development, that is sought after by the companies that they work for in order to produce their products and bring them to the market. Also in the sense of producer services, high-tech professionals find themselves jumping from company to company, whether they are working on limited contracts, forced to readjust due to downsizing or are just in the plain need of tackling something new.

With the strengthening of globalization, and the weakening of national ties, the economic activity of the 'network organization' now entails a new type of organizational structure, where localities are now based on what Sassen entitles the 'Global City'(2001). With this, the 'global city' model involves seven key features according to Sassen (2001, xix-xxi):

1. The geographic dispersal of economic activities along with the simultaneous integration of these geographically dispersed activities feeds the importance of central corporate functions – the more dispersed a firm's operations, the more complex and strategic its central functions;

2. These central functions become so complex that the headquarters of large global firms are forced to outsource them – they buy a share of their central functions from highly specialized service firms (eg. Accounting, legal, etc), which now become second key sites of production to the companies' headquarters.

3. These specialized service firms are subject to agglomeration economies, where the mix of firms, talents, and expertise from a broad range of specialized fields makes a certain type of urban environment function as an information center – the city becomes a very dense and intense information loop.

4. More companies outsource their most complex, non-standard functions especially those that are prone to uncertain and changing markets.

5. These specialized service firms need to provide for global services which means they must possess a global network of affiliates or some other form of partnership – a need for transnational servicing networks.

6. A growing number of high-paid professionals and high-profit specialized service firms have the effect of increasing the level of socioeconomic inequality in these global cities. And lastly,

7. The growth in these higher paid jobs, and high-profit companies leads to an informalization of production and distribution including services .

The high-tech professionals interviewed in this exploration, find themselves in a variant of this 'global city', whereby Montreal finds itself with a specialty in the development of software and hardware, especially with reference to video products. In this sense, Montreal can be seen as a high-tech 'Mecca' of sorts with respect to this specialized branch of high-tech.

These issues are echoed by Amit's discussion of consultancy as researched in the Caribbean and in North America (2002). With the necessity for the producer services firmly in place, many experts now move transnationally through the pathways shaped by the re-structuring of the production of labor in the network society (Amit: 2002, 149). As the network society becomes more and more of a reality; examining this shift in the organization of employment towards a model of 'disembedded' economic agency (see Carrier and Miller above), and asserting an unencumbered movement of individuals between places and organizations, is now of growing interest (ibid). Echoed by Sassen, Castells and Sennett above, contracting out is first and foremost oriented towards rendering labor more disposable and hence cheaper (ibid,150). Furthermore, the expansion of freestanding consultancy services reflects heightened demands for even

more specialized skills to meet technological, communication and marketing shifts –

demands that would have been difficult to meet entirely in-house (ibid). Therefore the

effect of contracting out has been to extend the conditions of waged labor up the

occupational and educational ladder (ibid) – as is also the experience of the high-tech

worker, who bounces from contract to job to next job (job-hopping).

Hand-in-hand with the development of the producer services and flexible employment,

emerged the practice of 'lean production' methods such as subcontracting, outsourcing,

off-shoring, consulting, downsizing, and customizing in labor, leading to an increase in

the market place of those who were either self-employed or part-time employees

(Castells:1996, 264). Again, the traditional form of work based on full-time employment,

clear-cut occupational assignments and a career pattern over the lifecycle is being slowly

dismantled in the network society (ibid, 268). At the core of these new 'network'

enterprises is the suppression of time, where all efforts at increasing productivity through

outsourcing, etc. boils down to shortening the time needed to perform certain operations,

and speed up the turnover of resources (eg. Just-in-time inventory management)

(Castells:1996, 437). Skilled labor is now required to manage their own time in a flexible

manner, sometimes working more, sometimes less depending on the projects set forth for

them by the companies they work for (ibid).

Work has long been the primary means by which people structure and act upon their

expectations of themselves and others (Smucker: 1980, 280). In the past three decades

since the dawn of the informational age however, there has been an increasing

diversification of working time and working schedules reflecting the trend toward the

disaggregation of labor in the work process (Castells: 1996, 441). With this, between one

quarter to one third of the employed populations of major industrialized countries do not

follow the classic pattern of a full-time job with regular working hours (ibid, 442).

Instead, they find themselves with variable job assignments, and heading towards flex-

time schedules, which generally mean an increase in workload (ibid). The network

society is in turn characterized by the breaking down of the rhythms associated with

notions of a life-cycle (ibid, 446). The work processes of these new companies are

increasingly individualized, where the new division of labor is based on the attributes and

capacities of each worker, rather than on the organization of the particular task at hand

(Castells: 1996, 471). In the network society, labor loses its collective identity and

instead becomes individualized in its capacities, in its working conditions and its interests

and projects.

As Sennett (1998) postulates – through most of human history, people have had to live

with uncertainty, and have accepted that their lives would shift suddenly due to wars,

natural disasters and a myriad of conditions that fall outside the scope of their control.

The difference today, is that uncertainty hangs over society without the guise of disaster,

and with this, a sense of no 'long-term' in our work lives loosens the bonds of trust and

commitment in our behavior that existed to a greater degree between employer and

employee in the past (Sennett:1998, 31). The flexible behavior required by the network

society, can be seen as weakening personal character, as people are faced with the

discontinuous reinvention of institutions, the flexible specialization of production, and a

concentration without centralization of power (ibid, 47).

Social bonds according to Sennett (1998), arise from a sense of mutual dependence,

while the attack on rigid bureaucratic hierarchy is meant to free people structurally from

dependence, and risk-taking is meant to stimulate self-assertion rather than submission to

what is given – with the modern corporation, there is no honorable place for long-term

service (1998:139). However, as Sennett also postulates, this is at odds with the fact that

a healthily self-reliant person is capable of depending on others when occasion demands,

and knows on whom they can depend – even the self-employed are still dependent on

someone for their past, current and next jobs (ibid, 141). This shame about dependence

that has become prevalent in the network society, has practical consequences – as

mentioned before, it erodes mutual trust and commitment, and as a consequence –

personal character (ibid). Trust is an important factor for any organization, and has

seemingly been lost in the new network society and network organization, where the

bond of trust develops as people learn on whom they can depend (Sennett:1998, 141).

The new methods of flexible production, downsizing and outsourcing leave employees

with little chance to develop these types of trust structures among them. With this, as

people spend shorter and shorter amounts of time in a particular work environment due to

flexible production, the bonds of trust are not allowed to blossom into a sense of

community in the workplace (Sennett:1998, 143). When there is no sense of need for the

employee from the corporation, there radiates a sense of indifference and

disconnectedness – where people are disposable, because the system itself is less starkly

laid out for them, and where networks and teams weaken character as the 'other' is

missing from the equation (Sennett:1998, 146). With this, the problem of character is

that there is history, but no shared narrative of difficulty and so no shared sense of fate

among the employees of the network organization (Sennett:1998, 147).

The short amount of time spent in any one, work environment by high-tech professionals,

further distances the corporation from the employee. This sentiment of crushed

community, is further echoed by Freeman in her discussion of female data-entry workers

in the Caribbean, and the open-concept work environment as a means of surveillance and

control (2000). Like the high-tech professionals I interviewed, the women of Freeman's

study also found themselves in open offices, sitting in clustered computer stations with

the clicking of keys, and listening to their walk-mans in an effort to "zone-out", as their

productivity was being constantly monitored (Freeman: 2000,1). Not unlike the high-

tech professionals I interviewed, and the individualization of work postulated by Castells,

Freeman discovered an atomized, individual nature to computer work, in which key

players are physically divided from each other at cellular stations (ibid, 199). With this,

the open-concept office also achieved a double layer of surveillance – the level of

monitoring using the computer, and another layer of human supervision (Freeman:2000,

199). In a similar sense, the open-concept office discourages informal social connections

in the work place because all interactions can be observed, in which case, social relations are more likely to be disconnected.

With this, the fragmentation of the big institutions have left many people's personal lives fragmented as family life is disoriented by the demands of work, when people feel as though they must keep moving rather than settling (Sennett: 2006, 2). This is also true of high-tech professionals, who find themselves constantly pushing their skill base, salary base, and stature within the network structure of the various high-tech companies at an ever-increasing rate. In order to prosper in the unstable, fragmentary social conditions of the network society, individuals must overcome three challenges (Sennett: 2006, 3-5):

1. **Time** – how to manage short-term relationships and oneself while migrating from task to task, job to job, place to place;

2. **Talent** – how to develop new skills, how to mine potential abilities as realities shift – where the shelf life of many skills is short, and a system of meritocracy in place in network organizations celebrating potential ability rather than past achievement. And;

3. **Surrender** – how to let go of the past, where no one owns their place in the organization despite positive past performances.

Despite companies looking for this 'ideal' network-able employee, most people are not like this, needing a sustaining life narrative which includes a pride at being good at something specific and values past experiences (ibid, 5). The cultural ideal that is required by the new 'network' organizations, thus 'damages' many people who inhibit

these organizations (ibid, 5). Constructed as such, the network organizations inspire only weak loyalty from their employees, and breed low levels of trust, but high levels of anxiety about uselessness among their employees (ibid, 181). The increasingly shortened time framework within which we are forced to bring products to market in the network society, has disoriented individuals efforts to plan their life course strategically, where there is no longer a delayed gratification attached to work or a clear plan for where work-lives will lead (ibid). What is lacking in today's networked organizations, is an emotional and mental anchor – employees of any type need values which assess whether changes in work, privilege and power are worthwhile – they need a culture to bind them (Sennett:2006, 183).

High-tech professionals like many other jobs in network organizations, are subject to new institutional constraints of insecurity, where they frequently succumb to the feeling that they have no narrative agency in the culture of an organization as layers of bureaucracy – they lack the power to interpret what is happening to them without these cultural constructs (Sennett:2006, 188). With this, Sennett proposes that there is a necessity for employees to feel useful, as feeling useful means contributing something that matters to other people, and in order to legitimize their work, people need to be publicly recognized (ibid, 190). Lastly, the value of craftsmanship is lacking in the cultures of network organizations – the desire to do something well for its own sake, which when it actually occurs, leads to a heightened sense of commitment to the organization (ibid, 195). The question then becomes, for the network organization's employees – how do you commit

to an institution that won't commit to you? This leads to the question of what is the

social context of doing business? Should our aims now become a question of making

these 'network organizations' into better citizens of nations and the world starting with

one node (employee) at a time?

2.2   Organizational and Corporate Ethnography

The exploration of the concepts of organizational and corporate ethnography are also

theoretically important to the course of this thesis, in that the cultures of the 'network'

organizations discussed before, are all unique in their own rights, and understanding the

underlying principles of what makes them 'tick', can cast further light onto the debate of

the network society and its reorganization of work.

As is the case with any study in anthropology, the anthropologist's portrayal of the

culture being observed is inevitably influenced in some way or another by their own life

experiences. While each ethnographer may claim interpretive authority, each of these

reports is limited insofar that it derives from what is a partial perspective of the cultures

being studied (Rosen: 2000, 41). Accordingly, these perspectives are mediated by

experiences in and out of the field as a product of the time and the context in which

fieldwork was conducted, analyzed and written (ibid). In my case, my initial concepts of

'organizational and corporate culture' were shaped by having completed a business

degree before beginning my studies in anthropology.

While in business school, the particular major I chose can be considered as having

anthropological leanings to its make up – I had to choose a particular region of the world

that I wanted to study (Western Europe), then choose a language to learn from this region

(German), and then took classes on both the culture and the history of Germany.

However, the vast majority of my learning about the constructs of culture during this

degree, were found in International Business, Human Resources and Organizational

Behavior texts.

It is therefore important for anyone reading this study to understand that my

understandings of organizational and corporate ethnography are inevitably shaped by this

business background. As will be explored in the following sections, I try to separate the

concepts that have been learned through being a student of business, and a student of

anthropology.

2.2.1 Management's use of the terms 'Organizational and Corporate Culture'

'Corporate or organizational cultures' in recent years have become catch-all phrases

influencing not only the on-goings of corporations themselves, but more importantly, the

behaviors of their employees. The discussion which ensues, in this section is an

exploration in the differences surrounding the use of the term 'corporate and

organizational' cultures in respectively management and anthropological literatures.

While the term 'corporate culture' is widely accepted within the field of business as the development within organizations of distinctive sets of emotional, collectively held beliefs that impel members of these organizations to act in certain ways (Trice 1993; Gellner et al. 2001) – this image differs within the field of anthropology, as will be discussed later. From a management perspective, these concepts of culture are taken as ideologies – but similar to the study of anthropology, these ideologies are often expressed through "...symbols, ceremonies, myths, rituals, special languages, sagas, taboos and rites."(Trice 1993, xi). However, the term "ideology" assumes manipulation or at least support of those in power. Thus one can point to "management ideology", attempts by management to foster identity with the objectives of the firm. In the case of "culture" this emphasis came as middle management was being reduced. The idea, as characterized by work teams, for example, was to foster a climate of unity and trust so that workers would take on greater responsibility for the good of the company in the absence of foremen and middle management (Bendix:1974; Smucker: 1980, 1988).

Again differing from the study of anthropology, most scientific and human resources analyses of work are based on limited, rational models of work which assume that jobs equal formal titles; that work can be summarized by job descriptions, and careers consist of a series of formal job transitions, salary increases, and changes of employer (Gregory-Huddleston 1994; Gellner et al. 2001: 4). These terms persist in business studies, because such comparisons of titles, job descriptions and careers are important in our

society, helping us navigate the complexities and subtleties of our actual working

environments.

In Organizational Behavior (OB) literature, organizational culture is commonly seen as a

tool, to further order the work lives of the employees of an organization, acting as one of

the main drivers of employee commitment and engagement (McShane: 2004, 454). The

analogy most often used in OB literature is of the elements of organizational culture as an

iceberg – where the artifacts of organizational culture consisting of the physical

structures, language, rituals and ceremonies, as well as stories and legends, rest above the

water; and below the surface lies the organizational culture itself that consists of beliefs,

values and assumptions (ibid, 455). Similar to the discussion of Sennett's theories of

community, commitment and loyalty above, McShane suggests that corporate culture

serves three important functions: (1) it is a deeply embedded form of social control that

influences employee decisions and behavior; (2) it is the 'social glue' that bonds people

together and makes them feel part of the organizational 'experience'; and (3) it assists

the sense-making process, helping employees understand organizational events (ibid,

461). Echoing the structures at place in the 'network' organizations described before, it

would seem that management's view of organizational culture is that it can be

deconstructed and reconstructed at will (as is often the case when mergers or acquisitions

occur), in order to reshape employee perspective of the company (ibid, 465-471).

Countering this approach has been a long tradition of ethnographies describing

subcultures of workers (the reputation of "the Chicago School of sociology was built on

these ethnographies) and the ways in which they control production and achieve their

own objectives often in conflict with those of management. These studies demonstrate

that workers seldom equate the formal organization with how the work process actually

gets carried out (Hughes:1958; Whyte:1961; Edwards:1979; Hamper:1986, 1987, 1988,

1991).

With respect to the study of organizational cultures within anthropology, a more holistic

approach is adopted, helping managers to see a more symbiotic relationship between

corporate culture and its larger culture (Hamada 1994; Reynolds 1994; Wright 1994;

Ouroussoff 2001). Anthropological studies of cultures in general, offer a more

interpretative approach through which to understand organizations as sites for

constructing meaning (Wright 1994:3). In this sense, culture is a framework for

interpretation and cannot be consciously created or constructed (although many managers

would like it if this were so), because these systems of values and beliefs are shaped by

experience, tradition, class position and political circumstance (Reynolds 1994: 302;

Wright 1994: 26). With this, it can be postulated that the current image of 'culture' held

by corporations, where a single corporate culture can characterize all levels of an

organization is both naïve and undesirable (Hamada 1994; Reynolds 1994; Marcus 1998).

This belief permeates business literature, because the ultimate goal of any culture that is

constructed by an organization is to act as a means of informal and formal control over those working for the organization.

Generally speaking the differences between the views of management and anthropology lies in that, the manager wants to understand organizational culture because they "...want to make the organization more efficient or productive, while the anthropologist is [driven] to understand the dynamics of comparative human behavior, social, cultural, and economic change."(Hamada 1994: 265)

2.1.2 Organizational and Corporate Ethnographies as seen by Anthropology

Whether it exists in a nomadic village or a huge multinational corporation, 'real' culture develops socially, much of it being shared among those who interact, but also through individuals who have their own unique collections of culture that reflect the history of their social experiences across numerous settings (Hamada:1994, 265). When studying organizational culture then, the anthropologist has many options of approach, seeing culture as an external variable, as informal organization, or as both a system for formal and informal organization (Schwartzman 1993:33-35), which are but a few of the possible routes for study. Unlike management representations of corporate culture, the work of organizational ethnography within anthropology and sociology is a question of debating cultural process, and is not simply a matter of choosing from a menu of characteristics to describe culture, but of debating the efficacy and appropriateness of different frameworks of analysis.

The study of corporate cultures can be seen as having a long history within the fields of

anthropology and sociology, from the Hawthorne studies in the 1930s to the present day.

In fact, "...social anthropologists in Britain have long carried out, or been connected to,

studies of organizations, even though those studies have rarely been acknowledged as

part of the history of the discipline"(Gellner et al. 2001: 3). With respect to these early

studies at Hawthorne conducted by Warner, the presence of a shared culture among

employees in the bank-wiring room was revealed – a culture heavily rooted in ideas about

fairness, a living wage and a right to work. Direct observation was needed in order to

sort out the complex cultural processes involved, where a rich informal culture was found

to exist in the work place that ended up exerting considerable influences on productivity

(Hodson, 1998). It should be noted that all of the experimental variables that were

introduced to the selected group of women had no effect on their output. From these

failures it was surmised that what produced their greater productivity was (a) the fact that

the women subjects were carefully selected for their cooperativeness and (b) they were

made to feel "special" and thus sought to win favour from Mayo and his fellow

researchers (Smucker:1980). It was more the case that the researchers created an elite

group to be studied and because it was thought that they treated the workers differently

the entire "Human Relations" movement in management literature was fostered (ibid).

The conclusion of the Hawthorne studies is a point that while not tested, would seem to

ring true for anyone's work environment – if workers are made to feel really special, they

will perform much better than if management assumes that financial rewards are all that

matters. Unfortunately, the realities of the network structure of work today would seem

to uphold this notion that only money matters.

Another perspective on management ideology, can be found in Bendix's *Work and*

Authority in Industry (1974). Bendix's interests lay with the notion that management

ideologies seek to justify the subordination of large masses of workers to the discipline of

factory work and to the authority of employers (1974, ix). With this, ideas concerning

work and the authority structures attached to it, are important as they reflect and affect

the relations into which workers enter in order to make a living – whereby these ideas

touch upon the lives of everyone, upon our freedoms and our well-being (ibid). As

would seem to be the case in the network society – no social bond exists between

employers and those employed, so that when individuals join organizations, they must

then leave their divergent interests behind and abide by the obligations that become theirs

upon entry – where any pursuit of private ends becomes a token of disloyalty (ibid, xxiii).

Authority within the structures of bureaucracy has a clear-cut meaning as long as few are

in control (ibid, 435). However, authority becomes ambiguous when faced with the

realities of the network society, where the use of 'expertise' in the management of

companies increases, and managerial functions become sub-divided and specialized

(ibid). In this sense, the ideologies of management may be considered indexes of the

flexibility or rigidity with which the dominant groups within a company meet the

challenges from below them (ibid, 441).

This is not unlike the managers studied by Jackall in his book *Moral Mazes* (1988), who

found themselves coping with the changing realities of bureaucratic structure and in turn

this affected their morals both in and out of the workplace. Before the rise of the network

society, the ethos spread by corporate leaders was to tell their charges that hard-work

would lead to success – where rewards would directly correlate with efforts (Jackall:

1988, 3). With this, Jackall contends that the nature of bureaucratic work can shape

people's consciousness – regularizing people's experiences, rountinizing their lives,

exposing them on a daily basis to constructs of authority, helping them to set goals, and

helping them to structure where they 'fit' in their work organizations as a product of

bureaucratic hierarchies (ibid, 6). The danger as mentioned before however, in this type

of rigid cultural and organizational structure, is that bureaucratic work causes people to

push aside while at work, the moralities that they might hold outside the workplace or

privately, in order to follow the prevailing morality of their particular organizational

situation (ibid). These were the particular conditions and confines that the rise of the

network society as mentioned by Sennett, was supposed to cast aside – leaving people

more 'freedom' to shape their own lives. Just like previous forms of hierarchical

bureaucracy however, the nodal networks of the corporation today make their own

internal rules and social contexts – the difference however, lies with the much quicker

rate of change that these new networked organizations can effect on these rules and

contexts – leaving employees scrambling and searching for some form of moral structure

by which they can structure their work lives. The danger with being nodes in the

network, rather than steps in a pyramid – is that there is no firm mortar that joins the

nodes to one another.

In Rosen's *Turning Worlds, Spinning Worlds*, he discusses organizational ethnography in

terms of the people of an organization who, he would contend, are organized about a

recognized set of goals (2000, 44). These organizations maybe seen as complex, but not

in the same sense that complex society is complex – because these formal organizations

within companies are both partial (not a whole society) and specialized (organized for a

specific objective or set of objectives)(ibid). Not unlike the network organizations

discussed at the outset of this chapter, Rosen furthers this statement by saying that all

relationships within the corporation, are rationalized in terms of the end product or

products, and everyone within such organizations has a formal explicit status and role,

interacting with others based on these statuses (ibid) – although as demonstrated earlier,

the employees of a network organization, often find themselves without the clear role and

task definitions seen in the past under more hierarchical organizational structures. With

this, Rosen suggests that the longer people interact with each other within the formalized

space of the organization, the more outside social awareness seeps back into

organizational relations (ibid). This becomes interesting in reference to the techniques

used by the high-tech professionals I interviewed for coping with the uncertainties of

their industry – where there was a strong association of the identities of the high-tech

professionals with their 'free-time' activities versus their 'work-time' activities. Related

to this, Rosen also brings up the analogy of an inside/outside dichotomy attached to the

work environment (2000, 44).

Another interesting aspect brought up by Rosen is that organizational ethnography at its

roots, is a method interested in uncovering and explaining the ways in which people in

particular work settings come to understand, account for, take action, and otherwise

manage their day-to-day work situations – it is an act of sense-making, of studying

systems of meaning (2000,54). This view is of particular interest for my analysis of the

culture of high-tech professionals, as it relates to how the high-tech professionals

interviewed defined the organizations they worked for, coped with the uncertainty of the

industry, and constructed their professional identities.

Bate, in his article *Whatever Happened to Organizational Ethnography*, also brings up

new pieces to the organizational culture puzzle. Like Rosen, Bates reiterates that

organizations have processual cultures that are 'formal' in the sense that they have

explicit tasks to accomplish and 'informal' in the sense that its members continually

negotiate with one another in the interpretation and carrying out of these explicit tasks

(Bates, 1997). With this, Bates suggests that the emphasis in anthropological studies lies

mostly with the 'informal', but that the focus of organizational ethnography should be on

the contested terrain between the formal and informal, upon how different subcultures or

native view paradigms negotiate the terms of their co-existence, collaboration and

interdependence (ibid). In the case of the high-tech professional, it would seem that the

formal structures of the companies influence the professionals in how they approach their

work, but as products of the network society, little of the informal culture of the

professionals can shape how these companies conduct business.

Also linked to the concept of the network society, is a point of interest brought up by

Rosner, as he interviewed anthropologist Karen Stephensen. Stephensen contends that

organizations have a large number of informal leaders who control the ways in which

information is exchanged, because of the need to negotiate four kinds of networks within

any organization, namely social networks, work networks, the innovation network, and

the expert network – all similar to the networks reverberated by Castell, Sassen, and

Sennett. In order to negotiate these networks, each network would seem to have a series

of informal leaders that control the flows of information (ibid). While formal

organizational charts give the anthropologist an indication of what the baseline is or what

the legacy of the company is, people in the organization will always deviate from this,

but the networks involved may not change, leaving work to be done in the same way as

before despite organizational restructuring (ibid).

In his article on *Anthropological Praxis*, Hamada suggests that there exist three

contemporary models used by management to analyze business organizations, namely:

(1) culture as integration; (2) culture as differentiation; and (3) culture as fragmentation

(Hamada: 1999, 79). In contrast, Hamada views organizational culture as a process of

creating meanings and practices in webs of agency and power that are relational,

historically situated, shifting and incomplete (ibid). With this, he stipulates that

anthropology tends to believe that organizations do not have a culture for management to

manipulate, and that organizations can be analyzed in terms of expressive, ideational, and

symbolic aspects (ibid, 94).

Rosen also brings up the question of who the organizational ethnographer chooses to

study, stating that they largely study people like themselves, conducting what he terms

'auto-ethnography' or the study of one's own people (2000, 45). This finding, is not

unlike Hannerz's study of Foreign Correspondents, where he devises the term 'studying

sideways', rather than the techniques of 'studying up' or 'studying down' the

organizational structure (2004, 3). According to Hannerz, studying sideways is not a

matter of power or rank, but engaging with a type of work that is parallel to the

anthropologist – where studying others of the same 'status' is a way of reflecting on

one's own condition and one's own reflexivity (ibid). This is relevant to my study of

high-tech professionals in the sense that I too am a citizen of the network society

discussed at the beginning of this chapter, and as a consequence, the experiences of the

high-tech professional as they negotiate the network organizations that they work for, are

expressions of how everyone can learn to cope with these new economic realities.

2.3 'Networked' Studies

In my own research, the central factors dictating occupational culture were based on the

shared profession of workers in high-tech performing tasks of software or hardware

development, and a shared educational background in either computer science or

computer engineering.

One theory on occupational cultures is presented by Trice (1993), where he has

discovered that occupational cultures often attempt to embrace and even create a culture

for themselves, which can differ from the values of the corporation. In this sense,

occupations tend to become cultures in and of themselves (Trice 1993; Gellner et al.

2001). This translates to the topic of networking in which all of the professionals

interviewed recognized the importance of renewing and building relationships with their

colleagues within the field (in the companies they currently worked for and other

companies), as a protective measure should they ever be in search of work at a later date.

When looking at the work processes involved in high-tech work, the concept of a shared

professional culture is echoed in Kunda's study of engineers in a high-tech firm. Similar

to the inner workings of the network organization described above, the organizational

structure of the company Kunda studied ('Tech') was left purposefully under defined –

making it informal, uncertain, and flexible (1992). With this, Kunda suggests that culture

is not a product of a random process but is managed purposefully, where much energy is

invested in embedding the rules, prescriptions, and cautions of the culture into the fabric

of everyday life at 'Tech', where culture provides for an underdeveloped organizational

structure (1992, 218). With this, an incorporation of collective values is required,

whereby membership to the company community comes from incorporating 'Tech's'

values of "...excitement, fun, making work challenging, any contribution important,

pride and hardwork..."(ibid, 64). As mentioned before, one of Sennett's theories about

work in the network society, is that for employees to be thoroughly effective, there is a

necessity for employees to feel useful, and feeling useful means contributing something

that matters to other people – in order to legitimize their work, people need to be publicly

recognized (2006, 190) As Kunda explores the work lives of the engineers at 'Tech', he

found that the strong and formal methods of organizational socialization used by 'Tech'

when employees entered the firm left employees to act in the company's best interests,

not because of economic rewards, but because they were motivated by the satisfaction

they drew from their work and an identification with the company's goals (1992, 173-

174). These feelings of belonging and motivation, were compounded by the job security

'Tech' offered its employees versus other companies (ibid, 174). As Kunda's study was

conducted before the dot-com bubble burst, one wonders if 'Tech' continues to offer its

employees the same type of job security it did at the time of study.

However, the pride and self-motivation Kunda's respondents felt towards their work was

also echoed by the professionals I interviewed representing itself as an internalization of

the belief that a high-tech professional should be innovative. High-tech professionals are

able to manipulate technology to their whims – creating and synthesizing in order to offer

customers an exponentially growing range of products. In this sense, the companies that

they work for become dependent to a certain degree on the experience of their

professionals, much like the dependence the network organization has on the reputations

and expertise of the producer services they employ. Many of these high-tech

professionals are in fact engineers, offering them not only a professional designation, but

also the use of professional associations not connected to their place of work –

professional networks, as part of the professional culture.

Like the study just outlined by Kunda, there is an expanding literature in anthropology

and sociology outlining the many dimensions of work and identity attached to the high-

tech work place. In one such study, Peterson, Saporta, and Seidel (2000) explore the

question of hiring practices in high-tech. Returning yet again to the concepts of the

network society, and the reorganization of work it has spawned, Peterson, Saporta, and

Seidel (2000) discovered that there is great importance placed on the use of 'networking'

in hiring practices of high-tech industry. These networks may take many forms, but their

primary function is to provide information about opportunities to job seekers and about

prospective hirees to employers (ibid, 769). While these finding do not seem particularly

distinctive, they are interesting in that they tie together the theories of both personal and

organizational networking expressed by Castells and Sennett earlier, and pertain

particularly to this phenomena as it exists in high-tech firms. In particular, this study of

a mid-sized high-tech firm showed that, personal and professional networks accounted

for 60.4% of applicants, and 80.8% of those receiving offers (ibid, 810). This is

interesting in respect to the section on job-hopping in my chapter on identity and career,

as all of those interviewed expressed one or another form of social and professional

networks that they would fall back upon when 'eventually' searching for a job.

In another such study pertaining particularly to high-tech, Gregory-Huddleston found

there to be "...a clearly patterned conceptual landscape of options and

considerations...culturally shared among technical professionals"(1994: 122). Her focus

again relating to the concept of the network organization, was on how organizational life-

cycles interact with individuals' work and careers and the resulting conflicts that arise. In

the case of many high-tech firms, teams of entrepreneurs founded small start-up

companies because they were attracted to the intimacy and 'power' possibilities of a

small firm. This is not dissimilar to the growth and expansion of the producer services

mentioned above. Often, this exponential success and growth led to a change in the

company's culture and status. The company was no longer a small, decentralized firm,

having instead morphed into a larger company that did not support or reward

entrepreneurism as well as the initial start-up did (Gregory-Huddleston 1994). In this

sense, the larger company does not breed the same type of risk-takers, and new

employees joined the firm with job security in mind. Gregory-Huddleston defines this

tendency as the cultural conflict between *pioneers* (entrepreneurial individuals who

explore uncharted territory) and the *settlers* (who come later from other 'settled' places

once the territory is more civilized) (1994,122). Essentially, this type of pattern has

emerged within 'high-tech' companies as a result of the two types of companies within

the industry, whereby employees distinguish between large or small, and relatively

'stable' or rapidly growing companies (Gregory-Huddleston 1994:124). Most high-tech

professionals tend to start-off at large companies in order to gain technical experience,

and then try to find work at 'growth' companies later on because they offer greater

chances of being pushed up the 'ladder' quickly (ibid:125). Problems arise however,

when these smaller start-ups become larger corporations. Much of the entrepreneurial

spirit that was so valued in the past, works to the detriment of efficiency – leaving many

'pioneers' in the position of wanting to leave to start-up new ventures, but un-able to, due

to the 'golden handcuffs' of stock options to be redeemed at some future date (ibid,129).

Of particular interest in Reynolds' study of a high-tech firm in Silicon Valley, was the

'natives' definition of corporate culture as a product of meetings between the president,

vice-president and a management-consulting firm to 'come up with' the company's

culture. This is not unlike Kunda's findings mentioned before suggesting that culture is

not a product of a random process but is managed purposefully, where much energy is

invested in embedding the rules, prescriptions, and cautions of the culture into the fabric

of everyday life at the company, where culture compensates for a weak organizational

structure (1992, 218). In Reynold's case of the meeting of higher-ups and management

expertise services, a two page document describing the company's culture was eventually

issued, detailing attitudes towards customers and colleagues, the style of communication,

the chain of decision-making, and the working environment that the company wanted to

create (Reynolds 1994: 303). However, disparities between this document and what was

actually occurring within the firm began to appear: an image of success, productivity and

quality was emitted to the outside world, even while more and more products were found

to be defective. One example of this, was the practice of shipping products off to

customers even when they were known to be defective in order to give the impression of

manufacturing efficiency (Reynolds 1994). Sennett's concept of 'flexible specialization'

seems again applicable here, as companies try to get more varied products ever more

quickly to market (1998, 51). In Reynold's study, despite a description of 'open-

communication', strict codes of conduct and chains of command were upheld concerning

decision-making and the dissemination of information. It would seem that it is not

uncommon for companies to follow this route of a written corporate culture when trying

to market their company to both prospective clients and employees – of particular interest

to my research, is the continual motivation in high-tech to push out products at a

startlingly fast rate. As mentioned before, the evolution of the network society is based

on increasing one's access to information through technology – with this in mind, it is not

surprising that Reynold's subjects were willing to sell unfinished products. With such

highly complex organizational structures based on networks between companies,

networks within companies, personal networks and computer networks (Castells: 1996,

165-166) in place; any break in a link along the nodal chain, can spell disaster for the

'networked' company.

As English-Lueck states, anthropology is concerned with the mundane – the details of

daily life and what the small actions and interactions teach us about the human condition

(2002, 9). In this sense, she chose to study the community in which she worked and lived

– Silicon Valley – and found that life there was also shaped by the network society, and

the technological saturation aspired to in the information age. The people of Silicon

Valley tend to organize their lives around networks, family, and work organizations,

embracing technologies for many purposes and results, reinforcing existing values and

shaping new ones (ibid, 11). With this, English-Lueck stipulates that high-tech work is

distinctive where much of it is knowledge work – receiving, manipulating and passing

along bits of information through an often transnational, interdependent network of

fellow workers (ibid, 23).

As mentioned by those that I interviewed, high-tech work involves creativity – often a

great deal of it, and is not easily made rote (English-Lueck: 2002, 23). In turn, it is not

easy to tell by observation if someone is working, as creative work is notoriously hard to

monitor, so people make a great show of working – individuals and teams demonstrate

their dedication through working long hours and continuing discussions of work

problems (ibid, 23). With this, technological devices allow people to shape their work to

fit immediate needs – planning ahead gives way to Just-in-Time solutions, and

technology makes it possible to develop one's schedule ad hoc as the day's events unfold,

maximizing personal flexibility (ibid, 31). The production of technology becomes a

moral mission, reflecting a technologically inspired vision of progress (ibid, 37).

Also echoing Sennett, Castells and Sassen, English –Lueck found high-tech industries to

be amongst the most volatile sectors of the economy – when the sector expands, it booms

but it can fail catastrophically – and in this case, it is a vulnerable basis for which a sense

of 'community' can develop (English-Lueck: 2002, 177). In this sense, it is networks

that provide the real social web that prevents free-fall and those networks must be sustained by personal contact (ibid, 76). Life in the high-tech world of Silicon Valley is imbued with a pervasiveness of technological metaphors in daily and civic life that elevates 'efficiency', 'innovation', and 'invention' to the paramount virtues (ibid, 178). And while the ethos of cultural flexibility may encourage creativity, her informants also expressed worry about the ability to make meaningful connections or in sustaining a 'deep' sense of belonging, where home can no longer be treated as sacred, as technology allows work to permeate life (ibid, 178).

In another study conducted jointly with Saveri, English-Lueck again explores the worlds of the high-tech worker (2001). Through their research and echoing the theories discussed above by Sassen, Castells and Sennett about network society, they discovered that high-tech knowledge work is not a concrete or simple phenomena, but one fraught with uncertainty and ambiguity (ibid, 7). Some uncertainty it would seem is built into the creative and communicative process of work, where high-tech knowledge work requires the intellectual flexibility that is characteristic of the network age, and where inherent innovation in creating new products makes it problematic to standardize work practices (ibid, 8). As I discovered in my own interviews with high-tech professionals, uncertainties and ambiguities in their work leads high-tech professionals to create elaborate accounts of who they are and what they do, and in turn technologies become deeply intertwined with these identities (ibid, 11-12). As most of those I interviewed identified with terms such as coders, managers, teachers, geeks and people-people to

describe who they were in the work place, they also valued very highly a stable structure

to their personal lives in order to cope with the uncertainties and ambiguities faced in the

workplace.

Compounding the networked reality of today, is that an increasing amount of high-tech

professionals are working on short-term contracts as consultants and are in effect

receiving little in the way of commitment from their employers beyond their paycheques

(Amit, 2002). As Amit postulates, there are dangers hiding beneath the glamour of high-

pay, travel, and prestige associated with particular occupations and the appropriation of

the 'consultant' label (2002, 150) that so many high-tech professionals aspire to. The

main question then becomes when looking at consultancy and travel as the 'modern'

career, whether these consultants have simply adapted to the change in the nature of

employment better than people in other industries (ibid, 152)? Not unlike the mindsets of

the high-tech professionals that I interviewed, there seems to be a common orientation

that underpins the different career choices of consultants – "...a vision of career that is

shaped around mobility and a willingness, even insistence to maintain a level of social

disengagement that will enable frequent moves between firms, projects, colleagues and

places" (ibid, 154). With this, Amit also found (similar to Sennett's comments on trust

and commitment), that there existed an inherent insecurity among the Cayman ex-pats

she interviewed, as to the contractual nature of jobs available to ex-pats, leaving them to

feel that they were just 'guests in another land' (ibid, 156). The corporations these ex-pat

consultants worked for '...want you until they've used up what you've got and then they

just replace you and you're discarded'(ibid). In this sense Amit suggests that, the

interpretation of 'flexibility' as the interaction of agency with mobility and expertise does

not necessarily connote acceptance of chronic insecurity (ibid, 158). This study is similar

to the sentiment of many of those people I interviewed, where they would erect network

mechanisms in order to guard themselves against these same types of security.

2.4 Linking the nodes in the network

But why examine the reorganization and constructs of work in the last three decades, and

how does this affect the study at hand about high-tech professionals in the Montreal area?

First and foremost, the discussion of the reorganization of work has shown that work and

power are now based on information accumulation, and how to act as quickly as possible

on the information received in order to get products to market at an ever-quickening pace.

As the quick exchange of information became possible due to improvements in

communication and other technologies – there arose a new form of organizational

structure – one based on a series of interconnected networks, rather than pyramidal

hierarchies, removing layers of middle-management and production that were no longer

needed – outsourcing these 'un-needed' skills elsewhere. These middle-management

tasks were then shifted to a new development in industry – the 'producer services', or

hired-in experts. It is in the development of the network society and the producer

services that the first connection lies to the high-tech professionals that I interviewed.

As most of those I interviewed ranged in age from their mid-twenties to just under forty, the entirety of their work lives could be seen as being shaped by the rise of the network society, and have been spent within the structures of some form or another of a network organization. They have become used to constant fluctuations in the high-tech economy, where the threat of job-insecurity was compounded by the dot-com crash. Even the scope of their jobs has been shaped by the network society, where their training and work mobility habits more closely resemble those employed in the (other) specialized service sector (producer services), than the assembly line workers of the old Fordist era.

The new organizational structure of the network organization was not without its faults however. As Castells discusses, there arose an individualization of work, where employees were now expected to be just as flexible as the nodal networks of the corporation – able to function as entities unto themselves with less guidance than in the traditional sense of the pyramidal enterprise. In fact, the need for guidance and dependence on others became a weakness of sorts. In this sense, the high-tech professionals I interviewed, are also faced with a lack of guidance on how to complete their jobs – where success is decreed so long as their projects were executed on time, and in a functional manner. The network organization and its constant removal and addition of nodes to its systems, has also left the high-tech professional in a state of flux as to the regularity and dependability of full-time work. As Sennett has postulated, this has left employees, of the network organization and high-tech little loyalty and commitment towards their employers, as these traits are not reciprocated by the organization.

As the business of the industry of high-tech is technological evolution and innovation

itself, the sector reflects the incorporation of the flexible value system of the network

society and the dangers of this society at a quicker pace than other industries still attached

to a more 'Fordist' model of the hierarchical corporation. In this sense the ways in which

work touches the lives of the high-tech professional, can be seen as a reflection of what is

to come in the future for other industries making the leap towards networked

organizational structures. The issues facing the high-tech professionals I interviewed in

Montreal are therefore issues facing all of us who work in non-unionized jobs without

tenure – the specter of uncertainty at retaining full-time employment constantly hanging

over our heads. What is interesting in turn, is to see how these 'front-runners' of

technology and the network society deal on a daily basis with the uncertainties attached

to their work, and how in turn this affects their everyday lives. I propose therefore, that

the high-tech professionals that I interviewed are just nodes in the much larger networks

of the network economy and network society – fighting to construct images of

professional culture that will guide them in their professional lives and put them at ease

in their personal lives.

3.0 Methodology

3.1 Fieldwork and the interview process explored

Within the field of anthropology, there exists a barrage of texts discussing

methodologies for conducting research. Methodological topics ranging from how to

initially enter the field, how to approach studying organizations, and to how to write

ethnography are but a few of the topics that were worrisome for me as a neophyte

anthropologist, entering field and writing about my fieldwork for the very first time.

In particular, the question of fieldwork was daunting for me from the outset, but as

will be discussed below in this chapter, it became even more worrisome as the

conditions of my fieldwork changed (see section 3.4 for more elaboration).

3.1.1 Situating the 'Field'

In exploring the literature on anthropological methodologies – the texts of Marcus and

Fischer, Gupta and Ferguson, Hannerz and lastly Okeley – about situating the field,

were of particular inspiration.

Marcus and Fischer suggest that "[e]thnography is a research process in which the

anthropologist closely observes, records, and engages in the daily life of another

culture – an experience labelled as the fieldwork method – and then writes accounts of

this culture, emphasizing descriptive detail."(1999, 18). With this, there is often the

expectation that neophyte anthropologists should be tested by fieldwork, in an effort

to portray a sort of holism – not to make universally valid statements, but to represent

a particular way of life as fully as possible (ibid, 21-22). As such, my research on the

high-tech professionals that I interviewed in the Montreal area does not attempt to

make broad generalizations – it must be taken at face value as being the product of the

views of a small group of professionals on their jobs and how their jobs in turn affect

their lives.

Similarly, Gupta and Ferguson's discussion of "The Field", offers many pertinent

points spanning the practice of anthropology. Fieldwork and its end result –

ethnography – have long been associated with Anthropology as its research method

'par excellence' (Gupta & Ferguson, 1997). With this comes the association of the

'real anthropologist', a researcher following the long traditions of Boas and

Malinowski, an individual capable of leaving all that the developed world offers in

search of knowledge about the 'other', a people from some far-off land whose cultural

practices are seen as different and exotic (ibid). Fieldwork can be seen as the most

significant factor determining whether a piece of research will be accepted as

'anthropological' or not (ibid).

Gupta and Ferguson go on to state, that the field itself is a construction developed by

the anthropologist as they begin their research, continuing to develop and change

throughout the fieldwork and ethnographic process (1997). With this, the word 'field'

often connotes a place set apart from the urban, suggesting a place that is agrarian in

the least, and preferably 'wild', that does not stray too far from nature.(ibid)

However, a 'good' field site is made, not only by considerations of funding and

clearance, but by its suitability for addressing issues and debates that matter to the

discipline (ibid). In light of this, sub-fields (such as legal anthropology, economic

anthropology, etc) have developed, and have helped to shape not only topics of

investigation, but also the conception of the field itself.(ibid) With this, the topic of

the culture of high-tech professionals could be seen as an further exploration into new

constructions of what is the 'field'. Just as Gupta and Ferguson identify the changing

nature of the 'field', in my case, the scope and parameters of my research changed

greatly throughout the research process as will be described below. The research

process was itself a victim of the changing conditions of the network economy and

was bound by the fast-paced high-tech world of those that I interviewed.

With the stigma attached to studying close to home under fire within anthropology,

Gupta and Ferguson see a re-invention of the 'field' as paramount to the practice of

anthropology (1997). Whether abroad or at home, it is the attentiveness to location

that would preserve and build upon aspects of the fieldwork tradition (ibid). In the

case of the culture of high-tech professionals, the location of study resides in the

companies for which the professionals work, as well as within the individuals

themselves.

As reviewed by Gupta and Ferguson, there has traditionally been a tendency within

anthropology of the 'other' being most clearly opposed to a middle-class self (1997);

Hannerz however, offers another model for situating in the field – 'studying

sideways'(2004). As Hannerz discusses, ethnography is often seen as 'studying-up'

or 'studying-down' from this 'middle-class self' (i.e. less powerful and prosperous

than the anthropologist themselves)(ibid). *Studying-sideways* by contrast, involves

studying those who would be considered social or professional counterparts to the

anthropologist, and not as a matter of power or rank, but instead engaging with those

parallel to the anthropologist (ibid). This would seem an important endeavor within

the practice of anthropology, as studying others around us on parallel lines of

profession, is a way of reflecting on our own condition and reflexivity as

anthropologists (ibid). The discussion and study of high-tech professionals discussed

in this thesis, would seem to fall within the scope of studying-sideways – they find

themselves among the same 'western', middle-classes that I, myself as anthropologist,

and office manager of a company belong to. Not only this, but *studying sideways* can

also allow for a more enriching interview experience. The anthropologist who

ventures abroad, learning a new language, and living in a completely foreign culture

has so many other variables to overcome before they can begin to understand the

intricacies of the new culture they are studying. The anthropologist studying

sideways however, goes into their research with commonly shared understandings for

how the society they are studying works (as they are members of it themselves), and

thus experiences a shorter learning curve and socialization to the culture being

studied. This can make for a rich interview process, as comfort levels are higher

between those interviewed and those interviewing, and making trust easier to

establish.

Also linked to situating the field, is the issue of performing fieldwork in what is

considered the anthropologist's 'home country'. As Okeley presents, one of the

concerns not commonly experienced when studying abroad or rather when 'studying-

down', is that the anthropologist studying at home can't escape being read or misread

by interested parties beyond academia (1996). With this, the fieldworker at home

does not have the luxury of splitting identities between home and the country of

research, as the culture of research is found in the home country (ibid).

3.1.2 The Interview Process

When looking at the method of person-centred interviewing, Levy and Hollan present

many issues that the anthropologist must be aware of when using this technique. One

of the main points of contention with basing the majority of one's research as I was

forced to, on interviews, is that interviewing is not (or should not) be mechanical in

nature, but instead is a process which must be felt (Levy & Hollan, 1998). There also

arise problems of distortion and misinterpretation when trying to interpret the

information collected – but with careful self-monitoring during and after the

interview, and guarding against forcing wished for responses, the anthropologist can

overcome these pitfalls (ibid). In regards to my interviews, conversation would often

drift into new and interesting topics that the people being interviewed voiced as

important to them – I took the view that they were the 'experts' and 'authorities' on

the culture of high-tech, and issues of importance for them must be important for

others.

Another important point with reference to my research, was Levy and Hollan's point

that it takes considerable general knowledge about a place and its people before

interviewing *should* commence – in otherwords, a significant amount of participant

observation (1998). In the case of my research, (as will be discussed in the sections of

this chapter on the actual course of research conducted), this poses a problem, as I

was inadvertently forced to jump into interviews earlier than I would have liked in

order to get the project on track as a product of the changing conditions of the nature

of work in high-tech.

As far as the length and number of interviews considered reasonable, Levy and Hollan

would suggests that longer interviews are of preference, as the longer the interview,

the more at ease with the interview process (and interviewer), the person being

interviewed becomes – so long as both parties remain interested in the process.(2004)

With this, they would also postulate that between six to twenty interviews can be seen

as a reasonable number of study.(ibid) In the case of my study, fourteen interviews

were conducted with high-tech professionals, most of which lasted for an hour or

more. This brings up the issue that the scope of this masters thesis is at best an

exploratory study into the small microcosm of high-tech in the Montreal area; and

should in no way be seen as a comprehensive study or portrait of high-tech

professionals.

I used structured interviews for most of the research, but was still able to include

some participant observation, despite the changing conditions of my research as I was

conducting my fieldwork (to be discussed below). The structure of the interviews was

meant to put the person being interviewed at ease with the process and with myself.

Interviewing would begin with basic background questions concerning the person's

place of birth, their childhoods, and their educational background. These questions

were meant to take person being interviewed through the cycles of their lives,

discussing their choices and experiences along the way. The next set of questions

moved into career and what led them to their particular career path. In the same vein

as these questions on career, came questions about the different companies they had

worked for in the scope of their careers. These questions were concerned with what

the companies were like, what was expected of the employees from the company and

vice-versa, what their co-workers were like, their feelings at each company, etc.

Next, came questioning about what their co-workers and friends in high-tech were

like, how they differed or were similar to others within high-tech, and how important

these work and personal relationships were to them. Lastly, they were asked about

high-tech in general – is there a culture to high-tech; where the computer figures into

this culture if there is one, and if there was anything that they thought was important

that was not asked throughout the course of the interview. (For a sample set of basic

questions please see appendix 1)

Although my interviews were structured in order to give a point of comparison for the

later correlation of data, I often probed deeper into subjects brought up by those being

interviewed that were not necessarily a part of my set of questions, but that appeared

important for them to discuss.

Interviews were held in locations that were seen as neutral by those being interviewed

– they would be asked if they had a preference of location, and if not, one would be

determined mutually. Only one of the people interviewed was interviewed at their

work-place – everyone else was interviewed at a location outside of work hours.

Lastly, as is standard ethical practice required by ethics committees and the tri-

cultural code; pseudonyms will be used throughout this study. As far as a sampling

approach, the interviews I conducted were more of a 'snowball' effect as I would ask

people to recommend friends, co-workers and family members to me that they

thought would be interested in helping me out with my research. I began my

interviews with acquaintances who were the initial inspiration for my thesis topic, and

then branched out along their networks for more people to interview. This was the

method used for the men – as all of the men recommended other men. In order to find

some women to interview who worked in high-tech, I had to use my own networks

and sources of other women who knew women working in high-tech.

3.2   Who is the high-tech professional?

When seeking out people to participate in my interviews, I looked for two main

things. The first of these was whether or not they worked in the field of high-tech.

While the term high-tech can encompass many different types of work, for my

purposes, interviewees' jobs had to touch on some form of software or hardware

development. The second of the criteria was their training or educational background.

I tried as much as possible to interview those who had completed university with

degrees in either computer science, or computer engineering.

3.3   Initial plan of action for conducting research

As is the case with any anthropological study, access to the field must be negotiated

with discretion and sensitivity. It is a great privilege for those that we study to show

us even a glimpse of their worlds. With this *Gatekeepers*, as Hammersley and

Atkinson show, become an integral part to any anthropological study. The

gatekeepers find themselves in the position to grant or deny the anthropologist access

to the peoples and cultures they wish to study – therefore knowing who has this power

to grant or deny access is of the greatest importance to the anthropologist. (Hammersley and Atkinson, 1996) With this, the ethnographer must also be aware that gatekeepers are concerned with the picture of the organization or community that the anthropologist wishes to study, and can exercise some degree of surveillance and control over the anthropologist – sometimes shepherding them into specific directions (ibid). In the case of this study, the gatekeepers played an important role in changing the course my research would eventually take.

At the start of my research, I had outlined a plan of action in which to meet and study hi-tech professionals in their organizational environments. The initial parameters consisted of gaining access to 3 different companies that based their business on software engineering. The three companies were all in the Montreal area, and my field research was to begin in the late summer and fall of 2003.

The first of the firms, Company X was a medium sized firm that specialized in information technology security services. They offered not only customized security solutions for high-profile clients such as many of Quebec's financial institutions, but were also a main re-seller for a commonly used firewall/antiviral software for the needs of clients with smaller networks. This company was of particular interest in that 'hi-tech security' is an ever-expanding field. As more companies find themselves with networks to manage; employees working from home; internet banking and other internet transactions to protect – IT security finds itself indispensable and a type of hi-tech which changes at break-neck speed.

My contact managed a group within the company that dealt with specialty solutions for clients. He would often find himself travelling for trade shows, but also to visit clients and develop security systems around their needs. While enjoying the work and travel that his position within the company entailed, he saw that there was no hope in the near future to increase his position or salary. He would have to hope that his supervisor was either promoted to a position that did not exist, or look for another employment opportunity that afforded more responsibilities, prestige, and money. After networking with a few close contacts, my informant was able to gain himself a position with another firm that afforded him everything he was looking for. This said, 'Job-hopping' seems to be an industry-wide practice within high-tech, a trend which will be discussed at length later in this thesis. Unfortunately my contact within Company X fell prey to this trend before I was able to conduct any of my research at this firm. I was then left with but 2 companies to visit.

After informal discussions with my contact at Company Y throughout the course of his company's merger with an American firm, he expressed uneasiness with having me come into the offices at such a tense time. As Company Y was his first 'real' job after university, he was anxious about the possibilities that a merger would entail for him and his co-workers. Managers had been sent up from the head-office in the United States to oversee a 'smooth' transition in the up-coming months. While my contact had experienced a good relationship with his supervisor before the merger, and had spoken to him about my research and visiting the offices, things were now on edge for everyone at the company – no one knew if their jobs were safe.

While most would imagine a culture of hi-tech professionals to be based on innovation and creativity to generate ever-evolving technologies to benefit mankind (and it is to a certain extent) – job security plays a major part in the professional's psyche and well-being. Many of those involved in hi-tech found themselves entering their studies with folktales of engineers and programmers striking it rich as the dot-com bubble approached its peak, only to find themselves with collapsed contracts and signing bonuses after graduation as the bubble burst. This fall from grace and the issues of job security that are connected to it, will of course be discussed later. With this in mind, it is understandable that in an uncertain professional environment, awaiting the true effects of a merger, that my contact at Company Y and his supervisor no longer felt it wise to have me 'enter' the company.

3.4   The actual course of research conducted

This in turn left me with one last option to study hi-tech professionals in an organizational setting. Company Z is a mid-sized company in the Montreal area. The company was founded by two friends who had worked well together on many projects in the past, and decided that there was potential to apply the knowledge they had gained on these projects to other fields. The initial contact for this company had done work for the company as a consultant. Having been in the company for a few months before leaving to pursue his own projects, the contact had found himself on a first-name basis with the founders.

By the time I entered Company Z, almost a year had passed since my contact had been working at their offices. Throughout the course of that year, my contact had had

a chance to meet and greet the founders of the company on numerous social and

business oriented occasions. Their relationship seemed solid, and I was poised to visit

my first high-tech company. The initial visit was interesting, I was given a quick tour

by the woman in charge of their Human Resources and introduced to the few people

who were not 'plugged-into' their computers using head phones. Their offices were

open-concept, meant to encourage the free exchange of ideas among those working

together on projects, and freer insight from those who might not be working on the

same project, but would have ideas/solutions to share. This however, is not often the

case, and the open-concept office will be discussed later.

After two visits, it was evident that other than observing the office set-up and paint

schemes, the employees at the firm were not predisposed to discussions. All of their

energies seemed consumed by meeting ever-shortening deadlines, and stress levels

seemed to be running high. They also seemed to travel quite a bit to visit clients, and

the flex-hours they worked made it difficult to keep track of the people who worked

there let alone the departments they were in. One contact whom I was able to

interview at a later date, stated that the environment was unstable – people were

bounced around from project to project on an almost daily basis, and sent away to

visit clients on a moments notice for undefined amounts of time. To make matters

worse, and cement my decision to exit the environment, my contact's consulting

company was now seen as a direct competitor to Company Z.

The last research strategy used was to initiate the arduous task of conducting

individual interviews. While a tried and true anthropological research method,

interviewing also has its woes. Scheduling interviews with a highly mobile

professional group is not always straightforward. It became rapidly clear that this

particular professional group, often forced to work long and strange hours, placed a

premium on their available personal time. Interviews often had to be rescheduled

over and over again because contacts either had scheduled all of their free-time for

weeks in advance, or were sent away to conferences, trade shows, or to visit clients,

sometimes at the drop of a hat. While the schedules of the interviewees were of

concern, my day-to-day commitments of work and family were also obstacles to

overcome.

Fortunately, I was also able to attend three informal get-togethers, where the vast

majority of attendees were computer science or computer engineering graduates.

While most of the conversations at these three parties were encouraging and insightful

towards my thesis topic, they did not lead to any interviews that came to fruition.

While everyone seemed intrigued by my topic of choice and willing to offer up

contact information, none of them seemed interested at parting with their free-time at

a later date. Despite this, I was able to conduct fourteen interviews, with people from

very different branches of high-tech, leaving me with a wide perspective of the

organizational environments within high-tech and the people that chose to work

within this evolving industry.

3.5   The challenges of the anthropologist at home

Since beginning to research this topic, I have genuinely come to understand the

complexities involved with conducting field research at home. It is inevitable that the

day-to-day intricacies of life interfere with the scope and extent to which research is

conducted. Since the beginning of my research in the late summer/fall of 2003, I've

gotten married, my husband lost his job and founded his own company, to supplement

the ups and downs of a new business, I took a full-time job as an office manager of a

small company, as well as taking up this same role in my spare time for my husband's

company. At the out start, I found myself a student with a clear plan, at the end I find

myself a wife and employee with more responsibilities than free-time.

4.0 INNOVATION AND TECHNOLOGY AS INSPIRATION

"Everyone dreams about being like Bill Gates or Steve Jobs, of starting off with just an idea and making that idea a reality worth billions of dollars..."(Tim)

4.1 An Introduction to the 'team'

As mentioned in the previous section, the main findings of this study come from individual interviews with fourteen high-tech professionals, informal get-to-gethers with professionals, and a limited amount of time spent in a high-tech company. However, in interviewing these fourteen professionals, I gained insights into the corporate structures and cultures of a number of small, medium, and large sized companies through their accounts of their work environments. And I was also able to gain insights into what made the high-tech professionals I interviewed 'tick' – what their interests were, what their work was like, what their co-workers were like, what made them happy, and what frustrated them about their jobs. (For more insights as to what those interviewed were like – please refer to the short summaries of interviews found in Appendix 2).

Those interviewed ranged in age from their mid twenties to over forty years of age. Eight of those interviewed namely – Assam, Balint, Jay, Matteo, Monique, Richard, Tim, and Tom – were under the age of thirty at the time that I had interviewed them. Frank, Lex, Michael, Natasha, and Sam were all in their thirties, and Josephine was in her forties. As far as the links between those interviewed, Tim, Balint and Assam were at the heart of *my* high-tech professional network – introducing me to Frank, Jay, Lex, Matteo, Michael, Richard, Sam, and Tom. Monique, Natasha, and Josephine

however, were found in talking to my personal networks of friends and through my

extra-curricular activities.

One of the concepts that would reoccur in my conversations with these professionals

were the values of technology and innovation attached to their jobs, and to a certain

extent in their personal lives (cool gadgets). As mentioned before, these professionals

find themselves at the forefront of the network society, and how they approach and

cope with their work ultimately affects their lives.

Assam was at his fourth company when I interviewed him – he had been bouncing

around from company to company, using this technique to expand both his skill base

and his salary. He seemed relatively happy with all of his moves, leaving companies

when the work began to bore him, or the working conditions were too intense

(excessive travel). He seemed to see the industry for what it was – networks that he

could use to his benefit. He had worked for companies that were large, and that were

mid-sized, making and working at preserving links along the way.

This differed from Balint's perceptions – at the time of my interview with him, Balint

had just begun working for a small start-up company, after having been downsized

from his previous job at a mid-sized company. The down-sizing had been tough on

Balint – he had really enjoyed the work he was doing. Not only this, but he felt close

with the other members of his team, often hanging out with them after work, and of

course there was the travel – new and exciting places to work in and visit every

couple of weeks. However, at this new company, Balint felt like he was more in

control because it was so small, he had direct access to his boss and really participated

in the development process from scratch, rather than just being assigned small tasks.

Frank worked for a large company as a hardware developer. His job was secure as he

had established seniority with the firm, but he was bored with the work that he did.

He taught dance in his free-time, and it was running this growing business that

brought him joy – he worked to live. The last time we met, he had begun a masters

degree in engineering, which his company was paying for, and allowing him a

decreased workload in order to complete.

Jay had ridden the high-tech rollercoaster since graduating from university just as the

dot-com bubble burst. He had worked for a number of large companies throughout

university, but when the contract he signed with a high-tech firm before graduation

went belly-up, he decided to return to school for a masters degree. After completing

his degree, he worked briefly for another large company before finding a permanent

placement with a government agency. He liked the new-found stability that this job

brought him, and enjoyed that his job was all about thinking 'outside of the box'.

Josephine had practically grown up in the company that she worked for. While still in

school, she had started at the company as a summer job (her mom worked there), and

had been given a position there after graduating from university. Many years later,

she found herself in charge of a group of programmers who developed inter-net

related hardware and software. The company was large and bureaucratic, with clear

and set paths for its employees to move along throughout their careers.

Lex, like Assam had seen a lot of movement between companies throughout his career. Like Jay, he had decided to complete a masters degree right after his first university degree when job prospects were dismal. Since graduating, he had been working towards what he believed to be financial independence – earning enough money to start his own company based on the ideas he had developed during his masters degree.

Matteo had had difficulties finding a job in high-tech since graduating from university. Before graduation, he had a signed an employment contract that fell through – a reality he only learned after returning home from travelling through Europe for two months. The types of jobs he was now working in were not challenging, and he felt that his programming skills had stagnated – but how does one find a better job when your skills aren't up to par? Matteo seemed confused as to what his next move would be – should he go back to school or look for work in a more 'stable', but boring job? He wanted some type of work that would challenge him to be creative – that was what had attracted him to working in high-tech – but that he had not yet found in his jobs.

Michael had recently immigrated to Canada on a work visa provided him by his former employer. While he had really enjoyed working for this mid-sized company, even meeting his live-in girlfriend there, he did not enjoy how much it invaded his private life. His job involved long stints of travel for undetermined amounts of time in order to install the company's systems and fix any integration problems with their

existing systems. His decision to leave the company in order to complete a bachelor degree in engineering was partially because of this – he felt like he was missing out on large gaps of his life and his girlfriend's life because of work.

Monique had used her jobs in high-tech to travel and live in different places across North America and in Europe. As a child her family had also moved around a lot due to her father's job – so for her to travel did not seem unusual. She enjoyed the new sights and sounds, as well as making new friends – using these growing networks to find her next job. However, pure 'coding' was not of the most interest to her, and her last job-hop was into a position that was technical, but more sales related.

At the time I interviewed her, Natasha had been working for a large, down-sizing company for a number of years since graduating from university. She had survived numerous personnel cuts, where at times she was virtually the only person left on her floor of a particular building. Her responsibilities would grow with each successive cut to her co-workers – leaving her stressed with work on a daily basis, and leaving her yearning for a time when she would not have to work overtime almost daily. She took solace in her extra-curricular activities in order to relieve her stress, spending time with her father, and boyfriend as much as possible, and trying to increase endorphins through running, skating and playing volleyball.

Richard had recently been promoted to a manager position when I interviewed him. He was enjoying the new responsibilities and pay increase involved, having survived a merger and downsizing within the company since beginning work there. The one

aspect that he did not enjoy was how much work was cutting into his personal life –
with a group working on flex-hours, he was on-call by cell-phone 24/7. In order to
compensate for the intrusion into his life, he found that he and his wife had begun to
schedule their private lives – a schedule he would leave at the office so that his
colleagues would know when and when not to contact him.

Sam's career had taken the route of an expert – jumping from company to company,
as a means of increasing his salary range and prestige within his particular field of
high-tech. He had even authored a few books on his specialty – making his moves
easier as his name was well known across borders. He seemed always on the look-out
for that next possible job, expanding his network of contacts with each jump of
company.

Tim had started his own company at the time that I interviewed him. His start-up was
small with his staff reaching a maximum of three. He really enjoyed the freedoms
that running his own business afforded him – he would develop customer ideas from
just an idea into a functioning product, controlling the product's development every
step along the way. This sense of control and accomplishment was different from
what he had felt at his last job from which he had been downsized. Being down-sized
had left Tim devastated as he had really seen a future for himself at the large company
– he really enjoyed the company of his co-workers, and the infrastructures the
company had in place for its employees. Now with his own business he enjoyed
being a boss, and knowing what awaited him at least until the end of his client
contracts.

Tom, not unlike Matteo, had not had the most success with finding work after two

down-sizings. Working in high-tech had left him at odds with what to do for a living.

He wasn't sure if this was the course his career should take – having been trained as

an engineer, he did not understand why he had had so much trouble finding work – he

seemed to have the qualifications that employers were looking for – but was being

passed over interview after interview. He did not like the job insecurity he had

experienced in his previous two jobs and was unsure as to what the future held for

him. Even starting his own company hadn't led him to success...

The industry challenges faced by high-tech professionals are at root a product of the

organizational structures and cultures of the companies they work for. With this, the

organizational cultures of high-tech companies have interesting problems and

opportunities of their own to mitigate on a daily basis, and their cultural constructions

can help them to deal with the issues impeding their success. Many of those

interviewed, found that the concepts of innovation, growth, and creativity best

described the industry in which they work and the organizational cultures of the

companies they worked for. As will be discussed in the next sections, much of the

organizational structures in high-tech are based on these values.

4.2   The Role of Innovation in High-tech

Innovation according to Webster's Dictionary can be defined as: (1) the introduction

of something new; (2) a new idea, method, or device. Furthermore, innovation in the

sense of technology can be seen as an improvement to something already existing

(Encyclopaedia Britannica). In the sense of the high-tech organizations, all the above definitions would seem to hold true, where the high-tech firm is constantly in an uphill battle to improve its existing products and at the same time in a race against its competitiors to develop new, revolutionary products that will be the next industry or consumer 'must have' – giving them a momentary edge in the marketplace. Of course, this rate of development does not hold true on the same scale for the industry as a whole as companies' varying budgets and staff account for the speed at which they can produce, but in general a high-tech firm must adhere to a 'sink-or-swim' scenario – either they are able to innovate or they will drown as members of the global network economy.

Understanding this need to innovate is crucial to understanding the motivation of the high-tech professional (as will be discussed later), and the culture of the organizations they work for. One description of the high-tech industry explains the relationship of innovation in terms of 'creative destruction' where "Economies are driven by successive waves of innovation, during which entrepreneurs take advantage of opportunities and then 'swarms of new firms cluster around talent and technology."(Henton, 2000: 46) This term, "creative destruction", was first used by the economist Schumpeter in the 1930s to describe the process of industrialization. This is not unlike the emergence and quick expansion of the producer/specialised services herallded by Sassen as *quid pro quo* with the reorganization of work into networked organizations rather than the bureaucracies of the past. The more innovative with technology that the professionals and the companies are, the greater their chance of survival in the job market (in the case of the professional) and in industry (in the case of the company).

4.2.1 Corporate Histories

In talking with the people I interviewed, it would seem that company the histories of

the high-tech industry are attached to the concept that an idea can change the world.

Many of those interviewed made reference to either Bill Gates or Steve Jobs –

industry leaders who were able to take their ideas and innovate them into products

that change the way we all do our work on a daily basis. Related to these and other

high-tech company founders that struck it rich, the legends of high-tech organizations

also have strong themes of innovation at their core. Often these are attached to the

ideas of a company's founder or to the company's founding technology that gave the

company its first major success. As can be seen in the following examples given by

Balint and Tim, these founding stories are an important part of the organizational

cultures of high-tech companies.

The company Balint first worked for after graduation had a typical 'make it rich' story

attached to its founding. The story of the company's origins was related to Balint by

co-workers over lunch on one of the first days after he had begun work there. The

founder and CEO of the company had worked at a few different companies before

deciding to go out on his own with an idea for a video software based product that he

thought was lacking in the marketplace. The founder was seen by the employees and

others in the industry as "...a half-god in computers...", starting out with only four

people and then expanding the company to over fifty people after only seven years.

As can be imagined, the company's successes, having sold many of their systems to

high profile clients in the US, has permeated the company culture. It became

apparent to Balint, that the founder of the company who was viewed as a visionary,

really enjoyed his work and had a great appreciation for the company he had built from scratch on an idea.

Tim's first company that he worked at after graduating from university also had a similar tradition surrounding the founding of the company. After years of working for other hardware and software firms, two university friends came up with the idea and built a product in their spare time, which became a best seller in the industry. This piece of hardware became the main platform for all of the company's products, and helped them grow over the course of 25 years from a garage operation to a few hundred employees. It had also turned the two friends into multi-millionaires, but each still managed a branch of the company.

As can be imagined, the founding stories on which these company cultures are based, do not solely encompass the tale of a company's inception, but can also be about how a company's great successes or overcoming their failures were achieved over the course of doing business. These company tales give employees role models to emulate in order to ensure greater success for the company. In most industries, the recounting and use of company histories is a means by which to indoctrinate the employees into the company's beliefs and values. In high-tech however, with so many companies such as Microsoft and Apple having founders that have 'made it big', and the industry's dominant values of innovation and creativity, these stories can also fuel employees' beliefs that they too can 'make it big' with the right idea. This in turn may become a danger to any high-tech company's hopes of low turnover in its employees. With so many examples of successful start-ups, the attitude shared by

many of those interviewed was that one day they too could 'make it big' with the right

idea, a little innovation, and a lot of creativity.

In the wake of the burst of the dot-com bubble, I had expected more of the

professionals that I interviewed to voice a more weary perspective on beginning their

own start-ups some day. To the contrary, Tim, Assam, Jay, Lex, Sam and most

recently Balint, have all attempted to develop their own businesses, based on their

ideas for new products or services to bring to the market. Of these six professionals,

only Tim and Balint have been able to generate profits from these business

endeavours – the other four professionals were unable to make a real go of their

businesses. When I asked Lex about his attempt at building his own business he was

proud that he had made the attempt – he had taken an idea from scratch and developed

it into a full-scale product, all on his own. Sam's opinion on running one's own

business was much more simplistic – "…it's the only way you can really get rich."

All of the men who had started their own businesses expressed a pride of sorts in

taking a risk and trying to live the "high-tech dream".

4.2.2   Company Bonding?

Another aspect of organizational culture which presented itself while studying high-

tech professionals, were the rituals (or lack there of) that their companies used as a

means of generating a sense of cultural belonging to the organization. Those

interviewed spent about two years on average at a company before either voluntarily

moving on to a new company, or having to change jobs because of lay-offs – both of

which would seem to be reactions to the reorganization of work in the network

society.

As compared to the old model of company cultures, where a company's culture would

be passed on by elders (or rather, senior employees that had been at the company for a

number of years) to the neophyte employees as they entered the firm – the majority of

high-tech firms as truly nodal 'networked' organizations, do not usually have a long-

term staff base capable of passing on this vital cultural information. As Sennett

proposes, this may be a product of shame about dependence that has become

prevalent in the network society, eroding mutual trust and commitment, and as a

consequence – personal character (Sennett:1998, 141). Trust is an important factor

for any organization, and has seemingly been lost in the new network society and

network organization, where the bond of trust develops in the cracks and crevices of

bureaucracies as people learn on whom they can depend (ibid). The new methods of

flexible production, downsizing and outsourcing leave employees with little chance to

develop these types of trust structures among them. Therefore, there would seem to be

less emphasis placed on activities that are 'ritualistic' within the cultures of high-tech

professionals, but a few examples were to be found in the tales recounted by those

interviewed.

The first in particular, is in the form of employee hiring processes. Even though

almost all of those interviewed had gone through rigorous training in either computer

engineering or computer science in university – they were usually put through a

plethora of tests by each prospective employer before being hired. As Michael

recounted about his interview processes – these could include phone interviews,

programming problems to be done on the spot, logic and IQ type tests to take, and

many, many interviews, often with three or four different people from different

departments in the same company.

Richard recounted a company organized weekend retreat to new head offices in

Boston, after his company had gone through a merger. Employees were treated to fine

dining, sight-seeing, pep-rallies, technology conferences and even a baseball game –

giving them a chance to spend time with their new company-mates, and fostering a

sense that everyone's hard-work was needed for the success of the company.

Another example of the methods used by high-tech companies to retain their

workforce, was one company talked about by Tim. The company was large, with

over a thousand employees, and had established its own campus of buildings in the

Montreal area. While building the campus, the company had been able to include an

outdoor swimming pool, a basketball court, and a hockey rink area for in the winter,

not to mention a full-scale gym and even a daycare. The company also organized

sporting leagues for its employees to participate in, with championships held at the

end of every season. According to Tim, turnover rates were low as a result of all

these activities, making employees feel like they belonged and were an asset to the

company.

High-tech companies as members of the network economy seem to be constantly

changing and upgrading their products to remain competitive, and are privy to

changing workforces, and changing economic conditions on a daily basis. When

discussing the industry and organizational culture with many of those interviewed,

this propensity for change seemed to them a given linked to the concepts of

innovation and evolving technologies.

These attempts at employee retention, do not seem especially effective given what

Sennett refers to as the cornerstone of modern management practices in loose

networks (Sennett: 1998, 48). These loose networks are more open to decisive

reinvention of company structure than the pyramidal hierarchies of the Fordist Era

(ibid). This means that management would be able to take away a part (in theory),

without destroying other parts (ibid). As the system is fragmented, there are more

opportunities for management to intervene. The incoherence of the organizational

structure invites revision on a constant basis (ibid). In a re-engineering of the

business structure, the most salient fact experienced time and time again by the high-

tech professional is a down-sizing of jobs (ibid, 49).

4.3   Workforce trained to continually push forward

Industries tend to attract like-minded individuals with similar beliefs and interests into

their ranks. This can be seen as being true of the high-tech industries as well,

however, the socialization processes to the industry, can be seen as starting off much

earlier when a student chooses what to study in High-school and especially in

university.

Barrett comments that the work of software developers or computer programmers produces software which is a uniquely designed, highly structured set of assertions which must be negotiated, codified, analysed for consistency and validated for effectiveness in a constantly changing environment (2004, 778). With this, she suggests that the high-tech development process is creative and can be likened to art – code is written without any vigorous planning and then 'hacked' to remove bugs and increase functionality (ibid, 779).

4.3.1   *Education*

Most of those interviewed had completed a bachelors degree in either computer engineering or in computer science before working full-time in the high-tech world. Throughout their degrees they were taught methods that would enable them to bring their ideas to fruition – to create within defined structures, and to sometimes push the boundaries of these structures. These courses included mathematics, physics, electronics and circuitry, hardware and software architecture classes, as well as how to work with databases and countless different computer programs in order to get their homework done. However, it is not clear whether this training constitutes an affiliation with creative processes or rather technical training. As English-Lueck shows in her article *Doing Good*, a mastering of information technology holds promise for the professional that chooses that career path in that it presents the reality of shifts in the locus of power to new sites and new categories of elites (2001,1). The technologies and work methods of high-tech require expertise to master, and in cultures where expertise is valued, this can act as a vehicle for enacting morality – better living through technology (ibid).

This education also included the learning of new languages and jargon specific to the computer. Language is "...a shared system of vocal sounds, written signs, or gestures used by members of a culture to convey categorized meaning to each other. Language employs categories and rules through which people structure their perceptions and understanding of the world."(Trice & Beyer, 1993: 78) These computer languages have their own syntaxes and dialects for the professional to learn. They enable a programmer to 'talk' to the computer, and communicate with colleagues on an additional level. As will be discussed in a later chapter – among the professionals themselves, there seems to be those who are more adept at communicating and directing the computer, than they are with actual people and vice versa.

For graduating engineers in Canada, this socialization process also involves a ceremony called "The Ritual Calling of an Engineer" presented by The Corporation of the Seven Wardens Inc. This ceremony involves initiating new engineers to the profession by having them take an oath to the diligence of their work in the future – symbolized by bestowing the new engineers with an iron ring to wear upon their 'working' hand. In the computer age, this has now become the hand with which they write, as most engineering work is now done on the computer or with computer assisted drawing of some form of another.

4.3.2 *Entrepreneurship*

Another of the core values attached to high-tech is the entrenched entrepreneurial spirit of the industry touched upon before when discussing corporate histories. As mentioned before, many of those that I had the privilege of interviewing, had attempted starting their own businesses, in keeping with the dream sparked by visionaries such as Bill Gates and Steve Jobs. As Gregory-Huddleston postulates in her article *Culture Conflict with Growth: Cases from Silicon Valley*, "Entrepreneurial teams found start-up companies because they are attracted to the excitement, opportunity, and intimacy of a small aggressive firm..."(1994: 122), a place where they can get things done. In talking with Tim, who has achieved this dream of running his own company, he stated "...it's great! I enjoy being able to control all the different parts of a project. It's a lot of long hours at the office with my team to get the projects out in time, but we know that the rewards will be going directly to us – not some head honcho at a big company who needs another yacht."

However, this entrepreneurial spirit comes into question for the high-tech organization and its culture, as small companies grow into large companies. "It's no longer a lean mean start-up. It has become a large mature company with customers to support, products to maintain, shareholders to pacify. The larger company doesn't support or reward entrepreneurism as well as the start-up did, and thus it doesn't attract the same breed of risk-takers."(Gregory-Huddleston, 1994: 122)

4.3.3 *Flex time and the creative process*

"...you never know when you'll figure out that latest piece of code that was holding

you up...people can go in when inspiration hits them, we all have our security codes

to get into the building...I've been in until 2am some days, and then back at 2 pm or

3pm the next day. Some people are just more creative at weird hours of the day."

Assam recounts when asked about flex-time.

According to Nevens in his article *Innovation in Business Models*, the business

models within high-tech:

"...have several notable attributes. These companies are flexible. They move quickly.
Many are highly focussed, not only on a particular product set and customer segment,
but also on one part of the value chain...[These] models are open and fluid. Open to
new ideas and new people as well as to new technical standards,... constantly
inventing new ways of doing business."(2000: 81-82)

In order to cope with the realities of the creative process involved with programming

and hardware development, the innovation of business processes in high-tech

organizations has led to the use of flex-time or flex-hours.

Flex-time according to Sennett, was a product of women entering the workforce,

where instead of adhering to regimented hours, flex-time allows for more

individualized schedules (1998: 57). This type of scheduling also has its downsides in

trying to manage the logistical challenges of employee scheduling: impromptu

meetings cannot develop as some members of a team may be out of the office;

questions on a particular line of code have to wait for a later date when the employee

is in... Tim commented that at one of the companies he had worked for, flex-time

had to be re-worked. All members of his team were asked to be in the office between

10:00 and 14:00 in order to cope with missing team members and their days off.

Sennett goes on to postulate that with flextime "...workers thus exchange one form of submission to power – face-to-face – for another that is electronic... Work is physically decentralized, power over the worker is more direct."(1998:59), and extends the reach of control that the company possesses further into the employees' lives.(ibid)

4.4   Cultural Continuity?

One of the dangers in attaching the cultural values of an organization to the concept of innovation, growth and creativity, is that it becomes difficult to culturally mitigate the constant changes that are involved. When the decentralization of the work structures and hierarchies, as well as Flex-time are thrown into the mix, not to mention the fast pace of innovation; how can the cultures of high-tech find any sort of continuity?

Many of those interviewed did not recall having gone through a formalised orientation session, and some like Balint spent his first days on the job reading through Human Resources material concerning health plans, as no one was available to show him around. Assam also had a similar experience, where his team members were in the US on a client call, and his computer had not yet been installed by the IT department. In these cases the problem was not in how to properly socialize the new employee to the new organizational culture, but that there did not seem to be a socialization process at all.

In respect to the innovative and creative aspect to high-tech development, Kunda in his study of engineering culture, found that the engineers he observed acted in the company's best interest, not particularly because of economic rewards, but because they are motivated by the satisfaction they draw from their work and identification with their company's goals (1992, 173-174) – however, this type of self-motivation only becomes possible when as Sennett (1998, 2006) suggests, employees feel both useful, and a strong sense of trust and commitment to the organization they are employed by. With this, the working conditions shared by high-tech professionals can be seen as similar to those of service or specialized producers discussed by Sassen. When looking at Bryson, Daniels, and Warf's study of service occupations, they state that today's economic system is one in which a significant amount of knowledge is vested knowledge products (2004, 46). With this, of the fastest growing occupations in the US labour force, computer and software engineers are at the top of the list.(ibid, 107)

5.0   ORGANIZATIONAL ENVIRONMENTS WITHIN HIGH-TECH

Office environments are each unique in their own right – depending on the type of

work, the culture of the company, and the personalities of their employees – no two

environments are exactly alike. It is no surprise, then that the office environments

discussed by those that I interviewed differed on many levels, but also (as will be

outlined following) had their similarities.

It would seem that the standard layout for the high-tech companies that those I

interviewed worked at, were some form or another of an open-concept office, whether

in cubicles or in at desk stations. This type of environment is at its heart rooted in the

ease at which management can oversee and control employees' work. The open-

concept is convenient for the network organization as it is impersonal and allows

people to flow in and out of the organization as needed. However, those interviewed

time and time again would mention that they thought the use of an open-concept was

in order to ease the 'innovative', group process – allowing for a free exchange of

ideas. Their actions however, would suggest otherwise, as they try to carve out

personal space in an environment shaped throughout the decades to minimize this

personalization of the work environment – giving them a sense of belonging, where

there is none formally offered by the spatial environment itself.

As mentioned before, Carrier and Miller point out that over the past two decades we

have seen the rise of the market-driven, flexible firm accompanied by a demand for

market-driven, flexible workers (1998, 1-2), and the organizational structures of high-

tech companies discussed by those interviewed would seem to fit this trend. This rise

in flexible work has come to mean flexible workers that can be hired and fired easily, and the shift of production off-shore in search of lower wages (ibid). More interestingly, Carrier and Miller have noted a trend in the west towards *virtualism* of the economy. They stipulate that there is a removal of economic activities from the social and other relationships in which they had occurred, and a subsequent carrying out of these activities in abstraction from social relations (Carrier & Miller: 1998, 2). In the west, this abstraction has been accelerating over the past century, and especially since the Second World War (ibid, 3).

While the world's economies have been through a series of phases in production, shifting from cottage industry (production controlled and carried out by the household), 'putting-out' (households producing under the direction of and using materials supplied by merchants), early factory production (production shifts out of the household and becomes more under the direction of the capitalist), and lastly, modern factory production (capitalist controls production directly) – the emergence of industrial capitalism was associated with a general concern with observation, supervision and control (Carrier & Miller: 1998, 226-33). This concern with observation, supervision and control can also be seen as the real purpose of the set-ups of the working environments of high-tech, despite the fact that many professionals are lead to believe otherwise – almost everyone interviewed spoke of the free exchange of ideas in an open concept office, but also related methods for coping with noise, and distraction (to be discussed further in a section to follow).

In light of this 'virtualism' of economies, an ideal of life-time employment with the chance to climb the corporate ladder year-after-year, would not seem to be a reality for the professionals that I interviewed. With the exception of one person that I interviewed (Josephine) – this is not the model for employment understood by the people I interviewed in high-tech, and even Josephine remarked on the fact that her career path was anomalous. While Josephine (her case to be discussed in further detail later in this study) was able to work her way up the corporate ladder to a managerial position, all of the other thirteen people that I interviewed, found themselves either changing jobs due to layoffs, or for other reasons, attached to the 'job-hopping' trend in the industry, where professionals change jobs every few years (to be discussed in the next chapter of this study).

Tying into Carrier and Miller's concepts, as more companies made shifts towards decentralized corporate and office structures – where these more organic structures had "...a wide span of control, little formalization, and decentralized decision-making."(McShane, 2004: 435), these 'looser' structures became an integral part of most technology companies' structures, portraying images of innovation and forward-thinking not only to their employees and prospective hires; but also their shareholders.

However, as technology companies grew, their corporate and office network structures also had to evolve to cope with the changing realities of a larger workforce, albeit with the same regard for employees as nodes in an expanding network. Growing-pains such as these, can prove difficult to manage, as the cultures of many of these high-tech firms incorporate a great value for knowledge and the belief that

information and knowledge may be located anywhere in the organization rather than just among senior executives (McShane, 2004: 435). This methodology becomes more difficult to manage as the employee and manager ranks grow and can sometimes lead to a clash between the existing and evolving organizational cultures, with employees left confused in the mix.

As Sennett points out in *The Corrosion of Culture*, organizations in high-tech seem well-suited and centered on the concept of 'flexible specialization', where companies try to get more varied products ever more quickly to market.(1998, 51-52) This production method suits high-tech in that machines thanks to the computer are easy to change and reconfigure; the speed of communication is making market data instantly available; and quick decision-making suits the small work groups prevalent in high-tech, whereas in large bureaucratic pyramid-like organizations, decision-making is slow (ibid). With this Sennett postulates that in the case of high-tech organizations, shifting demands of the outside world determine the 'inside' structures of institutions, and an ever-increasing need for responsiveness to these outside conditions, leads to the acceptance of decisive and disruptive changes on a frequent basis.(ibid)

The problems with open-concept environments in the context of high-tech arose when these environmental and conceptual structures were forced to change, in order to cope with exponential growth and expansions during the high-tech boom. Informal and formal hierarchies quickly developed in what were supposed to be decentralized firms, in order to handle the day-to-day realities of managing large groups of employees. This left in its wake a whole gambit of contradictions for any high-tech

company's management to resolve as they made the shift from small, entrepreneurial

start-up to lean-mean-market machines.

Castells' comments on the crisis of the large corporation in today's economy seem to

still reflect the dilemmas faced by 'networked' high-tech companies. His argument,

echoing Sennett's is that small and medium businesses appear to be forms of

organization that are well-suited to the flexible production systems of the

informational economy (Castells: 1996, 156). With this, these smaller 'nodal' firms

would seem to come under the control of large corporations that remain at the center

of the global structure of economic power (ibid) Similar to the contradictions of the

high-tech firm as it expands, Castells postulates that there exists instead a crisis of the

traditional corporate model of organization based on vertical integration, and

hierarchical, functional management (ibid)

5.1   The Open-Concept Office

Almost all of those I interviewed reported working within one or another type of the

open-concept office – whether it's in the form of cubicles or assigned desks – the

open-concept office it would seem, has become a norm in the high-tech world. As

discussed before, the corporate structuring of most high-tech companies is

decentralized in nature, and the loose environmental structure of the open-concept

office would appear a good fit with the types of creative processes involved in high-

tech. While the reasoning for such an open office layout may seem noble to most of

those that I interviewed – in that the open-concept model should allow for the free and

spontaneous exchange of ideas and open communication – as is the case with most

things – it also has its downsides.

When looking at analysis from Freeman on the culture of female data-entry workers

in the Caribbean, many similarities can be seen with the work of those I interviewed.

Like the high-tech professionals in Montreal, the women of Freeman's study also

found themselves in open offices, sitting in clustered computer stations, clicking on

keys and listening to their walkmans – however, while they clicked away, their

productivity was constantly being monitored (2000, 1). Freeman sees the nature of

computer work as atomized and individual in which key players are physically

divided from each other at cellular stations through a double layer of surveillance –

the deep level of computer monitoring at the surface, and a layer of human

supervision (ibid, 199).

Most of the people that I interviewed saw their jobs in terms of creative work, rather

than manual work, despite the fact that they were constantly pounding out code on

their keyboards.   In particular, Tim and Lex mentioned creativity and talent as being

essential to approaching programming. Tim mentioned always having an open-door

policy in his own company, and that his boss at the company he had worked with had

an 'open-cubicle' policy. Lex talked about being able to walk up to one of his co-

worker's cubicles without hesitation if he had questions or needed to sound off ideas.

High-tech industry in particular seems to have done away with the confines of offices

(and the corporate ladder for that matter) for most programmers and engineers; opting

instead for environments that are commonly large, open spaces housing many desks

or cubicles. These environments are seen as more organic, and geared towards the

open exchange of ideas among employees, other colleagues and their managers, and

seen as facilitating the 'innovation' on which the industry is based. However, hiding

in the background, the true motivations for using open-concept offices can be seen –

echoing Carrier and Miller, as well as Freeman's comments, they are means for

management to observe, supervise and control – despite the professionals' altruistic

views.

Through the course of their careers at the time of interview, those interviewed all

together had worked in roughly fifty different high-tech companies ranging in size

from thousands of employees to a handful, in a multitude of different roles. With this

in mind, the measure used for a large firm was over one-hundred employees; the

measure for a mid-sized firm was over forty employees; and the measure for a small

firm was under forty employees. The descriptions of Frank (large company), Michael

(mid-sized company), and Tim (small company), seemed to best represent the

accounts of most of those interviewed.

5.1.1   Large Company

Frank had worked for two large firms since graduating university with a computer

engineering degree. His description was simple – "...they're cubicle farms...". Both

work environments were structured around large, open spaces subdivided into smaller

meeting cubicles or conference rooms meant for group meetings, and even smaller

cubicles for the employees themselves. At the first company, managers found

themselves in closed offices, whereas at the second of the two companies, the

managers were given cubicles around the perimeter of the space with access to

windows. The cubicles themselves were usually quite basic, containing a work chair,

desk surface of some sort, and of course at least one computer. Another characteristic

that was common to these work environments was the hum of the various machines in

use, and relatively low lighting.

These same conditions were echoed by comments from both Josephine and Natasha

who also worked for large firms. Josephine was in a management position, and had

her own office; but the team of programmers that she managed worked in cubicles not

too far from her office. She recounted that the location of her office made it easy to

interact with her team, but that the added advantage of a door to close behind her

helped when she had to make telephone calls to head-office or when meeting with

clients. In Natasha's case, the two work environments that she had worked in were

virtually identical as they were both within the same company, but in different cities.

Both consisted of *cubicle farms*, with her immediate managers in larger cubicles.

Interestingly, Frank, Josephine, and Natasha all mentioned that those in the upper

echelons of their companies worked in closed offices – in Frank's case, these offices

were housed in a separate building on the same campus as his building; in Natasha

and Josephine's cases, the upper echelons worked at the head offices of their

companies.

5.1.2   Mid-sized Company

In Michael's case, the mid-sized company he had worked for had recently moved into

an office space that could accommodate their entire staff at the time of his

employment. The space itself was a floor in an old factory, with windows along one

wall of the space and closed offices along the opposite wall. The different areas of

the space were divided up based on the three groups that the company itself was

structured into – namely engineering, graphics and special projects. Those not of the

management echelons shared the large office loft filled with custom-built ergonomic

desks. The desk surface became each employee's work space, housing their

computers, a phone and underneath, a small filing cabinet to store their personal

effects and other work related materials.

Monique and Sam's descriptions of their mid-sized company work environments were

also comparable. Monique's time at a European research institute was spent sharing a

floor of the institute with her other project members. Some in the group had more of

a cubicle composition to their workspace, while others in the same open, space had

large desk areas to work on. The environment was relaxed with music often playing

in the background and occasional *hacky-sack* breaks to the outside. Sam's mid-sized

company, like Michael's also subscribed to offices for those in managerial positions,

where Sam himself had an office quite a bit away from the group he managed. The

members of Sam's group again shared a large, open, space littered with their

individual cubicles.

5.1.3 Small Company

Tim's software development company began in his home, but as his business grew and two employees were hired, the need to find office space became apparent. After a few visits to commercial spaces across the city, he finally decided to house his operations in a large loft complex, occupying one of the smaller offices. The space had windows along the two outside walls, and was bright and airy. The main room had enough space for a maximum of five desk areas, as well as a conference table area. Off the main room was a smaller room that Tim decided to use as an office for himself rather than as a conference room, citing often having to make private phone calls to clients. When asked why he opted for an open loft space rather than closed offices he had two reasons: (1) cost; and (2) availability of rental space. As Tim so bluntly stated, "Walls cost money...", and those spaces within his price range were all loft spaces.

5.1.4 Small, Medium, Large Compared

When looking at the above examples of open-concept offices, more similarities rather than differences begin to appear. One of these similarities is the use of closed offices for some, while the vast majority find themselves in open, shared spaces. This is not unlike the data-entry workers discussed by Freeman, the old style secretarial pools, and today's telemarketing call centers. My own work environment at a small firm is also open-concept, and as a manager, I can appreciate the supervisory and control aspects of being able to walk up to an employee's desk to see what they are working on (and yes, it is easier to 'catch' people chatting on personal phone calls, chatting on-line, and sending personal e-mails).

From the accounts of the professionals that I interviewed, it would seem that the use

of closed offices was almost exclusive to those in managerial type positions. At

which stage of the managerial ladder a manager was assigned a closed office was not

standardized among the different companies talked about – but among the almost fifty

companies that make up the work experience of those interviewed, this trend for

management appeared in all of the work environments described. No completely

open-concept office presented itself throughout the course of the interviews

conducted.

This finding in itself became of interest as most high-tech companies make the claim

of trying to instill in their employees a sense of egalitarianism – a "we're all in this

together" mentality, despite the realities expressed by Sennett, Sassen , and Castells

concerning the organizational structures of the 'networked' firm of the network

economy. In this sense, the office environment itself can be seen as yet another

contradiction facing the high-tech professional at work – "we're all in this together"

but only some of us are together where we actually work.

Another similarity was in the use of either cubicles or desk spaces to define an

employee's work space within the open-concept office   The larger companies seemed

to have a greater propensity for using cubicles, while the smaller firms tended more to

use desk areas. In most cases, this would seem to be more connected to costs rather

than any other factor – as Tim stated, "Walls cost money."

As mentioned before, the stated perceptions of most of those interviewed, for use of

the open-concept office in high-tech was the innovative and creative nature of the

industry. While some interviewed made reference to the fact that they may feel

uncomfortable approaching an actual office of a manager or higher-up; they felt no

qualms at any time about going up to another group member's desk or cubicle to

discuss ideas or problems. Some interviewed, also mentioned that when group

dynamics were strong, co-workers would not hesitate to eavesdrop and chime in with

suggestions or solutions if they had them. However, interjectory behaviors leads to

the question of whether or not this practice stimulates creativity or hinders it as people

are constantly being interrupted (coping mechanisms for dealing with the openness of

the open-concept will be discussed in the next sections of this chapter).

A last, more ambient similarity, was that most of the work spaces that were assigned

to programmers or engineers (those who spend most of their time writing computer

code), were more dimly lit than the areas reserved for their managerial counterparts.

This is mainly due to the fact that computer screens are easier to focus on when the

surrounding lighting is less intrusive.

5.2   Issues of privacy, individuality, personal space and ownership in the workplace

There arise problems with any model that is broadly applied throughout a social

system – whether or not the environment in question occurs naturally or is

orchestrated. Depicted in the following section are more issues dealt with by the

professionals I interviewed, in high-tech work environments – issues such as privacy,

individuality and feelings of ownership in the workplace, and how these relate back to

employee loyalty and attachment to their companies.

5.2.1   Privacy and Personal Space

As discussed before, the perceived altruistic reasoning for open-concept offices, has

its roots in the open and free exchange of information and ideas between team

members and management. However, as was demonstrated by Carrier and Miller,

Freeman and Sennett, employees in this open-concept structure, find themselves in

more of an atmosphere of surveillance and discipline, than free-exchange.

This looser environment however, could be seen as naturally hindering personal

matters from entering into the work environment. If every telephone call can be

overheard, every e-mail in danger of being read over your shoulder, every

conversation by the water cooler overheard by other co-workers or managers, every

picture on your desk open to be scrutinized by the others around you – there remains

little room for the personal realm to enter the work realm.

Assam in particular had expressed frustration with the lack of boundaries for personal

space within one of the companies he worked for, as opposed to the cubicles used by

his other employers. This particular company grew from a small start-up to a medium

sized company within just a few years. When Assam entered the company he was

assigned a desk in a large loft space filled with a myriad of other desks. While his

desk and chair were top-of-the-line, and ergonomic in order to assure his comfort

while working; the fact that the space assigned to him was so open began to annoy

him. When he would have to make a personal phone call, he would have to go

outside to assure that he was not overheard or disruptive to his co-workers or his

managers. Also, with no door to close, or cubicle walls on which he could post a 'do

not disturb' sign, Assam found himself constantly having to re-focus on his work after

the interruptions of co-workers, his group leader, or other managers with questions for

him. Understandably, he felt stressed by the fact that anyone could be watching him

at anytime. The cubicle walls of his next job were a welcome boundary; he now had

what felt like his own space. As shown by Assam's experience, personal space for

many is an important part of feeling comfortable in the workplace.

The need for personal space and the sense of individuality and privacy that is attached

to it, is important in any work environment in order to keep employees happy. One

reason that may explain why this type of individuality and personal space is not

planned for, is the fact that many high-tech firms deal solely with intellectual

property. In this sense, the open-concept office aids as a control mechanism to

prevent theft or leaks of the company's intellectual property by employees because

there is always someone around. Also, with the personal aspects of life pushed out of

the picture by the possibility of the nosy co-worker, there becomes less of a chance of

life permeating into the job, and anything out of the ordinary becomes more

noticeable.

This separation of work and life however, does not always end at five o'clock or even

when the high-tech professional heads for home. As the job of the high-tech

professional is linked to creative processes, companies often allow employees to work

flexible hours (as discussed earlier), coming into work should they feel inspired.

Along with this, English-Lueck discusses how work in high-tech can often colonize

life, whereby "The role of technology, and often the work associated with that

technology, is amplified at the expense of other roles – husband, father, friend. Once

the technology has been thoroughly intertwined, with family…[or personal lives]…it

has an impact on the shape of family culture."(2002:66). The danger then becomes

that employees are sometimes "…unable to turn off the emotional and intellectual

demands of work."(ibid:68), when at home.

Sometimes the problem of an open-concept office becomes *too much* personal space.

Natasha, upon graduation from university had begun work with what was at the time,

one of Canada's largest telecommunications companies. When massive layoffs came

and went, Natasha still found herself employed, but very secluded in her section of the

cubicle farm. More layoffs came about, and Natasha was again one of those that

remained, however, her area became an almost ghost town, with members of her

group strewn among different floors and buildings of the campus rather than among

the different cubicles around her. Natasha was happy that she had kept her job over

the many trials and tribulations of the company, but felt that many talented people had

been unfairly let go due to company seniority policies. Not only this, but with each

subsequent layoff, she would feel more and more lonesome and weary of what the

future held for her career. At one point, there were so few people around her that she

took up the habit of playing her music over speakers, and occasionally singing along

with the lyrics, without any worry of disrupting others around her. Eventually, the

company consolidated its employees into one building in the Montreal area and

Natasha found herself with company again. In this instance, too much space made for

a lonely and depressing work environment when the open-concept office was empty –

not the buzzing inspirational environment that they are structured to be.

5.2.2   Individuality and personalization

Another topic that emerged in discussions with the high-tech professionals, was the

issue of individuality in an open-concept work environment. Frank in particular

brought up the concept of feeling like a *worker drone* at times –feelings, also echoed

by others I interviewed as well.

At the time Frank was interviewed, he was a member of a ten-person hardware

engineering team that was one team out of many working to develop new video cards,

that would signal his company's dominance in the video field. As discussed before,

his cubicle and those of his team members, were housed in a warehouse like building,

that had row upon row of cubicles. The ambiance of the space was characterized by

relatively low lighting, little natural light and the hum of computers and other

equipment that was so constant that it became a sort of white background noise. With

so many people's workspaces housed in one place and so many people all working on

small parts of a much larger project, Frank often felt that what he developed didn't

really make a difference. He felt "...like one of those Borg drones from Star Trek...",

just part of a collective but never truly aware of the whole – assigned tasks which may

seem trivial at the surface, but that can be essential to the proper functioning of the

final product.

As Frank's case demonstrates, another of the perils of the open-concept office can be that it robs the professional of a sense of individuality, a sense of importance, within the greater scheme of the organizational whole. In contrast, an openness of management to the personalization of an individual's workspace can, as Tim describes, help to overcome this sense of being 'common'. In his first job upon graduating from university, Tim's direct supervisor was a staunch believer in the old adage "a happy worker is a productive worker". He felt that one of the ways to make his team feel as if they belonged, was to allow them to personalize their cubicles, provided that nothing posted or placed on display was derogatory or offensive. In his own cubicle, the supervisor even kept a cappuccino machine and would often treat his team to a 'good coffee' break at his cubicle. Others in the team would post cartoons or jokes on the outside of their cubicles for others to comment on as they passed by, others would hang up photos, or their children's paintings. This personalization not only allowed the employees to feel comfortable and themselves when in the office, but fostered an open dialogue on a more personal level among the team members, who would go to check out so-and-so's new poster, or the newest baby photo.

5.2.3   Ownership

One of the features of any culture, is that they can evoke a sense of pride and belonging – this aspect of culture is no different for organizations. In this sense, employees that feel as though they are true participants in the company, can feel as though they own a portion of the company's successes (or failures). As will be discussed at greater depth in the next section, a sense of ownership can also foster a sense of attachment in employees to the companies they work for, and this attachment

leads employees to feel a greater sense of company loyalty helping to mitigate turnover and job dissatisfaction.

This may also be an explanation for why the high-tech professionals I interviewed seemed to define themselves more in terms of what they do in their personal lives rather than their professional lives (to be discussed in more depth in the next chapter). As high-tech companies are faced with higher turnover rates due to occupational culture factors (to be discussed in depth in a later chapter), and industry conditions – analysis of the work environment as influencing factors on this turnover of employees becomes increasingly important.

5.3   Mediating work in an open-concept

With so much going on around them, it would seem difficult for anyone to concentrate when working in an open-concept environment. Many of those interviewed however, had interesting coping techniques to be able to overcome the planned chaos of their work environments. Two techniques in particular were mentioned by many of those interviewed, and were referred to as *Zoning Out* and *Flow*.

5.3.1   Zoning Out

For many of the professionals I interviewed, the chaos and interruptions of the open-concept office did not seem to especially faze them – mentioning the technique of zoning out in order to get their work done, through the use of headphones and music.

As Michael related, the open space, lack of privacy and loudness of so many people without barriers proved easy for him to tackle, as "...it was like that where I worked in [before]... I would just put on my headphones and listen to my music. Then I would get my work done. It was only hard to talk on the phone, but other than that it was normal."

The method of zoning out (used by almost all the respondents), was interesting in that personal space was produced by limiting the sense of hearing. In doing so, they were able to isolate themselves from the work environment around them and concentrate. Assam, Jay, Tim, and almost all those who did a significant amount of programming as part of their jobs, also mentioned the efficiency of this technique to get their work done.

Interestingly, Tim recounted having become so used to listening to music through his earphones while he worked, that he continued to use this technique of zoning out before even hiring employees for his own company! Assam related using headphones and music to get his work down since his university days, where he would spend many days and nights at the university computer labs. As the labs too, were an open concept layout with computers laid out on rows and rows of desks – Assam had first begun using headphones to drown out the clicking of keyboards less than a metre away from him on all sides.

5.3.2 Flow

Once able to zone out, another interesting work pattern attached to high-tech can then emerge. Both Frank and Balint in particular, described a good day on the job as being in the *flow*. Many of the professionals interviewed used this same term or a derivative of the term. In discussing flow with one of the professionals I interviewed named Frank, he defined it as being "...a state of mind that programmers get into. I guess it's just a groove that you get into – where you can sit in front of the screen for hours... it just feels like a couple of minutes. The work and the keyboard just become a part of you, it just flows, it comes naturally." According to Balint, flow is a state that most coders enjoy and try to 'get into'. "What sucks is when you don't have the kind of place to work where you can get into the 'flow'. You can't do as much when you're not in it."

With the concept of flow in mind and the intricacy of programming languages increasing with each passing year, is the open-concept necessarily the most productive environment for coding? Is there really that much need for the control and surveillance of high-tech professionals by their managers in order to get high-tech products out to market or would a full leap towards more traditional closed-office structure be more beneficial to the organizational cultures and employee productivity?

6.0   IDENTITY AND CAREER

The construction of culture is used by humans to make sense of the world around us,

creating distinct sets of meanings and order help us to that end (Trice, 1993: 20).

Occupational culture in this case, can be defined as those sets of beliefs, norms and

cultural forms that allow us to navigate our work lives (ibid). The underlying

components of any occupational culture can be seen as: (1) esoteric knowledge and

expertise; (2) extreme or unusual demands; (3) consciousness of kind; (4)

pervasiveness into the non-working life; (5) ideologies that confer favourable self-

images and social values to the tasks; (6) the extent to which members of the

occupation are members' primary reference group; and (7) the abundance of

consistent cultural cues – all of which contribute to facilitate group identity among the

members of the culture (ibid: 26). First and foremost however, the groupings of

individuals into various occupational cultures, tends to be associated with a person's

educational background or their occupational titles (Trice, 1993:26).

As mentioned before, when seeking out people to participate in my interviews, I

looked for two main things. The first of these was whether or not they worked in the

field of high-tech. While the term high-tech can encompass many different types of

work, for my purposes, respondents' jobs had to touch on some form of software or

hardware development. The second of the criteria was their training or educational

background. I tried as much as possible to interview those who had completed

university with degrees in either computer science, or computer engineering. The

discussion of occupational culture that ensues, is therefore based on these roots, these

initial shared characteristics.

6.1 The 'Coders', 'Managers', 'Teachers', 'People-people' and 'Geeks'

"They're like programming gods – they can do anything with a computer..." Balint description of some of his 'geek' co-workers.

Emerging from talks with professionals in the field, it would seem that occupational culture within high-tech can be split into three different roles, namely, *coders*, *teachers* and *managers*. These divisions, can again be linked back to the concepts discussed by Castells, Sennnett, and Sassen concerning the new realities of work in the network economy. Each of these 'titles' bestowed upon the high-tech professional, can be linked to nodal networks, where each of these positions is a node in the network organizations. Linked particularly to Sassen's discussion of the producer or specialized services, these positions could be filled by a myriad of potential employees or consultants that fit that particular description. Furthermore, within these three groups, it would also seem that there are two personality types that surface – those who see themselves more as *people-people* and those who see themselves as *geeks*, with many permutations between the two. These personality types could in turn be seen as further nodes in the organizational network, where different types of combinations of coders, managers, or teachers with either more people-people or geek leanings, would be required for any given position within the network organization. All the descriptive titles shown in the below organizational chart, came about through terms used by the professionals themselves in our talks.

Occupational Culture Flow Chart

Interviewees
Underlying Criteria
1. Working in High-tech
2. Computer Engineering or Computer Science Degree

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        Teachers              Coders              Managers

  Geeks    People-     Geeks    People-     Geeks    People-
           People               People               People
```
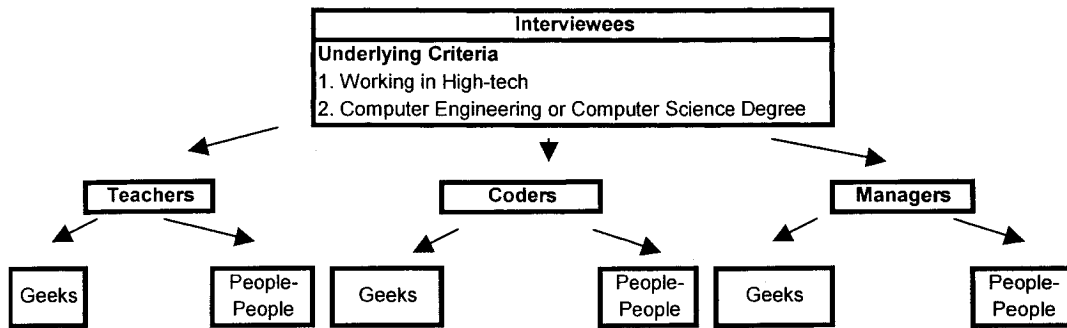
6.1.1 Coders

Among high-tech professionals, coders make up the largest part of the population.

The vast majority of high-tech professionals begin their careers as coders or

'programmers', and then as their careers progress, move into positions as teachers or

managers. The coders are on the frontlines of the technology race – they must be fast

and efficient at what they do, and are essential to the realisation of any high-tech

company's product development and product realisation. Coders write and develop

the software or hardware, usually as part of a larger team of professionals all working

towards the development of some new technology. They must be highly versed in a

variety of computer languages, as their projects may require them to complete some

tasks in one computer language, and others in a completely different format. Coders

essentially encode or program the ideas of their teams, manager, or clients into a

format that the computer understands, in order to produce new and innovative

products.

"...the way it works is that I'm assigned a part of the hardware to code..." Lex

recounts. "I'm basically told when it needs to get done by and then I get to work." In

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instances where others are assigned to the same task, meetings and coordination are needed – which falls into the realm of responsibilities of the project manager.

6.1.2 Managers

Project Managers find themselves a step up the decentralized corporate ladder from the coders. They often began their careers as coders, and after a few years of experience and success under their belts, they were entrusted with their own teams and projects. The high-tech project manager must have a strong technical base, as they are often the liaison between the coders and those with less technical savoir-faire such as their clients or marketing personnel and others in direct contact with customers and consumers. The role of project managers is essential in this respect; in that they are translators between the technological side of any project and those for whom the technology is being built. As will be discussed a bit later when looking at the people-people and geeks personality types – managers tend to be more of the people-people type, in that they must have good social and communicative skills in order to complete their tasks on a daily basis.

"There's a lot more to think about..." Richard a coder recently promoted to project manager explains, "...you have your own deadlines to meet, and everyone else's to look after too..." "It's more interesting then just coding though...I have more of an idea of the big picture now...before it used to be 'do this, do that' for a project deadline, now I'm the one who has to make sure all the pieces get done on time..."

Managers often have the added function of falling into the role of a teacher. This role can take the shape of introducing their groups to new programming languages, or new methods that need to be used in their project development, or in the form of demonstrating their projects at trade shows or to clients, other managers, and the higher echelons of management within their companies.

6.1.3   Teachers

While the managers and coders focus mainly on the innovation and development of new technologies – the role of the teacher differs slightly. Their focus is centered more on gaining and passing on a thorough understanding of the technologies once they are established as feasible for use on the market or for further development.

Teaching is a role that continues to grow within the high-tech field. As technology evolves, there are always a few front-runners that must teach the coders and mangers how to work with a new technology, or a new computer language. Teachers facilitate the assimilation and application of the new technologies by the coders and mangers, into their projects. Teachers can also find themselves in the role of bridging the technological gap between laymen and high-tech. Often, a teacher will find themselves giving product demonstrations at trade shows, presenting at conferences, and attending seminars in order to refresh and update their skills to eventually pass on these skills to others in their companies or their clients. Sometimes they can even find themselves in the position of an expert in a particular domain, as was Sam's case.

Sam spent a few years in a number of meaningless jobs after completing his CEGEP

degree. While a decent student, his years of schooling had left him wondering what

to do for the rest of his life. He finally decided that the future of his career lay with a

professional technical degree in computer security. Learning the in-and-outs of

security protocols was a daunting task, but after an intense year back at school –

Sam's certification was complete. Five companies and many promotions later, Sam

finds himself an expert in his field, managing his own team that offers complete

computer security systems analysis and implementation to their clients. He also finds

himself an accomplished author – having published three books on different security

protocols. Lastly, Sam finds himself teaching clients and other professionals in the

field about how the security protocols function and their new permutations.

Within each of these roles (coders, teachers, managers), it would seem that two

personality types materialise to varying degrees, among those working in high-tech

(see occupational culture flow chart). These two groups can be generalized into the

geeks and people-people.

6.1.4   Geeks

While the term geek is generally seen as having negative connotations; in high-tech

the term has a very different meaning. Cinema and mainstream media, often associate

Geeks with the terms, 'nerd' or 'drip', evoking images of males and females with

protect-protectors, heavy rimmed glasses, bad side-part hairdos and high-pitched,

snorty laughs. While some of these traits may hold true when looking at the 'geeks'

of high-tech, the perceptions of them within the domain itself are quite different. The

term 'geek' is used in the same vein by Kelty in his study on the perceptions of the

Internet, by high-tech professionals entitled *"Geeks, Social Imaginaries, and*

Recursive Publics" and is by no means derogatory in nature, but quite the contrary.

The geeks of this study and Kelty's are by no means those stereotypically depicted by

the media, but are instead likened to masterminds in their field.

As mentioned before, one of the common criteria shared among those I interviewed,

was that most had graduated from university with a degree in computer science or

computer engineering. This is of interest, in that most of the people interviewed that

qualify themselves as high-tech professionals, had gone through a significant amount

of scientific training and schooling. And most of those interviewed, already viewed

themselves as having a leaning towards 'geekiness' because of this scientific

background.

Among those in high-tech, the term 'geek' has come to describe a grander-than-most-

aptitude for interaction with the computer – a genius of sorts. Those termed 'geeks'

have an incredible knack to mould and shape code into whatever their projects

require. They are master linguists of programming languages – easily, almost

innately navigating the intricacies of the many dialects and languages their computers

'speak'. They are the magic-makers – those who make customers' and the markets'

whims a reality. Rather than being taunted and laughed at; among high-tech

professionals, the 'geeks' are highly revered.

"...these guys were like geniuses..." Balint related, "...they could do anything on the

computer...it was amazing." Defining himself as more of the 'people-people' type,

Balint's respect for the 'geeks' was unmistakable "...if I didn't have them around to sound off on or to ask questions, I wouldn't be able to get my stuff done as quickly – they're programming gods!"

6.1.5 People-people

The main difference between geeks and people-people lies with their interpersonal skills. While geeks may be highly revered for their technological savvy; they are not known for their interpersonal and communication skills with others. They may be well versed in C++ or Java, but relating to others in their groups or exchanging information with them becomes a more daunting task. This differs from the people-people in that, people-people have an easier time at communicating with other human beings. While still technologically able, people-people seem to be able to bridge the laymen-technological gap with less difficulty, than do their geek counterparts.

While it would be simple to portray the world of the high-tech professional, as three role types and two personality types within these roles; as with most things in life, it is not quite this black and white. Many high-tech professionals find themselves in a very grey zone between both their roles in the industry and their type of personality. And of course there are always exceptions to the rule – one may be a geek by all technological wizardry standards, but still be able to hold a lengthy conversion with any one on world politics or which movie star is dating whichever other movie star. However, in general most of those interviewed and observed could quite easily define themselves or fit into the roles of coders, managers, or teachers, as well as having more leanings towards being a geek or a people-people – although as the later section

will discuss, the high-tech professional cannot solely be defined by their work – free-

time is also of consequence.

6.2   Market Crashes and Professional Insecurities

"The rise of Netscape, Yahoo!, America Online, Microsoft and other Information Age
companies illustrates a modern day fact of life: traditional economics is ill equipped
to describe valuation in the age of information. After all, what is the value of data?
When data is organized into information, then what is its value? Information may be
manufactured and packaged like other goods, but it isn't valued like a loaf of bread or
a box of cereal."(Lewis, 1999, 271)

A little over a year later, these valuations would drop drastically as the dot-com

bubble burst, and many within high-tech found themselves jobless with worthless

stock options in the bank. Unlike the recovery of the western economies after the

great depression and the Second World War, which relied on the adoption of social

welfare measures such as minimum wages and workers unions, the rebirth of high-

tech after the industry's crash, has left many professionals with insecurities about the

future of their jobs. These insecurities have led to development of trends such as *job-*

hopping (to be discussed in a following section), and a re-jigging of identity to be

based less on work, and more on free-time undertakings (also discussed in more depth

below).

6.2.1   Conditions for insecurities

Many of the professionals I interviewed expressed concern about the routes that their

careers would take until they (hopefully) retired. As discussed in the chapter on

innovation; the high-tech workforce is forced to constantly push forward – whether it

be pushing the technology itself, or themselves to cope with the often-changing

technologies and work environments. As a consequence, it would seem that the high-

tech professional can never be professionally at rest. Balint and Jay's interviews were

particularly representative of this insecurity within the field, echoed by many of those interviewed.

Balint had spent his first three years after graduating with a bachelor degree in computer science, working for a software engineering firm. Balint felt a strong connection with his co-workers – often, he would meet up with co-workers on week-ends and after work for suppers or a drink. With such a friendly environment, Balint also possessed a strong loyalty to his company – unfazed by the long hours and extensive travel required of him. The day came however, when the company was forced to downsize its workforce and Balint was let go. Devastated by the loss of his job and by a number of friends/colleagues having to move to other provinces, states or even abroad to find employment – Balint was forced to deal with the insecurity of the industry for the first time. After a few months, Balint was able to find a job through an old colleague with a small start-up. Balint made up the third member of a team of three including the founder himself. At this new company, Balint now felt more of a sense of control over his future – the founder of the company worked the same long hours he and his co-worker worked, and was open to discussions of how to improve their projects and methods of development.

The tale related by Balint, becomes more interesting when looked at in the context of recent management literature concerning occupational cultures and high-performance organizations. In McKay's '*Securing Commitment in an Insecure World*' (2004), he discusses the importance of worker loyalty to the success of any firm. "Loyalty is particularly important because it builds mutual trust and drives workers to participate

in problem-solving. Loyalty is most influenced by positive incentives and

promotional opportunities." (McKay, 2004: 378-379). In establishing the loyalty of

its employees, companies have a greater chance of securing their employees' effort or

the willingness to work hard, as well as employee attachment or their intent to stay

with the company (ibid). As Jay's case to follow illustrates, job security is an

important component of employee loyalty, effort and attachment to towards one's job.

Upon graduation from university with a degree in computer engineering, Jay found

himself a victim of the Tech-Stock crash, holding a worthless employment contract in

his hands. He immediately applied for a Masters degree in computer engineering as a

means of expanding his expertise while waiting for the industry to pick up again.

Sure enough, after completing his second degree, employment opportunities began

popping up, and Jay accepted a short-term contract with a large aeronautical firm.

After completing that contract, he found himself again looking for a job, and found a

position with a government scientific institution. Now a few years into the

government job, Jay recounted feeling lucky to have a job that is both challenging

from an innovative and technological perspective, but at the same time has the job-

security built into it that he was unable to find in his previous jobs in the private

sector. This new government job affords him the chance to begin planning for the

future – having recently purchased his first home as a consequence.

In order to cope with the employment insecurities found in high-tech industry, high-

tech professionals employ the practice of job-hopping and have a tendency to

construct images of self around free-time rather than work-time endeavours.

6.2.2 'Job-Hopping'

Linked to the job insecurity within the field of High-tech, as well as the constant flux of the industry's technologies themselves; is the trend of *job-hopping*. Many high-tech professionals use job-hopping purposefully or inadvertently as a means for career and salary advancement, but also as a means to have more control and a sense of agency with respect to their career paths.

As pyramidal hierarchies discussed in an earlier section, are replaced by looser networks – people who often change jobs can experience what is known as 'ambiguously lateral moves' (Sennett, 1998, 85). These are moves in which a person in fact moves sideways even while believing that he or she is moving up in the loose network.(ibid) In the end however, any occupational risks of this sort, are in the end based on whether or not the individual will earn more money (ibid).

Within High-tech especially, there seems to have emerged the feeling that to remain attached to a certain type of work or to a certain company for too long translates to an obsoleteness of sorts in one's skill set. As mentioned previously, the industry itself is rooted in the values of innovation and an ever-widening knowledge base. These values also filter through to the occupational culture. As compared to the prospects of lifetime employment experienced by many of the baby-boom generation in Canada; it has now become accepted and even expected, that high-tech professionals will change jobs and companies every couple of years. Tim's history demonstrates this 'need' for change.

Tim has been running his own software engineering firm since 2002. Having been

previously been laid-off from his job with a large software and hardware development

firm – his own company grew through word of mouth. Tim's company develops

custom video software for their clients, expanding to include two other employees in

its first year. While the first two years of the business were a success, Tim's last two

years have been more difficult – having let go of his staff in order to stay afloat.

While he would have enjoyed continuing to work for himself, Tim decided that it

would be better to develop his skill set by working for another company. "I don't

want to become unmarketable...I have so many ideas for products, I just can't do it all

on my own..." In order to expand his skills and increase his salary, Tim decided that

his best choice was to look for employment with another firm as a project manager.

Kotamraju reiterates the importance of reskilling, whereby "[i]nformation technology

and it's accompanying work structures propagate a system in which workers must be

ready to update their skills as quickly as new technologies are introduced."(2002, 1)

This mimics Sennett's findings in *The Corrosion of Character* , where the high-tech

professional must be flexible on many levels "...facing job insecurity..., variable

work schedules, and constant readjustment to new, digital technology."(ibid), in order

to survive in the industry.

Tim's marketability of skills approach for job-hopping echoes Jay's earlier discussion

of having found job security in a quickly changing industry. Where Jay's solution to

the insecurity of the high-tech industry was to find a job in the public sector; Tim's

solution for job security in the private sector of high-tech, was to ensure his

marketability to other firms, therefore (hopefully) protecting his career path through

making himself a 'hot commodity' on the job market due to this superior skill set.

Throughout the course of interviewing, another pattern attached to Job-hopping also

began to emerge. Many of those I interviewed had begun to use job-hopping as a

means not only to improve their skill bases and as job security, but as a means to

climb the 'corporate ladder' and increase their salary scales. It was not uncommon

for most of those interviewed to have changed jobs and companies a number of times

in the last five to ten years, and as Assam's story to follow exhibits, this strategy can

be effective even in a short span of time.

'Job-hopping' Trends: Number of company and job changes per person interviewed

Person	Company Changes	Position Changes
Assam	4	1
Balint	2	1
Frank	2	1
Jay	4	2
Joséphine	0	3
Lex	3	2
Matteo	3	0
Michael	3	0
Monique	4	1
Natasha	0	2
Richard	2	1
Sam	5	2
Tim	1	1
Tom	2	0

(Time-span = 5 to 10 years)

Assam started off his career working for a major aeronautical engineering firm as a

coder, developing software related to flight simulations. He had worked for the same

company during his university summers, but after working for them for two years

since graduating; it was time for a change. He did not see any immediate possibilities

for career advancement, and was afraid that if he stayed with his current employer, his

career's upward mobility would stagnate. He quickly found a position at another firm, dealing with similar programming. While still considered a coder, this new position was a step up from his old position enabling him to travel from client to client for the next two years. Constant travel began to take its toll on Assam and he decided to search for something new yet again. This new position was again as a programmer. The work environment was more employee friendly than those at his previous two jobs, so that Friday afternoons ended at 16:00 for beer and snacks, and breakfasts and gourmet coffee were provided daily. Assam also enjoyed living in Montreal full-time. Unfortunately, Assam was laid-off in a company-wide downsizing after only a year with the new firm and was forced to begin yet another job-search. After about a month's time, he was able to find a new position in a completely different field; this time a step up as a project manager, dealing with financial planning and management software.

Along with each of these position and company changes, Assam also experienced an increase in his salary – indicating as stated before, that job-hopping can be used as an alternative to the traditional corporate 'ladder-climbing' career path popularized in more traditional, hierarchically structured companies.

Another important component to job-hopping is the interpersonal networking that is involved with finding that 'next job'. Relationships with co-workers become increasingly important, as one never knows when they may be laid-off or find themselves clamouring to work on something new. In this sense, it is prudent to have a large network of friends and sociable co-workers within the industry that you can

call on when the search for the newest job begins. These networks can be local or

even international in scope – but, managing these networks of people is integral to the

development of the high-tech professional's career.

In their 2002, article entitled 'It's Not Only 'Who You Know' That Matters',

Huffman and Torres conclude that "...who you know clearly matters...[R]espondents

with relatively high levels of occupational experience and who work many hours per

week received higher-quality leads [for future job opportunities] than other

respondents...reflect[ing] the advantaged positions of these respondents' job lead

providers."(808)

Assam's job-hopping patterns were discussed earlier in this section, but another

fundamental factor to the success of his company switches, was his professional

networks. At each of the companies that he moved to, Assam had a personal contact

or a contact-of-a-contact in place to help his case, or inform him of new positions

coming up among various companies in the Montreal area. These contacts become

even more interesting at companies that offer recruiting bonuses to employees who

introduce or find new employees for the company. Who you know in both instances,

can become profitable in and of itself.

Sam's networks were even more complex, spanning international borders. Making

his home in the Montreal area, he recounted planning vacations to go and visit

contacts in the United States, other regions of Canada, and his most recent gallivant to

Switzerland to visit an ex-co-worker. "...you need contacts, they're very important.

You never know where you'll be in a year...you need to have people in places to go to should your situation change." As can be seen from the chart referring to job changes and position changes above, Sam has had many occasions in the past few years to test his networks.

The importance of networks in finding that next job is also reiterated by Peterson, Saporta, and Seidel's *"Offering a Job: Meritocracy and Social Networks"*(2000). While these networks may take many forms, their primary function is to provide information about opportunities to job seekers and about prospective hirees to employers (ibid, 769). Their study of a mid-sized high-tech firm found that of 35,229 applicants to the company, personal and professional networks accounted for 60.4% of these applicants, and more importantly, 80.8% of those receiving offers.(ibid, 810)

6.2.3 Free-time versus work time...

When trying to organize interviews with high-tech professionals, one recurring problem was that most of those interviewed had very scheduled lives after work. At first I thought that the professionals I was contacting were not really interested in participating in the research. Interviews often had to be rescheduled in order to accommodate late nights at work, and other obligations such as sporting events, art and dance classes. After the first two interviewees insisted on rescheduling and rescheduling their interviews, I realised that in fact, they were intrigued by and committed to participating in my research – but that they had many recreational obligations after the work-day and work-week ended. It was not uncommon to have to reschedule an interview two or three times. Josephine and Richard were prime examples of this work-play trend.

Josephine is the manager of an internet technologies software development group for

a large telecommunications corporation. In the past two years she found herself

travelling on an almost weekly basis between head-office in Toronto, and her home

office in Montreal. Although she was able to make it home on the weekends, the

constant travel was beginning to take a toll on her leisure time and family obligations.

In order to cope with the travel and longer hours spent at the office in Montreal when

she was in town; Josephine had to cut down on many of her extracurricular activities.

Josephine's free-time was highly scheduled – she would play soccer two to three

times a week in a recreational women's league; had signed up for a half-marathon

running course which required a minimum of three days training a week; and still

managed to visit her parents and her sister's family on the week-ends. Keeping busy

when away from work was her reward for working such long and hard hours, but as

the long and hard hours increased; the balance of the rewards diminished.

Organizing an interview with Richard was a daunting task. Having rescheduled four

times due to work, family and recreational obligations; Richard apologized profusely,

stating "...my whole life is scheduled...otherwise work would take up all of my time.

This way, I can tell my boss that I have another engagement or appointment with a

clean conscience!" Among his extracurricular activities were volleyball a few nights

a week in a co-ed league with his fiancé, a complete renovation of his home, and

countless evenings and suppers out with friends and family. With all this to

accomplish in his free-time, Richard had recently been promoted to a team manager

position, which afforded him a company cell phone as a perk – however, the

responsibilities of this new position also meant that the office could now call him on

that cell phone during his time away from the office.

This tendency seems to hold true for most of the professionals interviewed – Frank

teaches dancing; Monique plays tennis in a league year-round; Assam boxes; Matteo

is a DJ at nightclubs and friends' parties; Natasha figure skates three times a week and

teaches children how to skate another two days a week – the list of activities goes on

and on. The larger question then becomes why? Why are the personal lives of these

professionals so highly scheduled and structured?

One possibility for this 'free-time' structure is offered by Dryburgh in "Work Hard,

Play Hard" in 1999, who suggests that it may be the result of the professionalization

process. Dryburgh postulates that there are perhaps three main aspects to the

professionalization process: adapting to the professional culture, internalizing the

professional identity, and demonstrating solidarity with others in the profession.

While studying engineering students, Dryburgh discovered that there was a perception

that they would "...play hard because they work hard... support[ing] the notion of the

hard-working, dedicated engineer who meets the heavy demands of his or her

profession and unwinds with intensity and energy."(1999). It would seem that the

social lives of the high-tech professional interviewed for this study (many of which

are engineers by training), appear to follow this model of working hard to be able to

play hard. This would seem to indicate that play is more important for those

interviewed – however, one could also contend that the two are components of one

identity both on and off the job; the idea that one is hard-driving regardless of task. In

this sense, it may be a means of dealing with the anxiety of insecure employment while at the same time demonstrating that one is a valuable professional.

J.A. English-Lueck and Andrea Saveri offer another piece to the free-time puzzle in their article entitled "Silicon Missionaries and Identity Evangelists" (2001). Through their research they discovered that the work of high-tech is filled with uncertainty, and that in order to negotiate this ambiguity, professionals manipulate identity.(ibid) With such a quickly evolving work environment, this ability to morph ones' identity becomes an advantage of sorts at dealing with a rapidly changing work environment.

In not defining themselves by their work, but instead by what makes up their free-time, those interviewed like Josephine and Richard have developed a concreteness and consistency in their lives that they are unable to gain from their work environments. As such, their identities no longer become dependent on what company they work for, what type of language they program in, or what occupation they perform – instead their identities are based solely on parameters within the realm of their control – who they are when not at work. To be noted however, is that those interviewed also adopt strategies that make them desirable in the work-world.

Just as job-hopping has developed in the world of the high-tech professional as a control and coping mechanism for an insecure job market; the definition of one's self by extracurricular activities rather than by occupation, seems to also be a means for the high-tech professional to cope with the realities of their industry.

7.0   WOMEN IN HIGH-TECH

7.1   A different approach...

When looking at women in high-tech, one glaring truth presents itself: in many of the

professions linked to the sciences including engineering and computer science,

women's numbers are far fewer than their male counterparts. As Kelty points out in

his study of the Internet and the professionals that shape it, the only thing that seemed

invariable about the professionals studied, was that his informants were almost one-

hundred percent male (2005, 191).   This being said, of particular interest when I

interviewed with women, was what were their motivations for entering such a male

dominated domain were?

Through the course of my research, I was able to sit down with three women. The

paths to getting these interviews was far different than the referral system used for the

interviews with men – in the first example of Monique, I was complaining to a friend

that I was not receiving referrals for women from the other professionals and she then

recommended that I sit down with Monique. The other two women as will be

discussed, were acquaintances. In keeping with the different nature of these particular

interviews with women, I have changed the format of analysis slightly to use longer

excepts from interviews to demonstrate this different style.

7.2   Monique

It had taken a little less than two weeks for me to be sitting in face-to-face with her.

Monique had spent the last 3 years since graduation as an ex-pat working throughout

Europe and North America. Even when she had been working 'at home' it had been

more than 500km from where she was raised and her parents still resided.

While I had met Monique a few times in the years preceding our interview together, I had not recalled her talking about her career. She often spoke about her family, and would constantly reminisce with Julia about their years at an all girls' catholic school together. I vaguely remembered that she had graduated in computer engineering, but it was never the first thing to come to mind when friends would talk about her or when she would talk about herself. As was the case with my other interviews with women, she was flattered and wondered why I would want to interview her?

On a bright June morning, I found myself sitting with Monique in her parents' kitchen while she was having her hair colored by the family hairdresser – a friend of her mother's since childhood. I was catching Monique at a crossroads in her life – soon she would be flying to France, beginning a new job as a salesperson for a medical technology firm that developed among other products, a computer aided surgical system for orthopedics. She had spent the last 2 weeks staying 'at home' with her parents since leaving her job in Toronto for this new opportunity abroad. She had insisted that I come to interview her, and as time was running short (it was the Saturday before she was to leave), she thought that while she was having her hair done would be the best bet for a good 2 hours of her time!

While she couldn't pinpoint the exact age a computer first appeared in their home; Monique can remember using the computer for schoolwork from an early age. She recalls all of her friends being thoroughly impressed as she was able to use DOS commands and was allowed to use 'her parents' computer. None of this seemed out

of the ordinary for her, as she was never told she wasn't allowed to tinker on the

computer.

Aspects of equality were again reinforced as Monique began high school. Although

her parents had sent her to an all girls catholic private school; the headmistress of the

school was a very progressive woman who would challenge the girls to explore new

fields historically dominated by men. As Monique pointed out, it may not seem

unusual for a headmistress to stress these kinds of challenges for her students, but in

this case, "...the headmistress was in her early 80s and also a nun!" This particular

high school was one of the first in the Montreal area to integrate the use of laptop

computers in the classroom for all subjects on a daily basis.

Monique was inspired by the headmistress' message that women could accomplish

wonderful things within the scientific community, and knew that her main career

interests lay within the sciences. When entering CEGEP, she thought her future

would be within the medical field – she never imagined herself as a computer

engineer until it happened. In CEGEP, Monique found many others around her with

stronger academic credentials to get into Med School, and began to re-evaluate her

career choices. After writing personality, aptitude and interest tests – a career

counselor suggested three career possibilities where Monique would excel. These

careers were respectively, as "...a kindergarten teacher, a financial manager or an

engineer." She chose computer engineering.

Summers throughout university were spent working for a small transport software

company in the Montreal area. Although at university the split in engineering was

still not 50-50, there were still many more women to socialize with as compared to the

15 to 1 split of her new office environment (she being the 1). Her new boss would

often joke with Monique, that she "...had raised the conversational bar... not all

conversations revolved around sex anymore!" The work environment was a fun one,

where "...the employees would often play soccer together in the hallways, or go for a

'sports break' outside on the front lawn." While all the employees had their own

offices (a rare occurrence in High-tech for a small firm), Monique as the intern

"...unfortunately found [her]self in the hallway...", but didn't mind as it provided a

"...more social atmosphere..." for her, where she could chit-chat with passers-by.

She impressed her boss so much, that he hired her for all of her summers throughout

university.

The environment was 'very social', spurred by the founder's own personality.

Employees, as Monique put it, "...were not your typical 'geeks' at this company."

They sought out employees that had a "...good cultural 'fit', who were very

technically knowledgeable, but who were fun-loving,.." personable, and well-rounded

individuals, not to mention "...highly self-motivated to get their projects

completed..." in a timely manner. In return, the employees expected salaries that

were slightly higher than the industry norm for the time. 'Fun' and social fit were so

important to the company's founder, that he would organize "...quarterly outings to

water parks, paintballing, soccer games..." to name a few, in order to reward his

employees, and ensure they felt a connection to the company.

As seen in the chapter discussing the organizational environments within high-tech, cultural fit can be a predictor of whether or not an individual remains within an organization for a 'longer' period of time (i.e Job-hopping). In their 2001 report entitled *Unfinished Business: Women in the Silicon Valley Economy* the Women of Silicon Valley Organization (WOSV) explore the changing economic conditions facing women in Silicon Valley. This report describes the progress that has occurred in women's economic participation in the Silicon Valley and high-tech economy, as well as the attached pressures and missed opportunities that would allow for women to participate more fully in this economy. Also outlined were three predictors for the retention of female employees in high-tech positions, namely: satisfaction with development opportunities; the ability to achieve work/life balance; and lastly, fit with the company culture. With this, "...work practices, patterns, and norms prevalent in [high-tech] companies that seem neutral may subtly and systematically disadvantage and discourage women..."(WOSV 2001: 30) and these practices may be seen as being "...deeply embedded in organizational life."(WOSV2001: 30)

The importance of 'fitting in' can also be seen when looking at the professional socialization process attached to engineering. Not only have women in high-tech had to adapt to the male-dominated professional culture as a part of their training throughout university; but they must also internalize this professional identity (Dryburgh 1999: 664). The transition from education to occupation can be difficult for women in that their academic strengths are no longer valued to the same extent (Dryburgh 1999: 665). Knowing how to conform to the masculine culture and

adapting well can be seen as critical to a woman's success in the workplace, not to

mention demonstrating one's competence in the field (Dryburgh 1999: 665-681). As

Michael , another of the people I interviewed stated, "...the advice of women was

often second-guessed and needed to be supported or seconded by someone else..; a

man's opinion could stand on it's own even if it was wrong in the end." It would

seem that at his past companies and with his experience in the industry, that "...its all

about the 'ego', about who has the most clout, the most experience... those are the

people that are revered by others at the company..."

Monique's small firm experience was drastically different from her experience at a

'big' company. While waiting to return to Europe, Monique had spent the last nine

months before I interviewed her living in Toronto working for a large petroleum

company. While at the small firm as a student intern, there had never been a lack of

work to be done – working for this large multi-national was a completely different

issue. She found the levels of bureaucracy difficult to manage in order to push her

project forward, and would often find herself "...asking for more work while playing

the 'waiting game' for approval for [the] project..." she had been hired to do. At one

point she had "...even offered to clean-out her boss' in-box because [she] had no

other work..." and was turned down. As she stated – there were "...only so many

games of solitaire you can play in a given day!"

However, the socialization process at this large conglomerate was very structured.

Neophytes would find themselves in a week long orientation session, meant not only

to introduce them to the ins and outs of working and getting the job done in the large

firm; but to the history of the evolution of the company, including their mergers and

acquisitions. She remembers having been "...flown into Toronto, sharing meals and

lodging with a group of new recruits." Another problem with fully immersing

herself in the company culture, was "...that [she] would be leaving as soon as [her]

European work permits came through."

While Monique had been hired because of her background in computer engineering,

most of her job at the large multi-national was "...project coordination for a virtual

group all assigned to the same project." Her "...only other 'programming' co-worker

on the project was located in the Southern United States...", and their 'boss' on the

project was also in the US, but hundreds of miles away from both Monique and her

other group members. The tasks at hand were not only steeped in bureaucracy, but

impeded by very real geographic barriers. However, "...one very interesting thing at

this company, was that there were much more women working in High-tech... about

30-40%." At the time that she was hired, "...3 out of the 9..." new hirees, were

women.

While these types of percentages may seem low in comparison to other industries

such as management, law or the medical fields; there is more dismal news for women

working in high-tech. According to a recent study of technical women in Silicon

Valley "[t]he overall percentage of women who comprise the IT workforce is on the

decline, from 41 percent in 1996 to 32 percent in 2004."(Stanford Institute for

Research on Women and Gender: 2005) It would seem that less women are entering

high-technology careers, and less still continue on to take on leadership roles in the

field.(ibid) other studies have shown that "[w]omen's share of engineering degrees

has stalled at 20% [and] their share of computer science degrees declined from 33% in

1988 to 29% in 1997."(Women of Silicon Valley: 2001)

Monique had spent her years since graduating from the 'Polytechnique' working in

Switzerland and Toronto (discussed above). In her last year of University, Monique

had spent a term abroad in Switzerland and upon graduating she decided that instead

of just traveling to Europe, "...why not work there instead?" Through a bit of

research and networking with friends and acquaintances she had made in Switzerland;

she was able to find a position as an "...intern at a bio-medical research institute."

This environment was again very decentralized, where her new supervisor took a

walk with her around the different floors of the institute to introduce her to the other

40 employees. As the environment was geared towards research, the atmosphere was

far less social than had been her experiences at both her summer job and her time at

the large multi-national.

While her work was of great interest to her, "...the relaxed environment and no

deadlines at the research institute, left [her] very unmotivated." She "...wasn't really

able to get a clear answer to when parts of the project were due, and [her] co-workers

were just as nonchalant about their deadlines." There were also few women with

whom she could converse during her days – the "...institutes' was only about 20%

women." While this may seem a normal percentage for actual programmers at a

given company within the high-tech field; Monique's co-workers were spread out

among the many floors of the institutes' two very narrow buildings, making it "...hard to talk to anyone during the day other than your group members."

Interestingly, as the vast majority of employees at 'the institute' were from somewhere other than Switzerland, some of the employees bonded on a social standpoint "...which made the job more socially bearable!" While she did not come to be close with all the 40 employees, she did come to know the other members of her particular work group quite well. She "...often found [herself] meeting up with co-workers on week-ends and sometimes going out for a drink after work." Luckily, having studied for a university term not too far away from the city in which the institute was located, she also had another pool of friends to draw on.

Monique's propensity for travel and working abroad is interesting when compared to recent findings presented by Parvati Raghuram at the 2004 *Women's Studies International Forum*. Raghuram suggests that due to the travel involved with a lot of high-tech positions many women "...find it particularly difficult as their familial responsibilities often requires them to develop social links within the communities in which they work."(170) In this sense, Monique's willingness to move where there is interesting work, fits with the patterns of her male counterparts. Not surprisingly, this obligation to travel can "...negatively influence women's careers due to women's continued responsibilities to the household."(Raghuram: 2004). Along the same thread, the three women I interviewed were all single, and all had a large amount of travel attached to their jobs, on a weekly basis.

Monique's project with 'the institute' was a success. She "...was asked to speak at a few conferences and trade shows to present the results of the new project...", and because of her presence and warm personality, was offered a job with a sister company that financially supported 'the institute' where she was working. This new position was in France, but would be completely different from anything she had done before – this new position was in *sales*.

The choice Monique made to switch to sales seems rooted in the fact that she "...needs a more social aspect of her work [and] hates being stuck in her office all day long programming." She finds programming to be "...a lonely process." Although she enjoys the inventive and creative aspects involved with programming, "It takes a long time to become a systems architect with a team – working on designing the whole system with a team to manage." Monique is hoping that sales will offer her a chance to be challenged, but at the same time will give her the social interaction she is yearning for. This social aspect to work is a topic that came up not only when talking with Monique, but with the two other women that I interviewed.

Intriguingly, all three women that I interviewed also had a more social dimension to their work within the high-tech industry. As will be discussed more in depth later; both Josephine and Natasha partake in the role of 'interpreter' for their work groups. The social aspect to work life seems a key part for women who continue in the industry, whereby women when picking a career path may "...perceive that tech careers require a narrow set of technical skills and are socially isolating."(WOSV: 2001)

7.3   Josephine

Josephine manages a group that develops new software projects for the internet

business branch of a major telephone and internet provider in Canada. We had met

through a neighborhood running group, and paced together through many an evening

run. It was in one of our first conversations in one of these runs, that I discovered that

she worked in high-tech.

As she puts it, her "...job is to manage a group of geeks... To get them to build what

head office says we need to stay competitive." Her work involves both talking and

getting across the needs of the company to her group of programmers, and then

presenting those finished products to the managers at the head office of the company

in Toronto. Much of her job involves "...translating the company's needs into terms

that the group will understand..."

She started at the company as a teenager in her mother's department, working during

her summer vacations. Her "...mom was an inspiration... She started as an operator,

and worked her way up through the same company to being manager of her own

group... It showed us that it was okay for a woman to work and be successful..."

Following her mother's example, Josephine also worked her way up through the

company, moving up the seniority ladder with each passing year. It was just a matter

of time before she was offered a managerial position. The company structure made it

predictable that she would be given this type of promotion, as it had very drawn out

seniority based procedures that allowed its employees to map out their career paths within the company based on years of experience.

As a woman working within the high-tech field for almost a decade now, Josephine's perspectives on her success are quite telling. She understands why "...many women may feel uncomfortable with the geek aspect...", of high-tech and find themselves wanting to "...be able to communicate in a normal way." Interestingly, she calls herself fluent in 'geek speak', learning how to motivate her team in an untraditional manner. As she describes, "It's easy to get what I want out of them... I just have to tell them that I *understand* if it's not possible... [T]hey see it as a total challenge to their 'programming prowess'..."

Another contributing factor to Josephine's success in high-tech, is that she has never been deeply involved in the programming aspect of the groups she's worked in. "I have a basic understanding of the principles, but I'm there to make sure the project stays on track, to schmooze the guys and then explain the 'techie' side of things to head office and my supervisors." The majority of her interactions on a daily basis are with people, not the computer. "I wouldn't be able to do what they do... don't get me wrong, they're geniuses with the computer, but they can't hold a normal conversation like you or me!"

7.4 Natasha

One dreary Saturday afternoon between skating sessions at the local arena, (where I teach from time to time) Natasha and I sat in the dingy referees' room passing the

time until we could get on the ice. Busy with work, Natasha had missed her skating

practices the last two Saturdays at the rink – instead spending her highly valued

Saturdays traveling back from visiting clients during the week in Toronto. She had

called me from the train each week to postpone our interview. Working since

graduation for one Canada's largest telecommunications firms, Natasha's job involves

relating clients needs back to her team of problem-solvers, and bringing those answers

back to the client.

While she enjoys her work, the isolation and disconnection from her team that she has

experienced due to large-scale downsizing and frequent travel, has been hard to cope

with in over the last 7 years. While "...always thankful that [she] keep[s] her job

when the company is re-structuring...", she hates the "...stress of working in that type

of uncertain environment." Not only this, but it would seem that "...there is no room

for moving up, I've been in the same job since I started." Working for a large multi-

national may have it's downsides, "but in general it's been a rewarding experience..."

for Natasha. "I loved it there when I first started... It was fun and exciting right

before the dot-com crash. I still don't know how I haven't been cut. There were

other co-workers of mine that were more talented that were cut but I wasn't... But I

really feel that my job fits me..."

7.5   Women, is there a difference with the men in high-tech?

Both Josephine and Natasha work for very large firms and have stayed in their

positions for longer than the high-tech average (which in the case of the other people

interviewed had been roughly every 2-3 years). It may be hypothesized that

established 'blue-chip' firms tend to have more progressive programs ensuring that less gender-discrimination occurs in their hiring processes. Human resource policies such as quotas to ensure employment equality, and internal mobility based on seniority may also be seen as helping women move forward in the bureaucratic firms in the high-tech industry. Another possibility is that these types of larger firms offer their employees a broader career structure and internal range than the typical small to midsize high-tech firm, which allows for less of the 'job-hopping' (discussed in section 6).

However, as explored by Ranson and Reeves, it would seem that high-tech companies that hire relatively more women than the industry norm, tend to choose those that are less well educated and less experienced than their male employees (1996:168). It would also seem that in "...organizations with proportionately fewer women, the women who are hired are, on average indistinguishable from their male colleagues in human capital terms."(Ranson et al. 1996: 179) This type of equality despite the low ratio of female versus male employees, can be seen in the example mentioned of Monique's first summer job. Though not overtly stated, the impression Natasha gave was that she was of the first type of female employee – feeling that she had been spared lay-off after lay-off in order to preserve some sort of gender ratio (this may be linked to emotional factors and issues of self-confidence).

The larger firms may also have an easier time in dealing with employee commitment issues. As Singh and Vinnicombe explore, "...women [are] seen to have different commitments based on their social roles, women deriving their identity more from

their family than their work role."(2000:4). Again relating back to more formal human resources practices concerning time off and flex-time, larger firms have more resources to dedicate to dealing with the effect of gender disparities. Interestingly, Singh and Vinnicombe also found that the women engineers in their study had a "...composition of commitment with a stronger organizational orientation than given by the male[s]..."(2000:17). One could then contend, that maybe the larger high-tech companies have come to realize this organizational commitment held by their female employees – both Josephine and Natasha enjoy their jobs and have not jumped on the job-hopping bandwagon. The act of job-hopping as described before is disaggregating in its nature – could it be that men are better equipped by some means to cope with this type of alienation?

Another factor influencing the low number of women in high-tech companies, could be a concept touched on throughout the whole of this chapter: the social dimension to work. Both Natasha and Josephine have more 'social aspects' to their jobs interacting with their groups and superiors, or clients on a daily basis. For both, this was one of the aspects of their jobs that they talked the most about and cited as being one of the reasons they enjoyed their work.

While at a party last year with a few graduates from computer engineering, one out the two other females there (the other 10 were men), also mentioned a recent career move to a technical sales position at a large multi-national computer retailer. She explained the move as being uplifting in that she now had contact with the 'outside world' whereas before she felt "...trapped in her cubicle day after day...". The

example of Monique and her new position in sales could also be seen as contributing

to this theory, as she tries to find the 'social side' to high-tech.

Another possibility is that the work and personal networks essential to job-hopping

may not be as explicit for women as they are for men. As Petersen, Saporta, and

Seidel explore in their study of social networks and hiring practices within high-tech –

one reason for potential male advantage at establishing networks, is merely men's

more extensive attachment to the labor force, giving men more opportunities to

construct both personal and professional networks (2000, 769). However, when

comparing the networks used by Monique to gain her latest work position in Europe –

her networks would appear as strong as any of her male counterparts in this study.

Is there a concrete difference between the men and the women that I interviewed, as

they participate in the organizational and occupational cultures of high-tech? The

cases presented as representing women in this study would lean towards no such

difference. The women interviewed used the techniques described before of job-

hopping, networking and scheduled free-time – but what they all seemed to want from

their jobs more then any other element, was a social aspect to their work, rather than a

purely technical role in high-tech.

8.0 CONCLUSIONS

As stated in the introduction of this thesis, high-tech professionals find themselves 'nodes' in many different but interrelated organizational and personal networks, some of which affect their work lives directly, and others, which affect their sense of who they are as products of the 'network' society and employees of 'networked' organizations. One of the points of interest here, lies in the fact that any changes to one of these networks that shape the high-tech professionals' perceptions of work and self can seriously alter all of the other networks attached to the professional. In this sense, the high-tech professionals that I interviewed are in a delicate balance, where the lines between work-life, home and one's identity is in a state of flexible production itself – forced to adapt to new economic, and informational conditions at an ever-increasing pace. What has been discussed and is of interest, is how the high-tech professionals I interviewed dealt with being mere (disposable) nodes in a networked society – nodes in the global network of production, nodes in the structures of their companies, nodes in the networks of their work colleagues, nodes in a greater network of professionals, nodes in personal networks.

8.1 Reorganization of work

With the onslaught of the information age and the assimilation of the value of innovation; the new and burgeoning tech companies have opted for a newer and more decentralized model for their organizational structures – a more flexible working system. While these types of organizational structures may be highly functional at a small scale, the tech companies grew quickly, and their organic structures had difficulties in coping with large

numbers of employees. In this sense, the companies that those I interviewed worked for,

developed hybrid organizational structures that were both bureaucratic and in keeping

with the flat organizational models of the network economy – i.e. neither fully centralized

nor fully decentralized. With this, the cultures of the high-tech organizations were not

equipped with, nor developed cultural practices to help mitigate growing frustrations in

the professional ranks that were/are still partially rooted in the mindset of employment

for life, despite the new realities of the nodal network organizations that they belong to.

As most of those I interviewed ranged in age from their mid-twenties to just over forty –

the entirety of their work lives could be seen as being shaped by the rise of the network

society, and have been spent within the structures of some variation or another of a

network organization. They have become used to constant fluctuations in the high-tech

economy, where the threat of job-insecurity was compounded by the dot-com crash.

Even the scope of their jobs has been shaped by the network society, where their elevated

educational training and work mobility habits resemble those employed in the specialized

service sector (producer services), rather than that of the assembly line workers.

Unfortunately, high-tech professionals are often faced with a re-engineering of the

business structures of the companies they work for, and as Sennett contends the most

salient fact attached to this type of corporate reengineering, is a down-sizing of jobs

(1998, 49).

8.2 Innovation and technology

As discussed before, the industry of high-tech is based on values of product innovation and the power of technology to shape our world – much akin to the values of the network society. These values can reach deep into the psyche of the high-tech professional as a source of inspiration and motivation to continue the important technological developments that are part of their work.

These values are also reflected in the corporate mantras of the companies that the professionals that I interviewed work for. Examples of an internalization of the values of innovation and technology were often integrated into the corporate 'legends' of these organizations. There were many stories of 'founding' technologies or innovative solutions that were woven into the folklore of the successes of the companies, as a means to inspire employees to push towards new technological heights.

For many of those interviewed, these values of innovation and technology meant that their work was/is a creative process, likened as Barrett suggests – to an art (2004, 779). In this sense, the work of the high-tech professional fits the model discussed by Castells and Sennett of 'flexible specialization', where the professionals interviewed were continually innovating and adapting to new information and market conditions. However, this process brings up one of the difficulties with working in the informational age where importance is placed on these concepts of innovation, technological growth

and creativity, in that it becomes difficult to culturally mitigate the constant changes

involved with the work process.

In order to keep up with the constant flows of information required for doing business in

the network economy, companies have had to incorporate and culturally shape new

approaches to time – and in high-tech this is mainly seen in the emergence of 'flex-time'.

Sennett contends that with the use of flex-time the working day is now a mosaic of

people working on different, more individualized schedules, and is often used by

companies as a reward (1998,57). One person that I met at a party of high-tech

professionals mentioned a profound fondness for being able to schedule work around his

life. But, most of those interviewed, viewed flex-time in less friendly terms – as posing

the danger of work impeding on other domains of life.

In discussing the organizational cultures of the companies of the professionals that I

interviewed, many of them alluded to having a sense of detachment from the

organization. Those who seemed to have the strongest sense of cultural continuity with

the companies that they worked for, described organizational structures that were more

bureaucratic in nature; while those experiencing less of a connection with the companies

that they worked for described their companies as being more decentralized, nodal

structures. However, it might be that in the latter case, that identity is more towards

one's profession rather than towards one's company. This seems to be the case in other

studies of professionals in work organizations – for example lawyers, doctors, nurses, and university professors.

However, as mentioned before, at the root of any corporate culture is the need to motivate employees to work harder as a result of assimilating the values of the company. In the past, many workers were able to forge a strong, loyal, connection with the companies that employed them. These connections were due to a mixture of cultural constructs and structures namely: clearly defined career paths for their employees; job security through seniority; and a system of reciprocal trust and commitment (Sennett). As Sennett proposes, the rise of the network organization also brought with it shame about dependence on any one or group – eroding mutual trust and commitment, and as a consequence – personal character (Sennett:1998, 141). Trust is an important value for any organization, and has seemingly been lost in the new network society and network organization (ibid). The new methods of flexible production, downsizing and outsourcing leave employees with little chance to develop these types of trust structures among them. In older structures of bureaucracy or unionized jobs, these conditions of trust and dependency were fostered through strong corporate cultures that could instill in their employees a sense of attachment, trust and loyalty. But among the high-tech employees I interviewed there is little loyalty and commitment towards their employers, as these traits are not reciprocated by the companies themselves.

8.3 Organizational environments within high-tech

The organizational environment of the companies in high-tech is yet another factor

influencing the levels of contentment with work among those individuals I interviewed.

With this, the most common (and really only) organizational environment that those I

interviewed described, was in one form or another, that of an open-concept office.

As Carrier and Miller reiterate, over the past two decades we have seen the rise of the

market-driven, flexible firm accompanied by a demand for market-driven, flexible

workers (1998, 1-2), and the organizational structures and environments described by

those interviewed would seem to fit this trend. This rise in flexible work has come to

mean flexible workers that can be hired and fired easily, and a shift of production off-

shore in search of lower wages (ibid). More interestingly, Carrier and Miller have noted

a trend in the west towards a *virtualism* of the economy stipulating that there is a removal

of economic activities from the social and other relationships in which they had

previously occurred, and a subsequent carrying out of these activities in abstraction from

social relations (Carrier & Miller: 1998, 2).

With a reorganization of work from hierarchical bureaucracies into networked

organizations, one could theorize that the old adages of observation, supervision and

control, would no longer apply in this new, 'networked' milieu. In the case of my

interviews, the professionals I talked with spoke of the free exchange of ideas in an open-

concept office, but then proceeded to relate methods for coping with noise, and distraction that shut them off from the rest of the work environment. Instead, with the use of the open-concept office prevalent in the work environments of high-tech, these same concerns with observation, supervision and control can also be seen as a significant element shaping the structure of the working environments of high-tech. These leanings towards surveillance and control, and shutting one's self off from the environment in order to work, were also echoed by Freeman, and the concept of the individualization of work postulated by Castells. Freeman noted the atomized, individual nature of computer work, in which key players are physically divided from each other at cellular stations (2000, 199). With this, she argued that the open-concept office also achieves a double layer of surveillance – the level of monitoring using the computer, and another layer of human supervision (ibid).

In a similar sense, the open-concept office discourages informal social connections in the workplace because all interactions can be observed. Many of those people I interviewed echoed Sennett's call for community, as a means to remedying the current disaggregating realities of work in the open-concept office – where, another of the perils of the open-concept office is that it robs the professional of a sense of individuality, a sense of importance, within the greater scheme of the organizational whole. Similar to this, Sennett proposes that there is a need for employees to feel useful, and feeling useful means contributing something that matters to other people – and receiving public acknowledgement of the value of their work (ibid, 190). In this sense, the high-tech

professionals that I interviewed (such as Richard) that had participated in corporate

'bonding' events felt a closer attachment to the companies they worked for, especially

when this was compounded by an expectation of long-term employment within a more

bureaucratized rather than networked organizational structure (as mentioned in the

previous section of the conclusion). Some interviewed also mentioned that when group

dynamics were strong, co-workers would not hesitate to eavesdrop and chime in with

suggestions or solutions if they had them. However, these constant interruptions leads

one to question whether or not this practice of an open-concept office stimulates

creativity and the free exchange of information, or hinders it, as people are constantly

being interrupted.

As the realities of the open-concept office seem much more in keeping with an

atmosphere of surveillance than openness, this then leads one to question whether or not

the open-concept office is necessarily the most productive environment for coding?

What seems to 'fit' however is Castells' argument that the – the work processes of these

'network' companies are increasingly individualized, and the new division of labor is

based on the attributes and capacities of each worker, rather than on the organization of

the task (Castells: 1996, 471). With individualization now built into the system of doing

work in high-tech, is there really that much need for the control and surveillance of high-

tech professionals by their managers in order to get high-tech products out to market or

would a full leap towards a more traditional closed-office structure be more beneficial to

the organizational cultures and employee productivity?

Among the other problems related to negotiating the open-concept office brought up by those I interviewed were issues of privacy and personal space. For those interviewed that were able to carve out a little personal niches for themselves within the work environment through the use of music or photos or in one case even a cappuccino machine – there seemed to be more of a sense of personal commitment and loyalty to the organization, a sense of belonging. Too much space however, can also become a problem as seen with Natasha's example of her abandonment in a no-man's-land when her company had gone through a major restructuring and down-sizing of staff, and she was left practically alone on her floor of the building. These examples would seem to fit with Sennett's argument that what is missing from the network organization is a sense of community evoking the social and personal dimensions of a place (1998, 137). With this, one of the unintended consequences of capitalism in network society, is that it has strengthened the value of place, where community is used as a defense against confusion and dislocation (ibid, 138). While the cubicles and desks of the open-concept office maybe 'open', the personal constructs that people must erect in order to get their work done do not lend themselves to this sense of 'community'.

8.4   Identity and Career

When looking at the constructions of identity and career of those that I interviewed, two main distinctions appeared. The professionals interviewed had developed constructions

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of their work roles and obligations, as separate from how they described themselves. Their descriptions of self, were instead based more on what they would do and with whom they would associate in their 'free-time'.

As mentioned in the section on identity and career, the high-tech professionals interviewed identified their work tasks with three primary roles, that of a teacher, manager or coder, and described their personalities as being permutations of either people-people or geeks. These identifications help the high-tech professional to situate where they belong within the new network organization – they give them a sense of work-self and clarity of task, even when faced with the increasing individualization of work and fragmentation of the nodal networks that exist within high-tech organizations. In seeing themselves as teachers, managers or coders, they are better equipped to join other 'nodal' groups or networks of the same role definition, or those requiring their particular role (not unlike Sassen's producer services). These constructions of work identities, is yet another method that allows them to adapt to the quickly changing organizational networks in which they must work.

Many of the professionals I interviewed expressed concern about the routes that their careers would take until they (hopefully) retired. As discussed earlier, there is an understanding that the high-tech workforce as members of the network economy, are forced to constantly push forward – whether it be pushing the technology itself, or themselves to cope with the often-changing technologies and work environments. As a

consequence, it would seem that the high-tech professional can never be professionally at rest. As explored before, Sennett would stipulate that in order to prosper in the unstable, fragmentary social conditions of the network society, individuals must overcome three challenges; time, talent, and surrender (Sennett:2006, 3-5). He further defines time as how an individual manages short-term relationships and him or herself while migrating from task to task, job to job, place to place (ibid). Talent is a construction of how the professional develops new skills, how to mine potential abilities as realities shift – where the shelf life of many skills is short, and a system of meritocracy in place in network organizations celebrates potential ability rather than past achievement (ibid). Lastly, surrender is how an individual lets go of the past, where no one owns their place in the organization despite positive past performances (ibid).

This returns us once again to issues of loyalty, commitment and community. As explored by Sennett and McKay, worker loyalty is still important to the success of any firm. "Loyalty is particularly important because it builds mutual trust and drives workers to participate in problem-solving. Loyalty is most influenced by positive incentives and promotional opportunities." (McKay, 2004: 378-379). In establishing the loyalty of its employees, companies have a greater chance of securing their employees' effort or the willingness to work hard, as well as employee attachment or their intent to stay with the company (ibid). However, as mentioned often, loyalty is a sentiment that is hard to construct in a network organization, where as people spend shorter and shorter amounts of time in a particular work environments due to flexible production, the bonds of trust

are not allowed to blossom into a sense of community in the workplace (Sennett:1998, 143). When there is no sense of need for the employee from the corporation, there radiates a sense of indifference and disconnectedness – where people are disposable, because the system itself is less starkly laid out for them, and where networks and teams weaken character as the 'other' is missing from the equation (Sennett:1998, 146). With this, the problem of character is that there is history, but no shared narrative of difficulty and so no shared sense of fate among the employees of the network organization (Sennett:1998, 147).

The professionals that I interviewed developed two very interesting coping mechanisms in order to negotiate the network industry of high-tech – the first of which is 'job-hopping'. Job-hopping was/is used by the professionals I interviewed as a means of over coming a number of obstacles namely, down-sizing, skill retraining, career and salary advancement, and also as a means to have more control and a sense of agency with respect to their career paths. As pyramidal hierarchies are replaced by looser networks in nodal constructions of production and organizations, people who often change jobs can experience what is known as 'ambiguously lateral moves' (Sennett, 1998, 85). These are moves in which a person in fact moves sideways even while believing that he or she is moving up in the loose network (ibid). In the end however, any occupational risks of this sort, are based on whether or not the individual will earn more money (ibid).

Another important component to job-hopping are the interpersonal networks that are involved with finding that 'next job'. Relationships with co-workers become increasingly important, as people never know when they might be laid-off or find themselves clamoring to work on something new. In this sense, it is prudent to have a large network of friends and sociable co-workers within the industry that you can call on when the search for the newest job begins. These networks can be local or even international in scope – but, managing these networks of people is integral to the development of the high-tech professional's career, as members of the network society.

Among the high-tech professionals that I interviewed the next technique used to cope with insecure work conditions, was the structuring of the concepts of identity around their 'free-time' activities. Sennett contends that fragmentation of the big institutions have left many people's personal lives unsettled as family life is disjointed by the demands of work, where people feel as though they must keep moving rather than settling (Sennett: 2006, 2). As English-Lueck realized in her study of high-tech professionals in Silicon-Valley, a characteristic of the network society is an increasing colonization of life by work, where life is managed and skills cultivated to fit the needs of a changing daily world (2002, 67). Furthermore, the logic of technical work involves setting goals and objectives in order to produce a concrete deliverable and high-tech workers are sometimes unable to turn-off the emotional and intellectual demands of work (ibid). In highly scheduling their free-time, the professionals that I interviewed were able to

construct fixed boundaries between work and life – lines that are being blurred at a

quickening pace.

8.5   Women in high-tech

When looking at women in high-tech, one blaring truth presents itself: in many of the

professions linked to the sciences including engineering and computer science, women's

numbers are far fewer than their male counterparts. As Kelty points out in his study of

the Internet and the professionals that shape it, the only thing that seemed invariable

about the professionals studied, was that his informants were almost one-hundred percent

male (2005, 191). With this, the Women of Silicon Valley 2001 report outlined three

predictors for the retention of female employees in high-tech positions, namely:

satisfaction with development opportunities; the ability to achieve work/life balance; and

lastly, fit with the company culture. Furthermore, "...work practices, patterns, and norms

prevalent in [high-tech] companies that seem neutral may subtly and systematically

disadvantage and discourage women..."(WOSV 2001: 30). However, in my experiences

talking with women in high-tech jobs, there would not seem to be a difference in the use

of the techniques of job-hopping and free-time outlined before – where both the men and

the women interviewed used these methods to cope with the insecurities of working in

the network economy. In this sense, whether male or female, we are all just nodes in the

network...

8.6   Still nodes in the network...

As products of the network society, the high-tech professionals discussed throughout this thesis find themselves nodes in many different, interrelated, organizational and personal networks. With this, as mentioned before, the danger lies in that any slip in anyone of these networks can spell disaster for the high-tech professional. As has been discussed throughout the entirety of this thesis, the high-tech professionals interviewed have devised many different techniques in order to negotiate the weak corporate, industrial, and professional cultures that are related to high-tech work.

The most impressive and effective of these techniques however, was how those interviewed were able to erect boundaries between work-life and free-time through making sure that their constructions of self fall outside the grasp of influence of the network society and organizations. As Sennett argues, all of the emotional conditions of the workplace – uncertainties attached to flexible production, the absence of deeply rooted trust and commitment, the superficiality of teamwork, and failing to 'make it', make people yearn for some other scene of attachment and depth (1998,138). It would seem that the fourteen 'nodes' interviewed for this thesis have been able to find their places of attachment and depth within themselves and the 'trusted' networks of people that matter most to them.

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10.0 GLOSSARY OF TERMS

Coders	A sub-set of the high-tech professional occupational culture. They write the computer code that is the software and that makes the hardware function. These professionals are on the frontlines of software and hardware development. Also known as programmers.
Code	Defined by Encyclopedia Britannica as a system of symbols and rules used for expressing information according to an unvarying rule for replacing a piece of information from one system, such as a letter, word, or phrase, with an arbitrarily selected equivalent in another system. Computer code fits this definition in that computer programmers uses source code to communicate with the binary code systems that run the computer.
Computer languages	Also known as programming languages. They are the different languages in which computer programmers write instructions for a computer to execute.(Encyclopaedia Britannica)
Cubicle farms	One type of high-tech work environment characterized by a large open area with row upon row of cubicle work spaces.
Flex-time	The use of scheduling reforms within industry that allow workers to work hours outside of the usual 9:00 to 17:00 business standard.
Flow	A state of mind in which the high-tech professional is able to code almost effortlessly for hours on end without realizing the passage of time.
Geeks	Among those in high-tech, the term 'geek' has come to describe a grander-than-most-aptitude for interaction with the computer – a genius of sorts. Geeks tend to be great computer linguists, but most have difficulty with interpersonal communication.
Hardware	Computer machinery and equipment, including memory, cabling, power supply, peripheral devices, and circuit boards.(Encyclopaedia Britannica)
High-tech	The industry surrounding the development of computer software and computer hardware technologies

Information technology	Discipline that deals with the processes of storing and transferring information using computers and computer software.(Encyclopaedia Britannica)
Intellectual Property	Property that derives from the work of an individual's mind or intellect.(Encyclopaedia Britannica) In the high-tech field, these 'intangibles' are legally protected through copyrights, patents.
Managers	Often begin careers as coders, where after a few years of experience and success under their belts, they are entrusted with their own teams and projects to manage.
People-people	Those high-tech professionals that have stronger interpersonal, than computer linguistic skills. While still incredibly technologically able, people-people seem more able at bridging the laymen-technological gap than do their geek counterparts.
Programmers	See coders.
Software	Software is the entire set of programs, procedures, and routines associated with the operation of a computer system, including the operating system.(Encyclopaedia Britannica)
Teachers	Technology front-runners that teach the coders and mangers how to work with a new technology, or a new computer language. 'Teachers' facilitate the assimilation and application of the new technologies into projects. Often find themselves in the role of bridging the technological gap between laymen and high-tech.
Worker drone	Refers to the sentiment shared among some high-tech professionals that they are not individuals within their organizational work structures. More often associated with computer software/hardware work that is repetitive and requires less creativity than other programming tasks.
Zoning out	Techniques used by high-tech professionals to concentrate in the work environment. The most common form is by limiting peripheral hearing by using headphones and music.

11.0   APPENDIX 1 –
Sample Of Basic Questions Used In Interviewing

(A)   Name, Date, time, place

(B)   Basic background information:
a. Where were you born?
b. Where did you grow up?
c. Where did you go to school?
d. What is your educational background?
e. What lead you towards becoming a high-tech professional?
f. Influences towards this type of work – why a career in high-tech?

(C)   Career development:
a. What do you do at work – what is the nature of your work?
b. History since graduation?
     i. What was your first, second, third.... Job?
     ii. Why did you pick those jobs (was a it a product of downsizing, needing a change, wanted to change branches in the industry...)?

(D)   Profile of companies they have worked for:
a. What were/are the companies like?
b. What were/are the layouts like?
     i. What about privacy, individuality?
c. What was/is their workspace like?
d. What was/is expected of the employees from the companies?
e. What was/is expected of the companies from the employees?
f. What are your co-workers like?
g. How would you describe the cultures of the different companies?
     i. Were there any founding stories?
     ii. Successes or failures?
     iii. Special lingo?
     iv. How does the computer, innovation and technology fit in?
h. How did you feel working at each company?
i. Which company did you like working at the most and why?
j. What is a basic day at work like for you?
k. Do you feel like you 'fit' in at work? Why or why not?

(E)   How would you describe yourself?
a. Would you say that you are like your co-workers or different from them? How?
b. Is there a typical 'personality' type to high-tech professionals?
c. Do you interact with your co-workers outside of work?

    d. Does work affect your personal life – how?

    e. What is your life like outside of work?

    f. How important are your work relationships?

    g. Do you have a large network of friends within the high-tech industry?

    h. What are your friends like – what do they do?

(F)   **What is high-tech?**

    a. How would you describe the culture of high-tech?

    b. Is there a culture of high-tech professionals?

    c. Are there any values shared by the companies and the professionals working in high-tech that everyone believes in?

(G)   **Are there any topics that I haven't asked you about that you think is important or interesting?**

12.0 APPENDIX 2 –
Short Summaries of People Interviewed

Assam

Assam's work and life history were an interesting perspective on how we are sometimes conditioned towards certain careers due to our upbringing. In his case, his father is also an engineer. This compounded by his Pakistani upbringing, led to his choice to become a computer engineer.

When Cegep came to an end, Assam's natural choice was engineering. As a child his father had brought home a number of computers for his sons to play with in their spare time. They were not discouraged from opening up the sensitive machinery in order to explore what made them 'tic'. While Assam had been accepted into a pure math degree, it would not give him a professional designation, and therefore engineering became his chosen path. Having a professional designation was of the utmost importance to his parents who had immigrated to Canada when Assam was a baby. They saw it as a true mark of success for their first born.

Assam's first experience in the workplace was while still in school – he would work as a summer intern at his father's company which developed aeronautical simulation software. His first full-time position after graduation was also with the same company – where he worked in a group that was a 'think-tank' for the rest of the company, a division that's tasks surrounded coming up and developing new ideas that the company could build on and market. He enjoyed the innovation and creativeness

of his position, but wanted to explore other fields that would put him more directly in contact with the end-user.

Leaving his father's company was one of the hardest decisions Assam had to make, but he had found an exciting position that paid substantially more through a friend. Beginning at the new company was a whirlwind experience – his computer and desk were not ready for him until a few days after he started his new job, and it also took a few days before his supervisor came to show him around the company. The next two years were spent travelling around North America, installing and customizing systems to client's specifications. He was given a company credit card and was never asked to explain his expense reports – he could go out to a club and buy everyone drinks, or take himself out for dinner at an expensive restaurant with no questions asked. He was expected to live the high-life by his employers, in exchange for being on-call 24/7. On one occasion, he was in Toronto visiting family for the week-end, when his boss called him to go to New York to visit a client the next morning – they flew him out of Toronto and told him to buy clothing on the company card for the week when he arrived there.

Assam began to feel himself and his values change, and didn't like the person he was becoming – while the salary was unbelievable, he needed more stability in his life. He asked around, and another friend knew of a position opening up in his company. Yet again, Assam changed jobs. The new environment is much more like a family – there is a weekly Friday afternoon party, where the company supplied the drinks, and breakfasts were also supplied. Joint information sessions were given every quarter by

the companies co-presidents – one president is a technically minded, where the other

president is from a business/sales background – which lead to all of the employees

feeling like they are part of the same team, no matter which field they work in. the

interview process was also an indicator of a different environment, in that he was

asked very few technical questions, but met with 3 different people to ensure fit with

the work team. However, Assam was downsized at this newest company after only

one year due to a merger with a larger conglomerate. At last contact, he was a new

company, working with financial software as a project manager.

Josephine

While Josephine's educational background is not directly linked to High-Tech, her

work has led her to have a strong knowledge of programming languages and

computer logic. She in fact manages a team of 'techies', for a major telephone

company's website, and is the liaison between this group of developers and the

marketing department for the company's 'web stuff'.

The structure for most of her company is that of a centralized hierarchy – the product

of 125 years of being in business. When Josephine began at the company, the jobs

and levels of management an employee could expect to move through throughout

their life-long employment with the company, was very structured. Throughout the

last 10 years however, the company has made the shift from monopoly to a

competitive market place – leading to a more informal culture shared among its

employees. Whereas before, everyone was referred to as Mr. So-and-so, now

employees refer to all other employees by their first name regardless of their standing

in the corporate structure. This attempt at de-centralization, is most apparent in the departments which touch on high-tech; where the company has tried to approximate the 'open-concept' used by most high-tech firms.

Josephine's job, is mostly to relate the needs of the consumer to her development group, so that they can be incorporated in the company's web-site. One of the things she finds most interesting about the tech-side of her job, is that there is always a tangible result at the end of the group's projects. Whether it be a new feature, or a new look to the website, the exciting part of the job is that her ideas and the ideas of her group are able to go from ideas to reality.

As far as managing her 'techies', Josephine has found that the best motivator, is not bonuses, or stock options, but the challenge of trying to build something that has never been done before. She admires her group's need to innovate and create, and would use that need as a key descriptor for the culture of high-tech.

Josephine's rise up the corporate ladder on the management side of the company was one that was very structured – but she does not see these same types of promotion irregardless of sex occurring with the de-centralized structure of the high-tech branch of the company. With that unstructured format, she feels that women can often fall through the cracks when it comes time for promotion. Interestingly, she enjoys a very full social life filled with sports, arts, and family – as a reward (he words) for all of her hard work.

Matteo

While Matteo's work experience hasn't had much to do with his engineering degree or hi-tech, it does speak volumes about his personality.

Matteo is a people-person. After completing his degree in electrical engineering, he went on a whirl-wind trip around Europe – he wanted to 'live' after having been confined to his studies for so long. Unfortunately, upon return from his trip, the dot-com bubble had burst and his guaranteed position at a hi-tech firm had been down-sized. Now looking for work, Matteo easily found a position in technical support – answering people's computer-related questions over the phone. While it wasn't his dream job, with little room for movement up the corporate ladder; Matteo excelled at what he did. He soon tired of the strange work hours and shift work however, and found himself searching the 'Want Ads' once more.

Easily passing the interview for a banking related information systems company, Matteo left his tech support position for the new 9 to 5 job. Once again his people skills were put to good use, whereby he became the 'tech' guy on a sales team that offered automatic teller software and hardware to merchants. Despite the 'techiness' of his title, Matteo still did not have direct influence or access over any of the products source code or hardware – he had been hired to explain how the technology worked to the end consumer, rather than being part of the team that made the technology work. Adding to Matteo quickly tiring of his position, was the fact that many of his co-workers did not have a university or CEGEP degree – he felt that his

talents were being underused, and ultimately left his job to search for more of a

software or hardware design position.

A few months after leaving the banking IS company, Matteo is finding it difficult to

find a job, having no software or hardware work experience. What was most

interesting about this interview however, is the fact that Matteo is actively searching

for a job that will allow him to create, to innovate; that he believes that this type of

position is where he would belong, where he would be happy. He openly talked about

how engineers are trained to think outside the box, to push the way things are done to

come up with better ways of doing things.

Michael

As a child in Argentina, Michael remembered always taking apart electronic

equipment and putting it back together again with the encouragement of his parents.

The high school he attended also encouraged this type of discovery approach, as

students would follow regular classes in the morning and then proceed to 'hands-on'

courses based on mechanics or electronics in the afternoon. It was only natural then,

that Michael go into electrical engineering. However, the program was quite lengthy

(6 years), and after working part-time jobs while studying, Michael was offered a job

in the graphics department of Argentina's largest TV station, and left school to work

full-time.

The excitement and pace of the TV station was unlike any job that Michael had

worked at before. He was part of a tight-knit group of programmers who shared one

long table in a small room – coding strange hours in order to make the stations

graphics cutting-edge. Michael enjoyed the openness of his group, he enjoyed that all

members sat together rather than at separate desks or in cubicles. After a few years

however, he tired of the long hours for little pay, and left his position.

It was at this point, that a friend in Canada suggested he visit him. Michael booked

the plane ticket, and headed North in search of a new adventure. At a welcome party,

he had been talking about how he had left his job – and someone asked immediately if

he had a CV. Within a week, he had interviewed and got a position with a Video

graphics firm in Montreal, and was on his way back to Argentina to begin the VISA

and immigration process.

Starting at his new job was an interesting experience. On the day Michael started,

most of his soon-to-be-colleagues were away on a major contract, and after the guided

tour by the HR director, he was left on his own to read through the company

information given him, as his supervisor was also away. He really enjoyed the new

work environment – it was an open-concept office, and there were always interesting

things and conversations going on as a consequence. Another aspect that Michael

loved/hated was the travel involved with his job. While American clients were

demanding, expecting Michael and his co-workers to work 14-18 hour days in order

to fix 'bugs'; his clients in Europe were more respectful of his quality of life, and

allowed him time-off to recuperate and explore the new cities he was working in.

After 4 years of constant travel however, Michael felt he needed a break and quit his

job to finally complete a university degree.

Dropping out of his electrical engineering degree at the University of Buenos Ares to work full-time is something that Michael regretted and he has since returned to University to pursue computer engineering.

On more general questions and discussions, Michael talked about the fact that he stayed at his last company for 4 years in an industry that is known for its 'job hopping'. He stated that he really enjoyed the work, and felt valued by the company – they had arranged for all of his immigration papers initially, even though it was not included in his contract – and he felt close with his co-workers. When asked about women in high-tech, he believes that it is a product of the history of the computer industry – where it was founded by men. He sees more and more women entering the high-tech field, and enjoys the fact that the proportion of his classes in engineering are almost 50-50.

Monique

It had taken a little less than two weeks for me to be sitting in face-to-face with Monique from the point one of my friends had suggested I interview her. Monique had spent the last three years since graduation as an ex-pat working throughout Europe and North America. Even when she had been working 'at home' it had been more than 500km from where she was raised and her parents still resided.

On a bright June morning, I found myself sitting with Monique in her parents' kitchen while she was having her hair colored by the family hairdresser – a friend of her

mother's since childhood. I was catching Monique at a crossroads in her life – soon

she would be flying to France, beginning a new job as a salesperson for a medical

technology firm that developed among other products, robotic prostheses for

amputees. She had spent the last two weeks staying 'at home' with her parents since

leaving her job in Toronto for this new opportunity abroad.

While she can't pinpoint the exact age a computer first appeared in their home;

Monique can remember using the computer for schoolwork from an early age. She

recalls all of her friends being thoroughly impressed as she was able to use DOS

commands and was allowed to use 'her parents' computer. None of this seemed out

of the ordinary for her, as she was never told she wasn't allowed to tinker on the

computer.

Aspects of equality were again reinforced as Monique began high school. Although

her parents had sent her to an all girls catholic private school; the headmistress of the

school was a very progressive woman who would challenge the girls to explore new

fields historically dominated by men. As Monique pointed out, this may not seem

unusual for a headmistress to stress for her students, but in this case, the headmistress

was in her early 80s and also a nun! This particular high school was one of the first in

the Montreal area to integrate the use of laptop computers in the classroom for all

subjects on a daily basis.

Monique was inspired by the headmistress' message that women could accomplish

wonderful things within the scientific community, and knew that her main career

interests lay within the sciences. When entering CEGEP, she thought her future

would lie somewhere within the medical field – she never imagined herself as a

computer engineer until it happened. In CEGEP, Monique found many others around

her with stronger academic credentials to get into Med School, and began to re-

evaluate her career choices. After writing personality, aptitude and interest tests – a

career counselor suggested three career possibilities where Monique would excel – as

a kindergarten teacher, a financial manager or an engineer. She chose computer

engineering.

Summers throughout university were spent working for a small software company in

the Montreal area. While the work was challenging, it was the all male environment

that took Monique the longest to get used to. Although at university the split in

engineering was still not 50-50, there were still many more women to joke around

with and gossip to than the 15 to 1 split of her new office environment (she being the

1). The work environment was a fun one, where the employees would often play

soccer together in the hallways, or go for a 'sports break' outside on the front lawn.

While all the employees had their own offices (a rare occurrence in High-tech),

Monique as the intern unfortunately found herself in the hallway, but didn't mind as it

provided a more social atmosphere for her, where she could chit-chat with passers-by.

She so impressed her boss, that he hired her for all of her summers throughout

university.

This was drastically different from her experience at a 'big' company. While waiting

for her work permits for Europe to come through, Monique had spent the last nine

months living in Toronto working for large multinational company. While at the

small firm as an intern there had never been a lack of work to be done – working for

this large multi-national was a completely different issue. She found the levels of

bureaucracy difficult to cope with in order to push her project forward, and would

often find herself asking for additional work while playing the 'waiting game' for

approval for the project she had been hired to do.

The socialization process at this large conglomerate was very structured, where

neophytes would find themselves in a week long orientation session, meant not only

to introduce them to the ins and outs of working and getting the job done in the large

firm; but to the history of the evolution of the company, including their mergers and

acquisitions. She remembers having been flown into Toronto, sharing meals and

lodging with the new recruits. While this process did acquaint her with what was

expected of her from the company, it did not help her in weeding through the levels of

bureaucracy involved with her job.

Monique had spent her years since graduating from the 'Polytechnique' working in

Switzerland and Toronto (discussed above). In her last year of University, Monique

had spent a term abroad in Switzerland and upon graduating she decided that instead

of just traveling to Europe, why not work there instead? Through a bit of research

and networking with friends and acquaintances she had made in Switzerland; she was

able to find a position as an intern at a bio-medical research institute. This

environment was again very decentralized, where her new supervisor took a walk

with her around the different floors of the institute to introduce her to the other 40

employees. As the environment was geared towards research, the atmosphere was far

less social than had been her experiences at both her summer job and her time at the

large multi-national. While her work was of great interest to her, the relaxed

environment and lax deadlines of the research institute, left her very unmotivated.

She was rarely able to get a clear answer to when parts of her project were due, and

found her co-workers just as nonchalant about their deadlines. There were also fewer

women with whom she could converse during her days – the institutes' gender

breakdown was about 20% female and 80% male.

Although she did not have the amount of guidance she would have liked to have from

her supervisor who was "...more of a geek...", Monique's project was a success. She

"...was asked to speak at a few conferences and trade shows to present the results of

the new project...", and because of her presence and warm personality, was offered a

job with a sister company that supported the institute she was working at. This new

position was again in Switzerland, but would be of completely different from

anything she had done before. This new position, was in sales.

Intriguingly, Monique's choice to work in sales seems to be a choice made because

she "...needs a more social aspect to her work [and] hates being stuck in her office all

day long programming." She finds programming to be "...a lonely process."

Although she enjoys the inventive and creative aspects involved with programming,

"It takes a long time to become an systems architect with a team – working on

designing the whole system with a team to manage." Monique is hoping that sales

will offer her a chance to be challenged, but at the same time will give her the social

interaction she is yearning for.

Natasha

Natasha was born in Montreal, but both of her parents had immigrated from Hong

Kong. She attended French school from Kindergarten up to Cegep, when she decided

to switch to an English Cegep. Although she had always seen herself as an architect

up until decided which program to go into in University, she was doubtful of her

'creative talents' and was worried that she would not get accepted in Architecture. At

that time, she started thinking about other options and based her career decision on the

physics classes at Cegep – her favourite and best class was Electricity and Magnetism

so she decided to apply into Engineering.

Because most of the engineering courses were 'dry' and difficult, Natasha knew that

she was not passionate for engineering and thought throughout her degree that she

would do a second degree after engineering in architecture. However, after 4 years in

Engineering, she was just happy to graduate and forgot about pursuing the

architecture degree. Also, when she graduated in 1999 the High-tech industry was

booming – with a bounty of job opportunities for all those who had just graduated.

At the time she was interviewed, Natasha was still working for the same company she

had started with after graduation – one of Canada's largest telecommunications firms.

Her title is a "Systems engineer", working very closely with the designers, customers

as well as the business managers for the company's products. As a systems

Engineer, Natasha's job is to help identify the customer needs/requirements to the development team to ensure their concerns are addressed. Her group develops presentations/documentation, demonstrations of early prototypes to customers for feedback, and testing in order to introduce the customers to the product or the new features offered. Once, the product is in the field, her group also provides some level of support and develop special procedures that may be required for particular customers.

Before the tech stock crash, work was fun for Natasha and there were many opportunities to get training (technical and non-technical, ex: languages, Leadership skills, etc.). The company was focused on developing new technologies for the future. Given the demands were constantly expanding, customers networks were growing and they kept ordering new equipment to grow their networks. The company was able to offer very customized services to address these customer needs. Since the 'crash' the company has gone through layoff after layoff – the expectation from the company is now for their employees to continue to offer 'quality and best in class products', even with fewer and fewer resources. Since there was no 'job security', many employees were simply happy to still have a job, so they would work countless hours without getting paid for the overtime, or getting the banked time. The conditions were very difficult and stress levels were increasing, both from a personal level (as she didn't know when the next round of layoffs would come) and from a professional level (they needed to keep the customers that they already had, but still try to get new contracts from customers who were now spending much less than before).

With things now more stable in the market, the company that Natasha works for now

has many new competitors (especially from countries such as China, India, etc.) who

are emerging with the same technologies (or more advanced technologies), but at a

much cheaper price. Since customers are not willing to spend as 'frivolously' as

before, they are looking for a competitive price when making their vendor selection.

This puts added pressure onto the employees, to meet such demands.

Most of Natasha's co-workers are very talented, hard-working and loyal and have put

in all the 'extras' to keep the company going through the tough times. However,

Natasha felt that the company she worked for was not able to respond to their

employees needs. The employees are still working hard, even though there had been

no recognition, no bonus or salary increases in many years after the crash, and limited

to no career development. The motivation and the morale of employees had been

extremely low.

When she started working for the company the social aspect to the company was fun

and the average age of the full-time employees was quite young. They all became

friends very easily and would hang out after work or participate in the company's

many 'intra-mural' activities, such as beach volleyball, soccer, softball, etc.to promote

such camaraderie. She has made many good friends through her work, with which she

spends time with even outside of work. However, work is very demanding and in

order to meet all her deadlines, she has to put in numerous extra hours, without any

compensation or recognition. She would often work late into the evening/night and

had lost many weekends over work – feeling like she's come close to burning-out 2-3 times during the last few years.

Richard

Richard was of an immigrant background, having moved to Canada when he was three years old. His father also had an engineering background, and his two older brothers both had computer science degrees. The career paths of his father and brothers greatly influenced Richard in choosing to become a computer engineer. He remarked that there was a little more parental pressure in his family than he saw with his friends, to find a career with a professional designation. This push, influenced him in his decision to become an engineer. Also similar to other respondents, Richard was exposed to a computer at a very early age, and was encouraged to 'play' with it as he wished. He remembered fondly his first video games, and then the wonderment for how they were created.

While in university, Richard was part of a co-op program, which afforded him real work experience while still pursuing his studies. The first of his co-op jobs was as a researcher in Ottawa. The work was interesting, touching on subjects Richard had never encountered throughout his studies. As a software tester, it was his job to poke holes in the programs he was testing, trying to improve its quality, through finding errors. The decentralization and free-ness of the work environment in research, were also appealing to someone who was used to student life. After a summer semester away, Richard returned to school eager to benefit from the experience he had gained over the summer.

Richard's second work-term while in school was for a major mobile

telecommunications firm. The structure of this new environment was highly

centralized, whereby everyone at the company had an official title assigned to them.

Richard found himself sharing an enclosed office with three other programmers. The

office was one out many working on the same project. While the enclosed space

provided his small group with relatively more privacy than an open-concept office

would, it did not provide for the free exchange of information and ideas often

associated with High-tech. Interaction and even finding other group members in such

a large individually, enclosed office space was sometimes very difficult – almost as if

playing hide-and-seek.

Richard's last work semester which continued throughout the school year and is

where he is still working 4 years after graduation, was for another large high-tech firm

specializing in speech recognition and computer generated speech, was structured in

much more of a decentralized, cubicle style office structure. He enjoys his job, and

hopes to be promoted to a project manager position.

One other interesting aspect of Richard's interview was his description of himself. He

does not see himself as a true computer 'geek', who are those stereotypes usually

associated with those working in High-tech. His description of himself fits quite well

with the pattern of people-people and geek personality types that have come up in

other interviews. Richard's hope for becoming a project manager, and dealing with

more of the sales/marketing/customer relations end of high-tech fits the people-people

profile which seems to be emerging.

Sam

Sam's interest in high-tech began much later than most of the other professionals

interviewed. While he had been exposed to video games such as ATARI as a child,

he really had no interests as to how the 'insides' of a computer work. His interests in

school growing up were always more linked to the 'social' end of the science

spectrum. He did not find he had an aptitude for the sciences such as chemistry and

biology, but was always quite strong in math. Naturally, when entering CEGEP Sam

did not gravitate towards the sciences as most of my other respondents did, but

decided that his interests would be best served by a social sciences degree.

Upon completion of his DEC, Sam found himself at a loss for what his next 'life

move' would be. He did not feel that he would be able to cope with going to

University, and decided instead to work. Unfortunately, the types of jobs available to

someone with only a DEC were not the most challenging, and Sam quickly grew tired

of minimum wage employment. Sam began to seriously look at his options –

University still did not feel like it was the right choice to him, but he had been

seriously considering a technical degree. Finally, he decided that the degree with the

most potential for a career, would be a degree in computer network security.

After a gruelling year of study, Sam graduated from his program with one of the top

marks of his class. He began working almost immediately for a consulting company

that specialized in network security. Most of his time would be spent out of the office

visiting clients and developing security systems for their networks that would best suit

their needs. Another part of this first job, would be long hours on-call, where Sam

was equipped at home to answer his clients calls 24/7. Sam found his new position to

be challenging, but at the same time lonesome. He was often on the road, leaving him

to feel that he was unable to form the types of bonds within the company that would

lead to significant career advancement. However, before he could make a move to

better position himself, his company was sold to another firm, and after a few months

that included an office change for him, Sam along with some of his other co-workers

were let go through down-sizing.

High-tech jobs were scarce at this point in time, so Sam decided to try to begin his

own company. At the same time, he began to take courses for more network security

certificates, figuring that he would improve his qualifications for any jobs that might

pop up along the way. Eventually another job came along, and Sam found himself

again in a travelling position. However, this time the position meant that he would be

teaching seminars on network security, rather than consulting. The company he now

worked for, was a security software reseller, and it was Sam's job to teach companies

how to integrate and run their new security protocols.

While Sam worked his way up to a very high position in this firm in a short amount of

time, he still had his eyes and ears open for new and better career possibilities. What

was most interesting about this interview, was the fact that most of the contracts Sam

had received as an independent contractor had been through connections he had made

through school and through previous clients. Also, while his first job came about through a 'head-hunter', all of his subsequent jobs have come about through 'networking'. This seems to be a common thread in the high-tech, no matter what the particular field may be. Sam confirmed that all of the companies he has worked for have been decentralized in their organizational structure. It is only recently that he has begun to work for a more structured company, through the process of a merger.

The networking mechanisms in high-tech seem to provide high-tech professionals with the possibility of ladder climbing commonly seen in large companies; without the ladder. While this may suggests that high-tech professionals have little loyalty for their employers, Sam thought that job-hopping appears to be an accepted practice and integral part of high-tech professional culture. In keeping with this, upon last contact, Sam had made yet another hop.

Tim

Tim's first experiences with the computer was playing video games with his older sister and brother on a very special Christmas morning. As a family gift, his parents had bought the three children a Calico video game system to share. A few years after this, Tim found himself playing games on the family's home computer in his spare time, composing electronic music and searching a new technological innovation called the 'world wide web.' All of this time in front of the computer paid off for Tim, who won the Computer Science prize at his High School graduation.

While Tim had an acute talent for all the sciences, he had decided in his before last

year of High School that he wanted to become a Computer Engineer. This meant that

he would have to complete the Pure and Applied Sciences program in CEGEP in good

standing in order to get accepted into an Engineering program in University. Luckily,

his hard work throughout CEGEP paid-off, and Tim was accepted into his first choice

of program and university – he was well on his way to becoming a computer engineer.

After graduation, Tim was one of the lucky members of his graduating class to have

signed an employment contract before the dot-com burst that was still honored after

the market crashed. He was excited at the prospect of embarking on his 'real' life –

he had just moved out of his parents' house into a completely new neighborhood, with

new sights and sounds to experience, not to mention a whole new group of co-

workers to 'bond' with.

This was Tim's first full-time job, but he was no stranger to the high-tech work

environment. When asked about how he found his jobs while still at school, Tim

stated "I was lucky..." – both of his high-tech summer jobs had come from one

fateful night listening to music over the internet – Tim was impressed with the

applications on a particular web-site, and wrote the company to congratulate them on

their innovative use of programming, mentioning that he was studying computer

engineering. Within a day, the 'owner' of the website sent him a reply, thanking him

for his support and asking "Do you want a summer job?" Jumping at the opportunity

to work for a high-tech company, and the experience in the field that it would give

him; Tim spent his next two summers working for the two different companies that the owner of the website ran.

Tim was also 'lucky' as mentioned before, when it came to his first full-time job out of school. He had scouted-out a number of companies in the Montreal area that he felt he would enjoy working at, and interviewed with two others, before receiving an offer from the company he was starting at. His first few days at the company were spent getting accustomed to his new work environment and his new team. The company had a few hundred employees, and boasted an in-house daycare, a hockey rink, a cafeteria, a swimming pool, a basketball court, and even a fully loaded gym – all in place to offer employees more than just work. His new team was also filled with great people-people, as Tim had joined a customer support group that specialized in helping clients integrate the company's products into their products. This would often involve building new computer code, in order to help the client's machines and Tim's company's hardware communicate and function together.

Tim loved his job – it was challenging and changed on a daily basis; he liked having to think 'outside-of-the-box' in order to solve client problems, and the gratification he got from making their products a success. However, after a year and a bit of working there, the company went through a downsizing of its staff and Tim was let go. After having been so 'lucky' with his jobs in the past, Tim was now bitter after being downsized – he hated the fact that he had been let go from the company on a last-in-first-out basis, when he knew that his customer satisfaction ratings were much higher

than others in his group, and knowing that his coding skills were stronger than many in his group.

After a few weeks off the job, Tim received a phone call from one of his university buddies asking if he had thought of consulting – of helping the company his friend was working for, integrate one of the products from the Tim's ex-employer into a new product they were coming out with. At this new company, Tim was seen as an integration expert, and was hired as a consultant. When word got back to his old boss Christopher (at the company he had been laid-off from), that Tim had begun consulting on hard-to-solve integrations, Christopher sent clients Tim's way. Tim was again 'lucky' – new clients were coming in at a rapid rate, and Tim quickly had to start-up his own software development firm, including two employees to meet his initial demand, and get his projects out in time for their release deadlines.

After four years of running his own business – dealing with irate clients, a disloyal employee who stole code from the company, and having financing fall through for one of his big projects – Tim had to let his employees go, and scale back the types projects he took on. His dreams of making it big like Steve Jobs and Bill Gates, are still there, but he thinks he will need more experience, in the industry with different programming languages, and development techniques before he'll make it 'big'.