INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

Bell & Howell Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600

UMI[®]

**The New Economic Imperative:
The Development of High-Technology Clusters in Canada,
with a Case Study of Montreal**

By Matthew Ivis, B.A.

**A thesis submitted to
The Faculty of Graduate Studies and Research
in partial fulfillment of
the requirements for the degree of**

Master of Arts

**Mass Communication Program
School of Journalism and Communication**

**Carleton University
Ottawa, Ontario
September, 2000**

Copyright ©2000

National Library
of Canada

Acquisitions and
Bibliographic Services

395 Wellington Street
Ottawa ON K1A 0N4
Canada

Bibliothèque nationale
du Canada

Acquisitions et
services bibliographiques

395, rue Wellington
Ottawa ON K1A 0N4
Canada

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-57664-7

Canada

**THESIS ACCEPTANCE FORM
M.A. CANDIDATE**

The undersigned recommend to the Faculty of Graduate Studies
and Research acceptance of the thesis

**The New Economic Imperative:
The Development of High-Technology Clusters in Canada,
with a Case Study of Montreal**

submitted by Matthew Ivis, B.A.

in partial fulfilment of the requirements for

the degree of Master of Arts

Thesis Supervisor

Chair, School of Journalism and Communication

Carleton University

September, 2000

ABSTRACT

This research study examines the historical development of the 'new economy discourse' in Canada, and analyses some of the wider social, cultural, political, and economic ramifications that the implementation of this discourse is having at the local level. I argue that 'high-technology' clusters, particularly information, communication and telecommunications (ICT) clusters, are increasingly becoming the mainstream, neo-liberal perspective driving the development of the new economy. Through the case study of the province of Quebec and the city of Montreal, my research unveils how the pervasive belief of governments in the economic promise of high-technology clusters, combined with the increasing spatial mobility of capital, is having discernable impacts on local governance. Capital is attaining a more strategic position with respect to its relationship with different levels of government, thereby transforming the role of government from the regulator to the facilitator of capital. This transformation in the role of government has consequences on the everyday lives of people.

Table of Contents

I. Introduction ... 7

Methodology ... 8

Theoretical Framework: Space, Place and Power in the New
Economy ... 10

Spatialization as an Entry Point to Communication Research ... 11

Spatial Mobility of Capital: The rise of Global Capitalism ... 13

The Spatial Convergence of Business Activities ... 15

Governance: The Shifting Balance of Power ... 16

The State: Comprehending Its Role & Nature ... 19

Theoretical Framework: Conclusion ... 22

II. Examining the Mainstream Neo-Liberal Approach to Economic Development: High-Technology Clusters, the New Economic Imperative ... 27

The Constitutive Role of ICT Clusters ... 29

The Anatomy of High-Technology Clusters ... 31

Anchor Companies ... 34

Participative Early Stage Capital ... 34

A Highly-Skilled Talent Pool ... 34

World Class Universities and Research Institutes ... 35

Entrepreneurial Culture/Conducive Environment ... 36

Corresponding & Responsive Support Services ... 36

Geography of High-Technology Clusters ... 37

III. Developing the Discourse: A Historical Perspective on the Emergence of the New Economy in Canada ... 44

International Telecommunications, 1960s - 1990: Decades of
Change ... 44

Domestic Response: Canada and the Formation of the New Economy
Discourse ... 52

<i>Science and Technology Policy in the Post-War Era ...</i>	54
<i>Science and Technology in Post-WWII America ...</i>	55
<i>Science and Technology Policy in Canada ...</i>	58
<i>Integrating Science, ICT Policy & Industry ...</i>	60
<i>Developing the Discourse of the New Economy ...</i>	61
The New Economy 'Take-One': The Failure of TELIDON ...	63
<i>TELIDON: the Technology ...</i>	64
<i>The Pervasive Acceptance of TELIDON Within Canadian Society: Witnessing the Technological Imperative ...</i>	65
Developing the Discourse, A Historical Perspective: Conclusion ...	67

IV. Establishing the Dominant Discourse: Technological Nationalism - From the Information Highway to the Internet, and Beyond ... 70

Establishing the Dominant Discourse ...	71
Refining & Implementing the Discourse: Electronic Commerce, the Killer Application - E-Business, the Way of the Future ...	75
From E-commerce to E-business: The New Economic Imperative in Canada ...	78

V. Applying the New Economic Imperative at the Provincial and Local Level: The Case of Quebec & Montreal ... 86

The Province of Quebec: Branding Itself in the Global Marketplace ...	87
<i>Quebec, A Strategic Location ...</i>	90
<i>A Large Pool of Highly-Skilled Workers ...</i>	90
<i>World Class Universities and Research Institutes ...</i>	91
<i>High-Tech Sectors of Excellence ...</i>	91
<i>Competitive Operating Costs & Conducive Business Environment ...</i>	92
<i>Leading Centre for Venture Capital ...</i>	92
Transforming Montreal: The Development of a High-Technology District ...	94
<i>The Anatomy of the Montreal ICT Cluster ...</i>	98

*The New Economy in Montreal & the Role of the State: A Mutually
Constitutive Relationship ... 101*

The New Economic Imperative at the Provincial and Local Level:
Conclusion ... 103

VI. Reconstituting Space: Montreal as a Post-Industrial City ... 105

The Cité du Multimédia ... 107

E-Commerce Place ... 112

Conclusion: Post-Industrial Spaces as Social, Cultural and Political
Projects ... 117

VII. Labour, Culture & the New Economy in Quebec ... 120

Education: A Cultural & Economic Institution ... 121

The 21st Century Labour Force: Reconstituting the Education System in
Quebec ... 125

*The Ascension of Economic Rationality in Education & Labour
Market Policy ... 125*

Producing a Technological Culture ... 128

*Institutionalizing Bilingualism in Schools: English as the
International Language of Business ... 130*

Competing Discourse & The Politics of Language, Culture &
Economy ... 133

VIII. Conclusion: The New Economy in Canada ... 138

References ... 144

List of Figures

- 1. Formation of E-Business Clusters: Canadian E-Business Opportunities Roundtable ... 32*
- 2. Formation of E-Business Clusters: Joint Venture: Silicon Valley ... 33*
- 3. Macroeconomic Impacts of Digital Economy in the US ... 39*
- 4. Macroeconomic Impacts of E-Business in Australia ... 40*
- 5. Macroeconomic Impacts of E-Business in Canada ... 41*
- 6. Industry Canada's Connecting Canadians Initiative ... 77*
- 7. The Scope of E-Business in Relation to E-Commerce ... 82*
- 8. The Telecommunications Industry in Quebec, 1997 ... 99*
- 9. The Computer Industry in Quebec, 1997 ... 99*

I. Introduction

This research study examines the emergence, development and potential impacts of the 'new economy' in Canada. This new economy, driven by the development of what have been termed 'high-technology clusters', is the imperative upon which, increasingly, the future of Canada and its society is said to rest. High-technology 'clusters', the increasingly mainstream, neo-liberal approach to economic development, refers to the geographic agglomeration and networking of all the key business activities necessary for the efficient functioning of a particular high-technology sector so that it can accelerate the process of innovation. The focus of this research study is primarily on the information, communication and telecommunications industries which, when taken together, are commonly referred to as the ICT sector.

The creation of an ICT high-technology cluster, refers to the building of dense business networks within a geographical area, which includes all the key elements required to allow the ICT sector to flourish and innovate. Some of these elements are said to include a properly trained labour force, venture capital, universities and research institutes, established companies, support services such as accounting and advertising, and a regulatory and legal environment conducive to the growth of the sector. When all the requisite elements are placed together and begin to network, a cluster of economic activity emerges. This cluster of economic activity is viewed as being the key to innovation, the primary driver of economic growth.

My discussion of high-technology clusters, as the increasingly mainstream, neo-liberal perspective towards economic development (chapter 2), is based upon works produced by private sector sources, national research institutes and research conducted under the direction of international economic organizations.

My discussion pertaining to the historical development of the 'new economy discourse' in Canada (chapters 3 & 4) draws upon a combination of scholarly accounts, as well as federal government documents and research reports. The scholarly accounts in this section include works that reflect both historically on the issue, and those that were written during the particular time periods.

The case study of the province of Quebec and the city of Montreal (Chapters 5, 6 & 7) incorporates: scholarly accounts; provincial documents, research reports, press releases and promotional materials; information produced by regional economic development entities funded by both the public and private sector; newspaper articles, and; interviews with industry executives. Throughout the entire study, and especially with respect to the case study, I employ the most recent data available.

Montreal is chosen as the object of study over other major Canadian centres because the province of Quebec and the city of Montreal have been the most deliberate and vigilant in implementing policies aimed at facilitating the growth of the new economy. Moreover, Montreal has been relatively successful, due in

large part to such policies, in transforming its economy from a rusting industrial base to a burgeoning high-technology centre.

Theoretical Framework: Space, Place & Power in the New Economy

We must be insistently aware of how space can be made to hide consequences from us, how relations of power and discipline are inscribed into the apparently innocent spatiality of social life, how human geographies become filled with politics and ideology (Soja, 1989: 6).

In order to accomplish the abovementioned research goal, I aim to apply a critical theoretical approach. Specifically, I apply the concept of *spatialization* as an entry point to research, and argue that the spatial mobility of capital and the spatial convergence of business activities, combined with the belief in the economic potential of high-technology clusters, is impacting the way in which regions and cities are governed.

The governance of localities is being transformed in an attempt to attract the 'golden egg' of high-technology development. As a result of this transformation, the balance of power in the relationship between capital and the state is shifting in favour of capital, thereby having measurable ramifications on the social and cultural lives of people. Therefore, I argue that the gravitation of global ICT high-technology firms to particular regional clusters is not merely the manifestation of the natural evolution of economic relations as some insist (Heath, 1999). Rather, it represents the result of fierce regional competition for the potential of economic growth, which, in turn, is having profound implications on the socio-

cultural dimensions of people's lives. The following discussion outlines some of the key research assumptions that drive the analysis presented throughout this research.

Spatialization: An entry point to communication research

"Space and time are basic categories of human experience" states Harvey (1990: 202), "yet we rarely debate their meaning." Spatialization, which is similar to what Harvey conceptualizes as time-space compression, is an entry point or conceptual tool that aids in overcoming Harvey's perceived deficiency in social theory. Hence, spatialization refers to "the process of overcoming the constraints of time and space in social life" (Mosco, 1996: 173). The concept allows researchers to delve into this process and uncover how transformations regarding constraints over time and space influence the wider realms of social, cultural, political and economic life. While concerns and debates have been aired over issues related to space and time within the study of communication as well as across the social sciences, "this issue has received comparatively little academic attention" (Ferguson, 1990: 153).

To date, critical communication study has engaged the issue of spatialization largely through analysing it as the "institutional extension of corporate power in the communication industries" via the concentration of ownership and the growth of multinational corporations (Mosco, 1996: 175). Paradigmatic of this is Herman and McChesney's (1997) work which meticulously maps-out the

extension of global media through the processes of acquisitions and mergers. In short, much of the work in this area has been concerned with the processes and impacts related to the vertical and horizontal integration of media companies both within and across national borders.

Beginning from a different point of departure, the use of spatialization in my analysis "starts from the political economy of capitalism, which constitutes the process of rezoning, in part, by stratifying and concentrating the power to do so along class, race, and gender lines" (Mosco, 1996: 206), and is employed "as a means of understanding the relationship of power-geometries to the process of constituting space..." (Mosco, 1996: 174-175). Hence, my research applies the concept of spatialization to examine the development of high-technology clusters within particular regions and, moreover, to delineate some of the wider social, cultural, political and economic implications associated with their development.

Specifically, the focus here is placed on "corporate restructuring" and the subsequent "changes in the spatial patterning of business" (Mosco, 1996: 199). The analysis is thus concerned, primarily, with three particular dimensions of spatialization: the spatial mobility of capital, the spatial convergence of business activities and the shifting balance of power in local governance that is associated with the establishment of the high-technology industries in particular areas.

Spatial Mobility of Capital: The Rise of Global Capitalism

The first dimension, the spatial mobility of capital, is a key element in understanding some of the profound macroeconomic transformations that have, and continue to impact national, regional and local economies. Following the long-standing critical tradition of Karl Marx¹ on this subject, Ross & Trachte (1990) provide a robust account of the concept of the spatial mobility of capital. The authors assert that "[D]uring any given era of capitalism, a definite spatial arrangement of production can be discerned. Leading enterprises make investments across space in a manner designed to maximize their rates of capital accumulation" (1990: 83). According to Ross & Trachte, this spatial arrangement is being altered and thus there is a new mode of capitalism emerging, *global capitalism*.

The emergence of global capitalism is facilitated by a series of technological developments in transportation and communications (Ross & Trachte, 1990: 62-63). Rapid transportation and communications allows capital to become mobile and therefore less reliant on the national and local policies that have traditionally shaped its operating environment. Due to these technological developments, capital is now able to move to a location that is the most amenable to its particular needs. An example of this, drawn directly from my analysis, is

¹Karl Marx explores this concept quite thoroughly in the *Grundrisse*, where he examines the correlation between the expansion of communication and transportation networks and the capitalist accumulation process.

multinational ICT companies which are able to pick and choose the locations where they will locate particular aspects of their business activities. The rapid development of transportation and communication systems allows multinationals to divide-up their production process and rearticulate it in many different possible combinations, for example: engage in research and development in the United States, manufacturing in Brazil and marketing and after-sale services in Canada. In turn Ross and Trachte purport that global capitalism is changing the economic geography of the world: "leading firms in many sectors have been compelled to form new strategies of capital accumulation. Those strategies amount to a restructuring of capitalism from a monopoly to a global variant" (1990: 82).²

This process is having a discernable impact on the strategic relationships between capital and the state, capital and labour, and the state and labour - in favour of capital. With capital having an increasingly powerful position with respect to the location of its business activities, governments are increasingly inclined to attract and retain capital rather than to regulate it. Of paramount interest for Ross & Trachte is that "the threat of capital mobility becomes a potent weapon in the old contest between labour and capital" (1990: 7). The cost of labour is thus the primary determinant of the new economic landscape.

²For a full discussion on Monopoly Capitalism, see Paul Baran and Paul Sweezy's *Monopoly Capital* (1966).

My research builds upon the theory of the increasing spatial mobility of capital, however, it differs from Ross & Trachte's account in that it views six areas key to the emergence and sustainable development of ICT high-technology clusters as being the paramount determinants of the new economic geography: anchor companies; participative early-stage capital; a highly-skilled talent pool; world class universities and research institutes; entrepreneurial culture/conducive environment, and; corresponding and responsive support services (these six areas are discussed more in depth in chapter two). Therefore, I claim that when discussing ICT high-technology clusters, the issue is much more complex than merely the cost of labour.

The Spatial Convergence of Business Activities

The second dimension, spatial convergence, refers to the agglomeration of related firms in the same physical space (Mosco, 1999). This issue has been relatively overlooked within critical communication research, as Mosco (1999: 105) explains:

One of the reasons for the lack of attention is the widely held view that communication and information technology eliminates the importance of place by making it possible to carry out complex activities over vast distances.

This is not a recent view. Marx (1973: 539) remarked on the power of capitalism to "annihilate space with time" over a century ago. Today there is considerable attention paid to the "death of distance" (Cairncross., 1997) and "the end of geography" (O'Brien, 1992). These conclusions ... contain important insights on the expansion of global business. But in their overstatement, they miss the importance of face-to-face contact and the ability to draw on rich local resources that dense physical networks provide. This is leading scholars to pay more attention to the ways in which *spatial convergence is transforming* if not

annihilating space (my emphasis).

With high-technology clusters, particularly ICT clusters, increasingly viewed as the key to innovation and thus economic development, thereby ascending to the position of the new economic imperative, governments and regional economic development corporations/agencies are investing significant resources towards facilitating the spatial agglomeration of these businesses. My analysis also focuses on the process of spatial convergence in the form of high-technology clusters to investigate the origins of this process and its impacts on space, power and labour in Canada. Of particular interest here are the attempts by industry, government and regional economic development agencies to brand specific places and/or spaces as conducive for high-technology investment and development. These actions, as discussed later through the case study of Montreal, have significant impacts on the socio-cultural aspects of peoples lives via the constitution and reconstitution of space within cities and regions. Chapter six provides two concrete examples of this process: the Cité du Multimédia and E-Commerce Place.

Governance: The Shifting Balance of Power

The third dimension, which is closely related to the first two, concentrates on explicating the shifting balance of power brought about by high-technology companies and the products and services they create. This notion, as developed by Robins and Gillespie (1992), asserts that a spectrum of

possibilities, including spatial possibilities, has been opened by information and communication technologies, however, these possibilities are narrowly limited and constrained due to the focus of their designed implementation and use.

It is a matter of repertoire of strategies, dependent upon situated contexts and also upon balances of power. The key issue, now as always, concerns the division and integration of labour. The logic of organisation involves fragmentation, but this is always predicated on the rearticulation and reintegration of components: 'production systems must be physically linked up; their labour processes must be coordinated; and the flows of material, labour, and information between them must be regulated' (Robins & Gillespie, 1992: 159).

The deployment of ICTs throughout the Canadian economy and society and the development of high-technology clusters are, as Robins and Gillespie denote, 'rearticulating' or 'reintegrating' the components of the capitalist production system. This rearticulation is akin to the emergence of 'global capitalism' as described above. Moreover, this new mode of capitalism is also changing the means of accumulation and, therefore, the strategies and policies aimed at stimulating economic growth. The result of these changes is a shifting balance of power between capital and the state: "as the power of capital in relation to state policy increases, the "relative autonomy" of the state decreases" (Ross & Trachte, 1990: 10). This can be witnessed, in varying degrees, at both the national and local levels. The analysis presented in this study examines how the (re)construction of space (i.e. building industrial parks instead of public housing) and education denote a key shift in the balance of power: away from the state and the interests of labour and citizens, and towards the needs of capital.

In sum, along with examining issues related to the spatial mobility of capital and spatial convergence, the analysis presented here explores the ways in which these two issues affect the restructuring of capital in the form of high-technology clusters, to identify the changing nature of power; particularly within the spheres of labour, culture and governance at the local level.

The utilization of spatialization, as discussed above, requires an understanding of how space and time are regulated. This is especially true since a major aim of this study is to outline how the discourse surrounding social and economic regulation, at the national, provincial and local levels, has been transformed. My argument follows that of Lash & Urry (1994: 12), as I contend that institutions of economic regulation figure at the same time to be institutions of spatial regulation. Therefore, even though there is a new mode of capitalism emerging, *global capitalism*, "the basic rules of a capitalist mode of production continue to operate as invariant shaping forces in historical-geographical development" (Harvey, 1990: 121). In turn, a core assumption upon which this paper is premised is that just because spatial barriers *can* be overcome does not necessarily mean that they *are* being overcome. Rather, it must be understood that spatial constraints become reworked for the purposes and needs of capital (Graham & Marvin, 1996: 99) which, consequently, has an impact on the spheres of culture, politics and labour.

This process is far from linear, however, as Mosco (1996: 206) points out: "the

choice of the term 'spatialization' is precisely intended to point to (the) process of constant spatial change." This process is dynamic and *mutually constitutive*: economic institutions (capital) alter spatial regulations and these changes, in effect, alter the economic institutions themselves. Thus as Massey (1984: 6) asserts "it is not just that the spatial is socially constructed; the social is spatially constructed too." This approach, therefore, can be viewed as building upon the literature and research of Karl Marx and theorists associated with the Chicago School of Urban Sociology.

The State: Comprehending Its Role & Nature

To this point the discussion has centred, primarily, on the role of capital in the spatialization process. While it is important to look at capital and economic factors, it is also imperative to examine the state and political and social factors as well. As Murdock (1990), Mosco (1996), and Mosco & Reddick (1997) illustrate, the state plays a constitutive rather than a reactive role in the development and implementation of policy. Thus, by design or fault, through its policies, the state facilitates the need and desire of capital to overcome the constraints of time and space to maximize accumulation. For instance, policies promoting commercialization, privatization, liberalization and internationalization all promote the reconstitution of the space in which capital operates. More directly, each of these policies aim to expand the accumulation process of capital by reorganizing the spatial conditions of the market. A practical example of this process, as discussed in Chapter three, is the 1986 Uruguay Round of the

General Agreement on Tariffs and Trade (GATT). It was in this round of international trade negotiations that governments introduced telecommunications, thereby expanding the economic geography of the industry from the national to a global market. As such, spatialization must be understood as mutually constituted through the actions of both capital and the state.

It is also important to consider the way in which we address *the government*. Up until this point, for the purpose of illustration, the government has been discussed as a single united entity. Yet no government can be conceptualized or comprehended as a monolithic or homogenous entity. Rather, the state must be understood as an institution comprised of many agencies and departments within which exist many competing discourses. A succinct and pertinent example of this is the competing discourses between the Department of Canadian Heritage and the Ministry of Industry Canada³ regarding the very nature of the new economy itself. Heritage Canada has taken the position that ICTs should be adapted to serve social purposes. Conversely, the Ministry of Industry Canada proclaims that the economy must change in order to both accommodate and exploit new technologies in order to accelerate the process of innovation. Up to this point, and for the foreseeable future, it has been Industry Canada's position that has been championed and thus implemented and, as such, receives the

³In 1993 the Department of Communications was dissolved. One of the results of this was the creation of the Ministry of Industry, which inherited, among other things, responsibility over ICTs, while a new department, Heritage Canada, was created and given the responsibility of developing and promoting Canadian culture, which includes the cultural industries (i.e. broadcasting, publishing, etc.).

majority of attention in this study.

The preference and acceptance of Industry Canada's vision of the new economy is most clearly evident in that the Connecting Canadians Initiative, the Electronic Commerce Branch, the Information Highway Applications Branch, and the Information and Communications Technologies Branch are all housed within the Spectrum, Information Technology and Telecommunications (SITT) Sector of Industry Canada. Thus, the SITT Sector represents the federal government nexus point for high-technology and new economy issues.

Furthermore, within the SITT Sector of Industry Canada itself there are a number of competing visions and discourses both *between* and *within* branches with respect to applying the policy instruments necessary to facilitate the development of the new economy. Within government, as within all other areas of society, there are competing discourses and battles over the resources (i.e. funding, political will, etc.) necessary to implement a particular vision and/or discourse. Hence, while at times during this research study the term '*the government*' may be employed, it is always used within the above-described context of competing discourses.

The reason for discussing the issue of competing discourses is that the accentuation or promotion of certain discourses over others represents conscious human agency. In this respect, my approach aligns itself with that of

Robert Babe which aims to "reintroduce the 'soiling trace of origin or choice', re-establishing thereby human responsibility," for "[I]n no sense did (technologies) introduce themselves. They did not descend from the clouds, nor did they make 'natural' any particular industry structure. Rather, our communication industries took shape and developed through the agency of and the struggle for human power" (1990: 4-5).

Theoretical Framework: Conclusion

The new core economic institutions that regulate space, place and power are increasingly the information, communication and telecommunications industries (Lash & Urry, 1994: 17). In turn, this issue constitutes an important area of research, not only because these industries are becoming the primary economic institutions of spatial regulation, but also because the products and services these industries produce are fundamental to the overall spatialization process itself. The ICT sector and the development of ICT high-technology clusters, is the key component in the economic blueprint now being developed and implemented to drive Canada into the new economy. As such, it is imperative that a wide range of scholars interested in communications issues engage this subject. It will be the research conducted in these areas that will influence the policies that, in the end, will affect all of us who participate in the new economy.

Informed by this theoretical framework, the remainder of this research study aims to investigate how the new economy and the discourse created to propel its

ascendence has developed within the Canadian context and to illustrate some 'local' impacts associated with the emergence and implementation of this new mode of capitalism through the case study of Montreal.

The next chapter begins this process by outlining the mainstream, neo-liberal economic approach to high-technology development which is ascending to the position of the new economic imperative: *clustering*. The discussion focuses on the core assumptions that underpin the neo-liberal approach, specifically, the anatomy and geography of high-technology clusters.

The third and fourth chapters examine the historical development of the discourse surrounding the emergence of the new or knowledge-based economy/society in Canada. Chapter three investigates the post-WWII era until 1993, and chapter four concentrates on the time period of 1993 to the present, which includes a discussion on the progression of the discourse from the information highway, to the Internet, to e-commerce and now e-business as the "killer" application in the new economy. The argument sustaining these chapters is that the discourse surrounding the new or information/knowledge economy/society is not a new phenomenon, but rather the product of decades of policy, technology, economic and regulatory developments. There is a rich political and economic history in Canada with respect to this issue, which is often overlooked in favour of a forward looking, technology-centric vision. The purpose of chapters three and four, thus, is to outline this history, thereby

providing a much needed context with regard to the emergence of the 'new economy' and the 'new economic imperative' in Canada.

Building upon this context, chapters five, six and seven examine the practical implementation of the new economy discourse through the case study of the Montreal ICT high-technology cluster. The purpose of this analysis is to "provide a clearer sense of what happens to the social and cultural lives of people when globalization hits the ground" (Mosco, 1999: 114).

Specifically, chapter five analyses the provincial strategy employed to cultivate the development of high-technology clusters in Quebec. After which, the discussion turns towards the Montreal ICT high-technology cluster in particular, and examines the role of both the local government and foreign capital in its development.

Chapter six investigates one of the key elements in provincial and local governments' strategies to attract and retain foreign high-technology firms: the construction of post-industrial economic spaces. Through the examination of the Cité du Multimédia and E-Commerce Place, two massive new economy infrastructure projects undertaken by the provincial and city governments, chapter six illustrates how the government's role has been altered: from the regulator of capital to the facilitator of capital. The discussion here illustrates an important conclusion of my research: the state plays a central role in developing

and organizing the physical and economic space of the new economy.

Chapter seven examines the creation of the high-technology labour force in Quebec and illustrates some of the profound and contradictory implications that arise with respect to the provincial government's socio-cultural and economic policy agendas. In particular, the discussion focuses on the potential irrigation of the Quebecois culture and French language with the development of high-technology clusters.

Through the analysis provided in chapters five, six and seven, I aim to demonstrate some of the important social, cultural, political and economic impacts that are associated with the 'emergence of the new economy' in Canada, which are often overlooked due to the application of a purely economic or technocratic perspective to this subject. Through the discussions in these chapters, a central finding of my research emerges: the strategies employed by the Quebec government to achieve the successful development of high-technology clusters demonstrates the supremacy of economic rationality over cultural considerations in the formation of public policy. These public policy decisions, driven by a purely economic rationality, are reconfiguring urban spaces into post-industrial economic spaces, which in turn, are impacting the everyday political and cultural lives of people. These impacts are felt in areas such as language, education and labour.

In sum, there will be both positive and negative ramifications associated with the development of the new economy in Canada. The point here is to assess and understand the issue in order to put forward an informed, socially constructive contribution to the debate surrounding the 'new economy' in Canada.

II. Examining the Mainstream, Neo-liberal Approach to Economic Development: High-Technology Clusters, the New Economic Imperative

Understanding technical change and innovation is crucial for understanding the dynamics of "knowledge-based economies" and "learning societies" (Roelandt and Hertog, 1999: 12)

In a global knowledge-based economy *innovation* is viewed as the key to economic growth. In order "to improve innovative capacity and competitiveness many nations have focussed their industrial and technology policies over the last few years on the importance of strategic alliances and networking between business and research institutes" (Netherlands, 1997: 3). The desire to cultivate an innovative economy via **networked** relationships has thus resulted in the application of new approaches to economic development.

Traditionally, as Roelandt and Hertog point out, perspectives on economic growth have been dominated by a sectoral approach, which specifies strict boundaries for industries or sectors (mostly based on some statistical convention), compared by country, and focussing on strategic groups of similar firms with similar network positions (1999: 12). This approach has led to stark demarcations between the development of particular industries/sectors and, subsequently, between the strategies employed to develop them.

In contrast, the systems of innovation or cluster approach challenges these traditional economic notions and asserts "that the competitiveness of companies

is becoming more dependent on complementary knowledge acquired from other firms and institutions ... (and that) interactions are intensifying between firms and a number of other institutions involved in the innovation process, such as universities..., consultancy and technical service providers and regulatory bodies" (Guinet, 1999: 7). As such, the cluster approach places emphasis on intense networking and interdependence between a host of different industries and entities (i.e. business, governments, education/research institutions, etc...), and stresses that "innovation is not the activity of a single company (like the "heroic Shumpeterian entrepreneur"), but rather it requires an active search process to tap new sources of knowledge and technology and apply them to products and production processes" (Roelandt and Hertog, 1999: 10). Therefore, the "need to integrate value chains has meant that the most innovative networks often cross conventional boundaries between businesses and sectors simply because new combinations of markets and technologies call for new forms of division of labour... (these) market processes... (have) led to the emergence of *clusters*: networks and value chains of suppliers, customers and/or knowledge institutes, with the aim of creating innovative value added" (Netherlands, 1997: 5)

Advocates of the cluster approach point to the documented successes of the high-technology clusters⁴ developing in the United States (Canadian E-Business

⁴Note: Industry Canada (1998a; 1998b) classifies high-technology industries into three categories: environmental technologies; enabling technologies (which include applications of information technology, bio-technology, advanced manufacturing, and advanced materials); and aerospace and defence.

Opportunities Roundtable, 2000; Joint Venture, 1999). In particular, Silicon Valley, the birthplace of the high-technology cluster, is put forth as the template, or prototype, for industrial development in the twenty-first century. This is due to reports such as the one from Stephen Shepard, editor in chief of *Business Week*, which states: "In Silicon Valley, 11 new companies are created every week. Last year, these new businesses went public at a rate of four per month, minting 300 new millionaires along the way" (Smillie, 1999).

The success of these high-technology clusters, especially ICT clusters, has fuelled the ascension of this approach to the status of the mainstream, global, neo-liberal perspective, that is now being applied to facilitate the development of *the new economy*. A clear example of the pervasiveness of this approach can be found in the July 2000 edition of *Wired* magazine, where the top forty-six global high-technology clusters are examined. The survey includes cities and regions from countries spanning the globe, including Brazil, India, South Africa and Taiwan, in addition to the United States, Canada, and Western Europe.

The Constitutive Role of ICT Clusters

It is important to recognize, for analytical purposes, that ICT clusters play a constitutive role in the development of all high-technology clusters. ICT clusters, including Internet and/or e-business clusters, are based upon the production,

deployment and use of ICT products and services. All other high-technology sectors, be it advanced manufacturing or biotechnology, depend on implementing and embedding these ICT products and services into their business processes and supply chains, even though this is not their core business. A cluster's ability to innovate is based upon the ability to exchange, manipulate and leverage vast amounts of information, data, knowledge and ideas through the communications/information networks developed, produced and established by the ICT sector. Hence as Health (1999) proclaims, the ICT high-technology cluster is the *core cluster*, as the products and services it produces are essential to the development of all non-ICT high-technology clusters. Health (1999:184-185) furthers this logic by arguing, "[I]n addition to their (the non-ICT high-technology sectors) technological links to the core sector, these firms exploit the core sector's management style, entrepreneurial practice and lender resources. For example, the President of the World Heart Corporation comes from a telecommunications company."

Building on this brief introduction to the concept of high-technology clusters, the remainder of the chapter investigates and outlines some of the key features of ICT high-technology clusters. In particular, the discussion focuses on the specific anatomy and geography distinct to high-technology clusters.

The Anatomy of High-Technology Clusters

As described above, high-technology clusters comprise of a complex of networked and interrelated relationships within and across industries, involving both the public and private sector, aimed at exchanging, collecting and manipulating information, knowledge and ideas for the purpose of innovation. While there are a number of paradigms that attempt to illustrate the dynamic nature of this phenomenon (Canadian E-Business Opportunities Roundtable, 2000; Joint Venture, 1999; Heath 1999), the literature demonstrates that six key elements are critical to the successful emergence and sustainable development of high-technology clusters: anchor companies; participative early-stage capital; a highly-skilled talent pool; world class universities and research institutes; entrepreneurial culture/conducive environment, and; corresponding and responsive support services. While the level of emphasis placed on each of these six dimensions differs depending on who presents the paradigm (see figures 1 & 2 for example), each of the six dimensions are usually present.

Clusters: New E-business Characterized by Virtuous Circle of Growth

Source: BCG analysis based on interviews and research, 2000

FIGURE 2

Clusters:

This synergistic combination of factors distinguishes the Internet cluster regions as ideal fertile environments for nurturing sapling ideas into giant companies.

Source: Joint Venture, 1999

1. Anchor Companies

Companies, such as Microsoft and Amazon.com in Seattle, act as an 'anchor' for high-technology clusters, by providing a critical mass of talent and capital. This critical mass of talent and capital, in turn, acts as the key resource that feeds into the development of new spin-offs and start-ups. Nortel Networks, for example, has spun-off 55 high-technology companies in Canada (Canadian E-Business Opportunities Roundtable, 2000: 27).

2. Participative Early-Stage Capital

Seed money and venture capital play a crucial role in the development of high-technology clusters by taking an active role in the development of a business idea. The most pertinent example of this is Silicon Valley: "No other Internet cluster region attracts more capital than Silicon Valley, which accounts for more than one-fourth of all venture capital invested in the US... venture capitalists tap personal networks of management talent, tech-savvy lawyers, technical expertise and potential business partners to fortify new business ventures" (Joint Venture, 1999: 15). Venture capital, therefore, provides the critical funding and business expertise necessary for entrepreneurs to transform their ideas into businesses.

3. A Highly-Skilled Talent Pool

A recent working paper issued by the Business Council on National Issues (BCNI) (BCNI, 2000: 4), asserts: "The shift toward knowledge work in all advanced economies makes the development and retention of human capital even more important than the flow of money. In the old economy, many went to

where the natural resources could be exploited most efficiently. Today, money flows to where it can find the right people.” This assertion is reinforced by a survey of the top 125 Internet executives in the United States, who ranked access to a pool of qualified, skilled labour as the number one reason in determining the location of their Internet companies (Joint Venture, 1999: 13). Thus, a pool of skilled labour is a key ingredient in the development of high-technology clusters.

4. World Class Universities and Research Institutes

In addition to a highly-skilled labour force, high-technology clusters require world class universities and research centres. These institutions provide fertile grounds for pre-market and blue sky research that can be cross-fertilized with industry. In turn “the university is an increasingly powerful force in the knowledge economy, both because its brains are greater assets than ever before and because of a growing trend in which institutes of higher education see themselves as generators of business, whether (it be) professors’ start-ups or technology licensing deals” (Goldberg, 1999). The Massachusetts Institute of Technology (MIT), in its 1997 report, *The Impact of Innovation*, claims that the economic benefits flowing from the university are quantifiable and impressive: companies founded by MIT faculty and/or graduates employ 1.1 million people, 14,000 of which are in the Cambridge area alone; and, the graduates of MIT, if assessed as an independent nation, would have the 24th largest economy in the world with a GDP (roughly estimated at US\$116 Billion) larger than Thailand, but

smaller than South Africa (MIT, 1997). The University of California, the University of Alberta and the University of Toronto have all produced similar reports calibrating the regional economic impact of university-based research and innovation (Goldberg, 1999; Munroe-Blum, 1999; University of Alberta, 1999).

5. Entrepreneurial Culture/Conducive Environment

Both business and government have a key role to play in the development of high-technology clusters. Business has to be able to take risks and invest in innovation, technology, labour and ideas. Moreover, local and national business associations and media can act as a catalyst by providing support and positive coverage of the industry (Canadian E-Business Opportunities Roundtable, 2000). The government, for its part, has to create a clear, fair and transparent legal and business environment, while simultaneously acting as a model-user of the technology. When taken together, the efforts of business and government creates an attractive environment for investment and thus cluster development.

6. Corresponding & Responsive Support Services

Finally, for the successful development of high-technology clusters, there is the need for support services, such as advertising, accounting, legal and business consulting, that are amenable, knowledgeable and up-to-date with the new and innovative nature of high-technology companies. One of the central reasons why New York's 'Silicon Alley' has emerged as a leading cluster in the development of Internet content is because its traditional media and entertainment service

industries have quickly made the transition to the on-line world (Canadian E-Business Opportunities Roundtable, 2000).

Furthermore, as the *Report of the Canadian E-Business Opportunities Roundtable* (2000: 23) asserts with respect to e-business cluster formation, “although each cluster has been shaped by its unique history and circumstances, they share some characteristics and are descended from a similar set of catalysts ... [O]nce established, the networking opportunities and technological synergies that these catalysts facilitate tend to result in a gravitation of IT (information technology) talent and ideas to the area.” In other words, the cluster approach purports that once these six elements are in place and each dimension is actively participating and interacting with one another, there is a self-sustaining cycle of positive growth and capital accumulation. Quite simply: more dynamic opportunities attracts more talent, which creates more dynamic opportunities, attracting more funding, which attracts more talent, etc.

The Geography of High-Technology Clusters

[T]he much-trumpeted knowledge (or information, or innovation) economy has its own geography, and it consists of much more than Silicon Valley (Goldberg, 1999).

At a time when ICTs are being deployed throughout the economy and our everyday lives, it seems rational to assert, as some have (Drucker, 2000; Cairncross, 1997), that space and place are becoming increasingly irrelevant.

Ironically, this is far from the truth and, in fact, geography is becoming increasingly relevant, especially to high-technology firms. This position is clearly expressed in a recent report examining Internet clusters in the United States: "due to the industry's extreme growth rate, increasing competitiveness and required pace of innovation, Internet executives regard their companies' locations as critical to their success. In an industry where "time to market" distinguishes the Wall Street darlings from the Web's also-rans, it is not accidental that Internet companies have gravitated to the geographic pockets, or regional clusters, which share these characteristics" (Joint Venture, 1999: 4). Parenthetically, this sentiment has been echoed with regard to the entire realm of 'high-tech' industries and/or the knowledge-based economy (Goldberg, 1999; DeVol, 1999; Kotabe & Swan, 1998).

Initial research in this area seems to support much of the wild speculation accompanying the development of these nascent clusters. For example, recent macro-economic studies conducted in Canada, the United States and Australia⁵ assert that over the next three to seven years, the economic impact of the digital economy (United States) and e-business (Canada & Australia) will continue to be tremendous (see figures 3, 4 & 5).

⁵Note: these studies are distinct, use different methodologies and thus are not directly comparable. To date, there are no internationally comparable data on this issue due to a lack of agreement on standardized definitions and indicators, however, important steps have been taken in the Organisation for Economic Cooperation and Development's (OECD) Working Party on the Information Society (WPIE) and Working Party on Indicators for the Information Society (WPIIS) to create standardized definitions and indicators to overcome this challenge.

FIGURE 3

**Macroeconomic Impacts of Digital Economy
in the US**

IT producing industries accounted for 35% of GDP growth in the U.S. (1995-1999)

Productivity

IT accounts for half or more of the recent acceleration in U.S. productivity growth from 1.4 percent per year during 1973-1995, to 2.8 percent since 1995.

Employment

By 2006 almost half of the U.S. workforce will be employed in industries that are major producers or users of ICT products & services

Source: US DOC, Emerging Digital Economy 2000

FIGURE 4

Macroeconomic Impacts of E-business in Australia

Australian GDP estimated to increase by 2.7% by 2007, if Australia adopts greater use of E-com

Productivity

3.2% increase in Australia's consumption potential after 10 years, equates to a potential increase of \$10B over the next decade or \$500 per capita/per year

Employment

E-commerce changes employment opportunities, with variations across sectors. Overall, employment will expand with increased use of E-com

Source: Australia, *E-commerce-Beyond 2000*

FIGURE 5

Macroeconomic Impacts of E-business in Canada

Canadian GDP estimated to increase annually by approximately 0.6% to 2003 and currently contributes 1.5% of total GDP

Productivity

Such increases to GDP translates into substantial increases in productivity and competitiveness

Employment

E-business could contribute more than 180 000 new jobs by 2003

Source: Report of the Canadian E-business Opportunities Roundtable

These economic impacts have not been lost on regional and municipal leaders.

There is now a pervasive belief that the cultivation of high-technology clusters are the key avenue by which to ensure future economic prosperity, as one

account purports: "IT is the weapon of choice to ensure economic stability"

(McMurchie, 1999: 30). However, while such metaphors are poetic, they do little to convert non-believers.

Comprehending the need for hard data in this area, the Milken Institute undertook a research study to calibrate the increasing contribution of high-technology to the national and local economies of the United States. The report asserts:

Technology is having a pervasive influence on the spatial distribution of economic activity and, more importantly, the relative rate of growth among metropolitan areas within the United States. Prowess in technological innovation and assimilation will likely determine the relative success of nations in the future; it already is having profound impacts on the regional economic landscape of the United States. Ironically, just when globalization seemed to be forcing convergence among national economies and cheap, versatile communications seemed to be undermining the inherent advantages of doing business in one place rather than another, localities are emerging as important factors to the economic success of individual nations. Perhaps the best indicator of the ascendance of regionalism is that policy makers from Kuala Lumpur to Jerusalem are busy trying to clone Silicon Valley. Geographic clustering is becoming central to the creation and understanding of what economists call "comparative advantage" in trade - even in an information economy (DeVol, 1999: 3).

The increasing centrality of geographic clustering has led many neo-liberal advocates to claim that a new mode of capitalism has emerged, *alliance capitalism*: the co-existence of competition, sharpened by globalization and

liberalisation, with an increasing number of networked relations and strategic alliances (Heath, 1999; Roelandt and Hertog, 1999; Kotabe & Swan, 1998). According to this position, increased interdependence, the emergence of global markets and accelerated competition have created the conducive environment by which industrial clustering has become viewed as the key to innovation and economic growth. Ergo, *the new economic imperative*.

It is interesting to note, parenthetically, that both the neo-liberal perspective outlined here and the critical perspective illustrated in the opening chapter assert the emergence of a new mode of capitalism. However, whereas the neo-liberal approach employs the concept of networks and interdependence as the key concept to investigation, hence *alliance capitalism*, I use the concept of spatialization, thus *global capitalism*. Applying this different frame of reference, the focus of the study now shifts to the Canadian situation and examines the historical context from which the new economy discourse emerged.

III. Developing the Discourse: A Historical Perspective on the Emergence of the New Economy in Canada

To fully comprehend the processes of change currently underway, it is important to understand the historical context and wider social totality from which these changes have emerged and developed. The purpose of this chapter, therefore, is to briefly outline key transformations within the realm of international telecommunications between the early 1960s to the early 1990s, and examine the correlating Canadian response to these developments. This discussion is imperative as it demonstrates that today's dynamic environment *is not new*, but rather a product of history and therefore *a continuing trend of the past*.

International Telecommunications, 1960s - 1990: Decades of Change

The advent of the so-called new economy and/or global knowledge-based economy/society cannot be explained exclusively by technological advancements within the communication and transportation industries. Rather, they must be understood as being stimulated by political and economic forces which, since the 1960s, have effectively transformed the role of telecommunications, communications and information in society: from being understood and engaged as a national public utility to being conceived as a global commodity service. One important strategy employed to complete this transformation has been to alter the *discourse* used to engage these issues. Simply put, discussions on telecommunications, communications and information have been recast from a public service issue to essentially a trade

issue. By redefining the ways in which we discuss and engage the issue, one can redefine the way in which we comprehend the role of these industries and, subsequently, their function in society. The following is a snapshot of this process and focuses particularly on developments related to the International Telecommunications Union, the United Nations Educational, Scientific and Cultural Organization, and the development of the General Agreement on Tariffs and Trade. Although these areas are discussed separately, the historical development of each area is very much interrelated.

This snapshot begins in the 1960s, by tracing a number of developments related to the International Telecommunications Union (ITU) which, at the time, constituted the principal regulatory authority within the realm of international telecommunications. To this point in time, the ITU implemented a regulatory approach that stressed the symmetric provision of telecommunications services. The overarching goal of the ITU was to balance national sovereignty with interconnectivity (Drake, 1994: 138). To accomplish these policy objectives, the organizational structure was designed so that only national administrations could vote within the ITU. Hence, the ITU buttressed the nation-state as the principal actor within the realm of international telecommunications policy and, as such, this structure facilitated the preservation of state interests and cooperation

(Drake, 1994: 147).⁶ During the 1960s and 1970s, private industry pressure and technological advancements began to challenge the ITU framework.

The growing economic power of multinational corporations (MNC's) both cultivated and correlated with the 'need' for new telecommunications services, particularly private data networks between company branches and fixed suppliers and customers. A limited number of countries allowed for the establishment of private data networks within their domestic market,⁷ however, they were restricted from transcending across national borders. Thus, in the beginning, the majority of ITU members were resolved to upholding the public service mandate and prohibited the interconnection of private networks (Drake, 1994: 161).

Led by American MNC's, which constituted the majority of such companies, this tension intensified throughout the 1970s and into the early 1980s.⁸ The MNC's asserted that without interconnected private global networks they were unable to

⁶The ITU favoured and encouraged public monopolies but did not make this a condition of membership. Most members did prescribe to the national public monopoly structure. However, the United States, comparatively, had liberal domestic institutions and greater private control. Thus America did not fit in well with the structure of the ITU which resulted in an often tenuous and combative relationship. Nevertheless, the United State's participation was necessary because AT&T was emerging as the largest telecommunications provider and thus interconnectivity was dependent on American participation.

⁷The ITU held jurisdiction over international telecommunications and thus had no power to regulate over domestic markets.

⁸A key element in intensifying the tension was the world recession of the 1970s. This fuelled the push for economic restructuring (Giri, 1995: 195). While this falls outside of the limitation of this paper, it is imperative to note.

develop and exploit their international investments. This argument began to gain currency and, as a result, new interest configurations emerged, consisting of large telecommunications users and providers, computer equipment suppliers, and providers of information services (INTUG⁹ is paradigmatic of this) (Davies, 1994: 147; Drake, 1994). These new interest configurations began to apply pressure on industry regulators and, starting in the United States, MNC's began winning over national regulatory authorities. Thus, by the early 1980s, "[A]merican telecommunications policy accepted the view that the efficiency of the telecommunications system depended on competition" (Davies, 1994: 157). Influenced by the pressure, and following the lead of the United States, Britain and Japan began 're-regulating'¹⁰ their domestic markets as well. Thus began what Drake (1994) has termed "the process of asymmetrical deregulation".¹¹

The initial push towards deregulation by the United States was feverishly opposed within the ITU. However, beginning with Britain and Japan the call for deregulation would, incrementally, become global in scope. The eventual acceptance of the deregulation doctrine was directly related to the realization

⁹INTUG: International Telecommunications User Group.

¹⁰Re-regulation is used here purposely to counteract the mainstream term de-regulation (even though deregulation is used throughout this section). Deregulation is pejorative, inferring that the state is withdrawing from the regulation of markets. This is far from the truth and, in fact, in a 'deregulated marketplace' the state often plays a much more significant role. Thus it is the *nature* of the policy instrument that is changing and *not* simply the withdrawal of state. In sum, the policy instrument of market regulation is a *choice* implemented by governments, not a derivative of technological developments.

¹¹Asymmetrical deregulation is the unequal movement by nation-states towards a deregulated marketplace

that "protected and guaranteed telecommunications markets promoted inefficiency" (Davies, 1994). The inefficiency of European PTT's (Ministries of Post, Telegraph and Telephone companies) became evident when they compared themselves to American companies. European PTT's equipment costs were between sixty and one-hundred percent more than their American counterparts (Davies, 1994:150). In light of these stark economic differences, many countries began liberalizing their telecommunications environments in order to cultivate and maintain a globally competitive industry.¹²

During the same time period another transformation was occurring within the United Nations Educational, Scientific, & Cultural Organization (UNESCO). A debate erupted over the imbalance of international information and communication flows. The Non-Aligned Movement¹³ (NAM) challenged the dominant discourse of the free flow of information doctrine asserting that there needed to be a free and *balanced flow* of information. In turn, the NAM called for a New International Economic Order (NIEO) in 1973, which was supported and ratified by the United Nations (UN) General Assembly in 1974 (Mattelart, 1994: 180). As support grew for NIEO so did the NAM's demands for equitable

¹²While this was so for western developed countries, the situation of less developed countries was quite different. As Petrazzini (1995a; 1995b) and Dunn (1995) demonstrate, less developed countries were forced into deregulating their telecommunications environment in order to service their debt and/or in order to receive financial assistance from the World Bank and International Monetary Fund.

¹³The NAM is a consortium on nations that formed a union to battle the ideological pressures placed on them by US and the USSR during the Cold War. It was the intention of these countries to withstand ideological pressures in order to develop autonomously.

treatment within international community. Thus, in 1976, the NAM called for a New World Information Order (NWIO) (soon known as NWICO - the New World Information and Communication Order), to supplement their call for a NIEO. The NWICO debate was also supported by the majority of UN members and ratified by the General Assembly in 1978 (Mattelart, 1994: 181).

The call for NWICO, however, was vehemently opposed by the United States. The Americans viewed the call for NWICO as a direct threat to freedom of speech, freedom of the press, and to the free flow of information. Nevertheless, by 1984-85, momentum favoured the NAM and its call for a NWICO. Consequently, the United States, followed by Britain, withdrew from UNESCO. The combined contributions of the United States and Britain constituted thirty percent of UNESCO's operating budget and, as such, their withdrawal crippled UNESCO's influence and undermined its legitimacy (Hamelink, 1994: 202).

The United States condemned the 'politicization' of international institutions such as the ITU and UNESCO. In turn, the United States Senate Report, *Range Goals in International Telecommunications & Information* (1987), recommended "that Washington remedy the situation by assuring efficient nonpolitical international expansion, and nondiscriminatory access to international telecommunications facilities and networks" (Mattelart, 1994: 184). The Senate Report concluded that "only the principles of the free flow of information and competition on the open market could guarantee the protection of *everyone's*

*interests*¹⁴ (my emphasis)" (Mattelart, 1994: 144). In an attempt to operationalize the free flow of information doctrine and open market competition, the United States introduced telecommunications into the Uruguay Round negotiations (1986) of the General Agreement on Tariffs and Trade (GATT). The GATT was eventually passed by the United States Congress in 1994, and ratified by some 123 countries. Subsequently, under the World Trade Organization (WTO), the administrative body established in light of the GATT, on February 15, 1997, 69 governments representing over 90% of the global telecommunications services market consented to *the Agreement on Basic Telecommunications*, under the General Agreement on Trade in Services (GATS); and on March 26, 1997, 39 governments representing 92% of global trade in information technology products (worth over US\$500-billion annually), signed the *Information Technology Agreement*, under the GATT (DFAIT, 1997; Drake & Noam, 1997; Henderson & Nott, 1997; Tuthill, 1997; Senunas, 1997).

It is important to point out that the United States, while espousing the noble intention of striving to make this issue non-political, were exerting a very powerful political agenda: defining how the international telecommunications would be regulated. In short, through the word smithing of its rhetoric, the United States were able to obfuscate the fact that any government action employed to develop

¹⁴While noble in its intentions, the question begs: *who is everyone in this scenario?* From the viewpoint presented here, *everyone* corresponds to quite a select and limited group of people, American MNCs.

an economic agreement is, by definition, a political act. Winseck (1997) has described this as the transnational process of limited democracy, in which American-based legal systems are externalized internationally to increase the economic value of information.

Taken together, the developments in the ITU, UNESCO and the GATT represent a consequential pivot in the historic trajectory of international telecommunications policy in that the responsibility of regulating international telecommunications networks has moved from political and technical institutions (UNESCO and the ITU) to a predominantly economic agreement (GATT) (Mattelart, 1994: 185). The transition signals a conceptual shift with respect to the comprehension and treatment of telecommunications services: from a national public service/utility to the nervous system and catalyst for a full range of global pay-per services. Such a transformation, therefore, alters the ways in which one comprehends, approaches, engages, regulates and views the role of telecommunications in society.

Furthermore, this transition fundamentally alters structural conceptions of space *on the economic level*. The opening of world markets in telecommunications, communications, and information services transforms the economic geography of these industries, thereby unleashing the possibility for exponential economic growth for large telecommunications providers, computer equipment suppliers, and providers of information services. Ergo, it is this potential, the possibility to

generate enormous global revenues, that has spawned the discourse of the emergence of the global *new* or *knowledge-based* global economy.

It is political and economic international developments such as these that foreground what many have been quick to label the *communications/information revolution* and/or the *emergence of the new economy*. Therefore, today's dynamic environment is not merely the evolution or manifestation of new technological developments but also the result of historical political and economic struggles. Thus there is a rich political and economic milieu that has augmented the introduction of new technologies which, in turn, has acted as a key factor in shaping the emergence of the new economy at both the international *and national* levels.

Domestic Response: Canada and the Formation of the New Economy Discourse

During the same time period, there were correlating transformations within the spheres of telecommunications, communications and information occurring at the domestic level. These transformations represent, in part, a national response to the developments in the realm of international telecommunications as discussed above and, in part, a response to wider changes occurring within the Post-WWII North American economy.

The focus of the following discussion is to delineate this shifting trajectory in

Canadian telecommunications, communications and information policy and *policy discourse* in the Post-WWII era (roughly the late 1950s to early 1990s). I argue that the driving force behind this shifting trajectory has been the accelerating interrelationship between Canadian telecommunications, communications and information (ICTs from herein) policies and industries with that of science and technology policies. This growing interrelationship has resulted in ICT policies becoming a key dimension of Canadian industrial policy and therefore increasingly focussing on the goals of industrial expansion and global proliferation rather than on other traditional social policy goals such as universal access and the development of domestic content.

Since the late 1950s, one can trace the evolution of the technological nationalist policy framework that is predominant today.¹⁵ As the following argument proffers, with the rise of computers, databases and informatics, the Canadian government has increasingly embraced a technologically determinist position that focuses on the technological imperative which, primarily, has been articulated through the discourse of the emergence of the information economy

¹⁵Generally, *technological nationalism* is a policy position employed by the federal government built upon the belief that constructing the technological infrastructure is the primary issue, after which the natural result will be the development of national ICT industries and thus a national culture/identity. This approach constituted Canada's first policy framework, as it was based on the belief that Canada needed to establish stronger east-west transportation and (tele)communication lines in order to counterbalance the stronger north-south pull of continentalism (see Martin, 1991 & Babe, 1990, for example). This singular focus on building technological capacity failed in that the space created by this technology was filled with foreign content. Hence *cultural nationalism* is the policy framework employed to fill the 'cultural void' created by the technological nationalist framework. The core assumption underlying the cultural nationalist position is that there is a substantive difference between Canadian and American cultural products and, moreover, that these products contribute to social goals that fall outside the realm of economic relations. The cultural nationalist position dates back to the 1920s and peaked in the 1960s.

and/or computerised society. As such, the current dominant discourse surrounding the Internet as the foundation of the new economy is not a new phenomenon that emerged in the 1990s, but rather the product of decades of struggle, failure and refinement. The end result of this process has been the development and full-fledged acceptance of a new economic discourse (which is the focus of chapter 4). As is illustrated here, however, this discourse was not initiated simply by the development of new technologies, but rather it was also driven by political and economic goals.

The starting point or the root of the current policy shift, and thus the focus of the following discussion, dates back to formative changes during the Post-WWII era within the realm of science and technology policy. The ascendance of science and technology as the key driver of economic growth in the Post-WWII era, and the process of science and technology policy coming to encompass ICT policy, initiated the shift of ICT policies and industries to becoming the core dimension of Canadian *industrial policy*.

Science and Technology Policy in the Post-War Era

Traditionally, science has shared a conceptual affinity with art and culture in that these spheres of action have been bracketed off from the logic of the market so that they could develop in a more autonomous fashion. With respect to science, this has meant that there was a distinct demarcation between science and technology. The division was “meant to protect science from its implication in the

matrix of economic and political considerations, which are generally recognized to influence - if not determine - the course of technological development and its dispersion (Aronowitz, 1988: 6). In the Post-WWII era, however, this demarcation has weakened and thus the lines which have historically delineated science from technology and economy, have become increasingly opaque.

This process was initiated by developments in the United States, as it was the American economy that experienced explosive growth in the Post-WWII era, ascending to the position of global leadership. It is therefore important to briefly sketch out the broad changes within the American context in order to fully understand the correlating changes that have taken place in Canada. This is so much more important from the Canadian perspective as, historically, the Canadian economy has been closely linked to the American economy due to proximity (the two countries share a border) and geography (in many cases it is easier to trade north-south than east-west).

Science and Technology in Post-WWII America

Seymour Melman (1970) has documented many of the issues that have emerged regarding the changing nature and role of science and technology in the United States during the Post-WWII era. Melman acutely acknowledges the imperative and changing role of the government in that:

In its beginning, the government of the United States was a political entity. The managing of economic and industrial activity was to be the province of private persons. This division of function was the grand

design for American government and society, within which personal and political freedom could flourish alongside (that) of rapid economic growth and technological progress. After 1960, this design was transformed (1970: 4).

Melman convincingly illustrates how the American military-industrial complex emerged through increasing government involvement within the spheres of research and development and industrial production. "[T]hereby," Melman concludes "the federal government does not "serve" business or "regulate" business. For the new management is the largest of them all. Government *is* business. This is state capitalism" (1970: 2).

Stanley Aronowitz (1988: 5), in a similar intellectual context, asserts that the development of the American military-industrial complex provides the rationale for why certain technologies have become privileged during the Post-WWII era. Through massive government investments and shifts regarding the allocation of resources (i.e. a specialized, focussed and trained workforce [eg. Engineers]), certain technologies and even particular spheres of science have come to predominate over others. Evidence of this shift can be found in the drastic increase of the Department of Defence's annual budget from \$45 billion in 1960 to \$83 billion by 1970 (Melman, 1970: 19), resulting in massive R&D programs such as the Space Program. This is a considerable increase considering that, at the time, America's entire GDP was roughly \$900 billion. Thus in 1970, the budget of the Department of Defence constituted approximately ten percent of the US's total GDP. Moreover, comparatively speaking, the Department of

Defence's budget was considerably larger than some western industrialized countries' *entire GDP*: Belgium \$18.1 billion; Italy 61.4 billion; Sweden 21.3 billion (Melman, 1970: 22).

Hence the development of the American military-industrial complex, in effect, *institutionalized* a war economy in the United States with its focus on the development and deployment of technology. It was at once both a stimulus and an excuse for the allocation of tremendous resources. Thus after WWII the American economy never reverted back to a civilian economy (although many of the products and services that flooded the post-war economy flowed from such research), but rather the government continued to play a pivotal role in industrial and technological production through research and development conducted under the auspices of the Department of Defence.

Therefore, in the Post-WWII era, the American economy has been driven via the harnessing of science within the industrial sphere. As a result, the process and structure of undertaking scientific research has changed and become increasingly commodified and market oriented. Science has become caught up in the 'matrix of economic and political considerations that influence - if not determine - technological development' (Aronowitz, 1988).

Science and Technology Policy in Canada

While one would be hard pressed to argue that Canada has developed its own military-industrial complex on par with that of the United States, one could argue that the institutionalization of the war economy in America has had certain impacts and/or sparked correlational developments within Canada. In fact, this is what Hayes (1973) argues. In reference to the Canadian experience, he states: "the science-government linkage developed because the war (WWII) had demonstrated that it was in the national interest for science and technology to thrive" (1973: 3).

As such, the Canadian government has set out to construct a national science policy framework in the attempt to 'harness' this traditionally 'autonomous' sphere. According to Hayes, the use of the term 'science policy' is almost deceptive here as, in reality, what the government is truly interested in is industrial technology (1973: 70). One of the first manifestations of this new framework for industrial technological development was the introduction of research and development tax credits in 1949 (Heath, 1999: 180).

However, the pivot on which Canadian science policy turned was the Glassco Royal Commission on Government Organization which reported in 1963. Its mandate was to propose measures to increase "the efficiency and economy in all government departments" (Hayes, 1973: 45). The result of the Glassco Commission was the implementation of a new institutional framework for science

research in Canada. This, according to Hayes, represents a disjuncture in Canadian science policy for, historically, scientific research applied a free-enterprise or competition approach which allowed the creative dynamics of science to flourish. In juxtaposition to this, the science policy implemented after the Glassco Commission sought to structure, organize and direct scientific research towards particular technological developments.

The undertaking of scientific research, therefore, has come to depend more on financial considerations than on scientific merit, meaning that the government has become increasingly central in determining the priorities of scientific research. Recognizing these developments, Hayes (1973: 20) proffers, “for the past half century it has been the policy of the federal government in its own laboratories to harness science into the economic system. Currently the policy is seen to be extending to industry and universities.”

In sum, science and technology have come to be viewed as imperative to economic growth. The result of this process has been the increasing centralization and institutionalization of scientific research within the state apparatus. Consequently, “the process of scientific discovery has been permanently removed from anything resembling an autonomous sphere” (Aronowitz, 1988: 20). This is especially true in relation to the development of ICTs which, as outlined in the first two chapters, are viewed as the core industrial sector of the new economy, and the key driver in facilitating economic expansion

as they provide and/or constitute the networks and media through which 'global' business is increasingly conducted. As argued below, the harnessing of science for industrial development and the ascendance of the ICT industries to the position of the key lever in economic growth represents the initial spark that has since fuelled the reversion of Canadian ICT policy back towards a technological nationalist framework. Furthermore, as elucidated in the next chapter, this spark has also fuelled the fire that now rages with respect to the new economy discourse.

Integrating Science, ICT Policy & Industry

Thus in the Post-WWII era, science and technology have become viewed as the key sources of economic growth and therefore have been centralized within the state apparatus. In addition to the aforementioned changes within the realm of science and technology, however, science policy has also gravitated towards, and in fact has become integrated with, ICT policy. The integration of these two spheres, under the broader rubric of industrial policy and, more specifically, to the forefront of policies aimed at economic growth, has been central in developing the discourse of the new economy in Canada. The evolution of this interrelationship can be traced most clearly through the work of the Department of Communications (DoC) and the Science Council of Canada during the 1970s and 1980s.

Developing the Discourse of the New Economy

A pertinent starting point for this discussion is 1969, when the Minister of the DoC set up a series of studies which have become known as the *Telecommission*. The general report produced from these studies, *Instant World*, summed up the thrust of the findings of the *Telecommission* in an archetypal fashion, stating that we were entering the post-industrial or information economy and, as a result, Canada was on the precipice of wide-ranging social, economic, political, and cultural changes. The concept of the 'information economy' has since ascended to a hegemonic position within Canadian policy discourse.

It is important to recognize that the DoC and the Science Council, two distinct government entities with disparate mandates, came to adopt not only the same discourse but also the same vision concerning the development of the 'information economy'. Like the DoC, the Science Council also recognized the increasing importance of the computer and microelectronics industries in some of its earliest reports (Report 4 & 13). However, it is the March 1982 report, *Planning Now for an Information Society: Tomorrow is too late*, that foremost articulates the discourse and depicts the intermeshing of ICT and science policy objectives, as it fully accepts and asserts the idea of the information revolution: "[T]he modern industrial state is a complex held together by information. Indeed, we live in what has come to be known as an 'information economy'" (1982: 11).

This becomes a predominant theme in the work of the Science Council and thus, in subsequent reports, the Council asserts “[I]n such an economy technological innovation in both service industries and goods-producing industries is more than ever the key to improving economic performance” (Science Council, 1988: 5).

Indistinguishable from the findings of the Science Council, the DoC’s Consultative Committee on the Implications of Telecommunications for Canadian Sovereignty (1979: 1) (Clyne Report) states that “telecommunications . . . will form the infrastructure of the new industrial society that is now coming into being around the world . . . it is not too much to say that its birth is an event equal in importance to the Industrial Revolution . . .” Similarly, two DoC-based researchers, Serifini and Andrieu (1981: 13), proclaimed that:

the information revolution is a worldwide phenomenon causing significant structural changes in the economies of all countries, regardless of national differences in institutional arrangements or public policies. This strongly suggests that, *like the industrial revolution, the information revolution is unavoidable. Consequently, the objectives of public policy should be not to prevent the revolution from occurring, but rather to turn it into our advantage* (emphasis in original).

In understanding the communications environment this way, both the Science Council and the DoC concluded that there was the need for a new ICT policy. The rationale for the Science Council was to ensure that no “confusion (would) lead to wasted resources, and loss of time in the world race to develop networks . . .” (Science Council, 1982: 53). Similarly, in the view of the DoC, “Canada has no choice but to promote vigorously (the) introduction of new technologies in

order to maintain and increase its international competitiveness" (Serifini & Andrieu, 1981: 96). As such, by the late 1970s and early 1980s the DoC and the Science Council were actively solidifying the new economy discourse that influences much of Canada's current policy discussions.

In sum, to avoid endless quotations, as is done in many studies (see Babe, 1990: 9-14), it suffices to say, that throughout the 1970s and 1980s, the spheres of Canadian communication and science policy gravitated towards each other and, as illustrated above, became intermeshed underneath the broader rubric of industrial policy. Technology research and the promotion and development of the ICT industries were viewed as the key elements in preparing Canada for the emergence of the information economy. Therefore, with the introduction of the concept of 'an emerging information economy', the focus and objectives of both policy spheres became similar: the development and exploitation of new technologies. This discourse experienced a serious hiccup during the initial attempt at implementing this technology driven vision of Canadian society. This hiccup was in the form of TELIDON, the 'first-take' at implementing a new economy/information economy in Canada

The New Economy 'Take-One': The Failure of TELIDON

Gillies (1990: 1) succinctly outlines how between August 1978 and March 1985, the period of TELIDON's public life, TELIDON accentuated "the notion of technological determinism as popularly used by government and industry to

generate acceptance of and demand for innovation and its products."

TELIDON represents an important nodal point in the development of the new economy discourse in Canada, and thus deserves a brief discussion. It illustrates most clearly that the inherent evolution of technology is but one factor among many necessary to transform society. There are wider social, cultural, political and economic features that, if not present and/or resistant, can challenge, retard and resist the 'technological imperative'.

TELIDON: the Technology

TELIDON consisted of two primary technologies: videotex and teletext:

Videotex is an interactive closed-circuit system which allows the user to select, in (their) home, office, school, or other site, a "page", i.e., a full television screen, of information stored in central computerized data banks. This choice and the information chosen each flow through the switched telephone network.

Teletext is a one-way transmission system broadcast as a television signal using an invisible unused portion of existing television signals - the Vertical Banking Interval ... Videotex and teletext may have a common data base or separate data bases. In both cases the kinds of information available are quite varied - popular, journalistic, professional, academic, business-directed, commercial, statistical, personal - and may include confidential data accessible only to designed "closed user groups," e.g., doctors, lawyers, social workers, banks" (Gillies, 1990: 4).

TELIDON technology was publicised pervasively and expectations surrounding its potential were very high in business, academia and especially within government. The media took part as well, and were in "full technocratic cry" (Gillies, 1990: 6). Epitomizing such expectations, Godfrey and Chang (1981: 1),

in their work *The TELIDON Book*, assert:

As a social phenomenon ... TELIDON represents something of quite enormous complexity and impact. From a publicity point of view, *it is undeniable that TELIDON has been the right product at the right time.* Seldom has a product of this complexity moved so quickly from the lab into the marketplace...

TELIDON came along as a new product just at the that point [sic] when the public was beginning to become aware of the telematics revolution, that combination of electronic communications and inexpensive computing power which is changing the way we play, learn and work (my emphasis) .

If one substitutes the word "Internet" or 'e-commerce' for 'TELIDON' in the above passage, one would think that one is reading the popular press, a recently issued government document or a corporation's yearly economic forecast!

***The Pervasive Acceptance of TELIDON Within Canadian Society:
Witnessing the Technological Imperative***

The federal government fully embraced TELIDON technology as a key element in the 'telematics revolution'. Douglas Parkhill, then Assistant Deputy Minister of Research at the DoC, expressed this sentiment succinctly, asserting that the fundamental policy question is, "how can Canada best exploit the computer utility concept to make the potentially revolutionary benefits available to the entire public ..." (Godfrey & Chang, 1981: 30). Moreover, the Canadian Videotex Consultative Committee estimated that there would be 500,000 terminals in use, consumer expenditures of C\$100 Million and business expenditures of C\$1 Billion, by December 1985 (Godfrey & Chang, 1981: 91). Clearly, the federal government perceived TELIDON as the technology that would drive the new

economy/telematics revolution in Canada.

The federal government was not alone in its vision, however. The private sector also held this vision. In fact, the ICT industries themselves also fully embraced the belief in the revolutionary impact of TELIDON. So much so, in fact, that the cable companies and teleco's battled for the right of delivering the service (Godfrey & Chang, 1981: 46). In their account of TELIDON, Godfrey & Chang (1981) interview a number of leading business persons in the ICT field. One of which is Jack Fraser, Assistant Vice President, Business Development at Bell Canada, who proclaimed, "[T]here's lots of room for everybody (referring to other technologies), but TELIDON is the best technology and the best ones usually win" (1981: 84). Echoing this sentiment, Glover Anderson, Assistant General Manager, Manitoba Telephone System, asserted, "TELIDON is clearly a superior product ... [T]he AT&T endorsement of TELIDON was obviously a very positive consideration" (1981: 87-89). Therefore, in addition to the primary federal government department responsible for the ICT sector, the major players within the ICT sector themselves supported and strived for the development of TELIDON as the transformative technology that would propel Canada into the information economy. As such, the political and economic champions that one would expect to be able to assert such a vision were unable to do so, as TELIDON went down in history as a failure, popularly described in retrospect as "a solution looking for a problem" or "a technology looking for a market" (Gilles, 1990: 6).

The failure of TELIDON most clearly demonstrates the limits of assessing technology as the key driver of change within society and underscores the imperative function of the social and cultural dimension in addition to the political and economic. For the same technology was extremely successful in France and Germany, two countries that had different socio-cultural and political-economic conditions. The failure of TELIDON, however, was quickly dispelled from corporate memory and, as is discussed in the following chapter, did little to slow down the march of the development and ascendance of the information economy/new economy discourse in Canada.

Developing the Discourse, A Historical Perspective: Conclusion

In sum, state intervention in the form of the institutionalization of the war economy, the subsequent transformation of science and technology policy in the Post-WWII era and the increasing interrelated relationship between ICT and science policy has, effectively, dismantled the cultural nationalist policy framework and initiated the reconstruction of technological nationalism in Canada - towards the goal of the information economy. Dowler (1996: 341) correctly points out, as Woodrow et. al. (1980: 65) noted a decade and a half earlier:

by the late 1970's this transformation was already evident in the ministries directly related to culture. (Thus) the department [of communication] is coming to be perceived more as a science-based unit promoting an increasingly important aspect of Canada's overall industrial strategy and less as a culture-oriented unit responsible for managing the instruments whereby Canadian identity is shaped.

The merging of policy goals between the Science Council of Canada and the Department of Communications can be viewed as forming the foundation upon which the new economy discourse was founded in Canada. Even the failure of TELIDON, which demonstrated some substantial weaknesses inherent in the technological utopian vision, could not halt the unrelenting, forward looking vision, influenced by the technological imperative and technological sublime. And it is this increasingly powerful, institutionalized vision that, in effect, has set the parameters of the current policy discourse regarding the Internet and ICT sector in Canada. The position articulated in these policy documents and research papers, and which was consciously implemented in the form of TELIDON, presents a particular vision of the future of Canadian society and economy: one that is driven by the evolution and implementation of technology. Taylor (1988: 71), in an insightful and emotional assessment of this position, states that this vision does not entail a comprehensive discourse that fully considers all the relevant and important dimensions associated with such a position or argument, instead:

[I]t is a picture in which only the positive is accentuated. Whenever quite real and possible negative human and social effects of the computerization of communications are concerned, there is a deafening silence. The end-result of such unrelenting optimism is to make the paper [Communications For the Twenty-First Century] read as if it had been put out by the PR department of a large technology firm - a curious position for the Department of Communications in a nation with such a weak electronics and software manufacturing industry to protect. The sociological dimension is not simply underplayed; it is absent ... The result is a distortion in perspective - a distortion which comes from ignoring the inevitable impact of change in a society where there are already discrepancies: regional, occupational, ethnic, sexual, educational, which, cumulatively, mean unequal opportunity to benefit from innovation when it comes. To ignore these discrepancies is to create a trap for

oneself: which translates into indiscriminate technology push.

This astute commentary on the development of the policy discourse surrounding the emergence of the information economy in Canada begins to highlight some of the predominate assumptions upon which Canada has based its approach to the development of the new economy, an area that is dealt with in depth in the following chapter.

IV. Establishing the Dominant Discourse: Technological Nationalism - From the Information Highway to the Internet, and Beyond

For most researchers and policy makers, the importance of science and technology to industrial development is unchallenged - the focus of the last half of the 20th century has been to understand the process of technological progress and industrial development, the better to manage it. Science and technology is an activity embedded in a complex system. In coming to grips [sic] with this, the discussion has shifted from science and technology to "innovation" and to "systems of innovation" (J. A. D. Holbrook & L. P. Hughes, 1997: 1).

With respect to the quote above, the preceding chapter illustrated how the discourse surrounding new economy emerged in Canada - thereby 'coming to grips' with the complex system in which science and technology are embedded. This development was due, in large part, to substantial changes within the realm of international telecommunications, as well as to the integration of science and technology policies and ICT policies under the broader rubric of industrial policy on the domestic front. This discussion was necessary to illuminate some of the pivotal assumptions upon which the new economy discourse in Canada rests.

The present chapter is concerned with 'the shift in the discussion from science and technology to innovation and systems of innovation'. Therefore, the following discussion fleshes out the core assumptions that have come to constitute the dominant discourse surrounding the new economy, and investigates the ways in which this discourse has been refined and implemented.

My contention is that the discourse of the new economy became entrenched in government policy with the formation of the Information Highway Advisory Council (IHAC) and with the tabling of its reports. The subsequent work of the government since the tabling of the IHAC reports, specifically in the areas of e-commerce and e-business, represents how the new economy discourse has been refined and is being implemented.

Establishing the Dominant Discourse

The reversion to a technical nationalist position (see footnote 16) has led to the development of a policy framework based on four core assumptions. These assumptions form the epistemological basis from which the government has structured its discourse concerning the development of science and technology and the construction of the Information Highway, a concept which has since been refined to the 'Internet' and, even more so, to specific applications such as e-commerce - all of which represent the embodiment of the communication revolution and are the symbols of the information economy. The four core assumptions are: the revolution or disjuncture thesis; the new global-knowledge-based economy thesis; the global race thesis; and, the belief in information technology as the engine of social change thesis.

The premise of the *revolution or disjuncture thesis* is that, due to technological developments, Canada as a society is in the midst of a transformation or on the

verge of entering a new and different realm of economic, social and cultural development. This assumption is forcefully asserted in the literature produced by Industry Canada. For instance, a recent document discussing the development of science and technology in Canada purports: “[T]here can be no doubt that our economy is undergoing a major transformation, *unlike any since the Industrial Revolution*” (my emphasis) (Canada, 1996a: 2). Similarly, the IHAC begins its final report *Preparing Canada for the Digital World*, by stating that “[a] social, economic, and cultural revolution is now transforming the world, a new game is starting, and the older rules no longer apply” (IHAC, 1997: 1).

By framing its discourse in this way, Industry Canada presents the idea of the information economy as a natural and inevitable evolutionary progression. Industry Canada, therefore, imbues its position with the essence of a teleological doctrine. Henceforth, the first core assumption used to build the new economy policy apparatus is that we are moving towards an information economy and this evolution is at once both a favourable progression and a distinct break from the past.

The revolution or disjuncture thesis runs parallel with the assertion of *the emergence of a new global knowledge-based economy thesis*. The dissolution of economic boundaries and the rise of the knowledge and information industries represent the central dimensions of the information economy. Forecasting such

developments the IHAC states: “[I]n a global economy based on exploiting information, the capacity to innovate will be an essential source of comparative advantage. Prosperity will depend on a country’s ability to apply technology creatively in devising new and consumer-valued information products and services (IHAC, 1997: 3). The IHAC goes as far as to assert that “[t]he creation, manipulation and sharing of information and knowledge will become an overriding human imperative” (IHAC, 1997: 2).

The economic transformation to a global knowledge-based economy has led to the rise of a particular set of industries, ‘high-technology’ industries that, according to Industry Canada, delineates the quickly approaching horizon of the information economy. It is important to note here that these industries stem largely from research and development performed by private companies via the investments made by government into the war economy during the post-war era. The high-technology industries are consistently divided into four categories: environmental technologies; enabling technologies (which include applications of information technology [i.e. multimedia], bio-technology, advanced manufacturing, and advanced materials); and aerospace and defence (Industry Canada, 1998a; 1998b: 9). In general then, when the Government of Canada discusses the emergence of the information or high-technology economy, these are the primary industries of which it speaks.

The global race thesis is an interesting and essential core assumption in the

literature of the federal government. For it is this core assumption that provides the inspiration or motivation to conform to and strive towards the vision set out in the first two assumptions. The motivation, however, comes in the form of a threat: “[C]anada’s approach to the global knowledge-based economy must recognize that *we are in a global race* where countries need strategies now for the 21st century knowledge-based economy” (my emphasis) (Industry Canada, 1998b: 2). While the literature repeatedly states that Canada is well positioned in the global race (Industry Canada, 1998a; 1998b 1; 1995a: 1; IHAC, 1997: 3-4), there are constant reminders that “the list of possibilities is long, and the promise is real - *provided that everyone can respond wisely and quickly to the new realities*” (my emphasis) (IHAC 1997: 2).

Motivation by threat, in the form of the global race thesis, establishes an end-rationality in that Canada’s survival is viewed as being dependent upon emerging as a world leader in the transition to the global knowledge-based economy. This infers that the means by which Canada achieves this goal is less important than the overall objective.

The final core assumption is *the belief that technology is the engine of social change thesis*. The first IHAC report (1995: vii, ix) begins with this statement: “[I]nformation technology is changing our world. It is reshaping our economy and affecting the life and work of almost every Canadian”, and later asserts “we

are in the midst of a technological revolution that will transform our individual lives and our entire society." This assumption is also pronounced in the IHAC's final report (1997: 1) where again, in the introduction, the Council asserts that they "see information and communication technologies as key agents in the far-reaching changes that are overtaking every society on earth as the world enters the new millennium."

By structuring its discourse around these four core assumptions the IHAC, Industry Canada and, ultimately, the federal government, in effect, limit the range and possibilities that communication policies and initiatives can take. These assumptions constitute the 'lens' through which the Canadian government now views and constructs ICT policy. Consequently, the goals and objectives of ICT policies have become increasingly related to the financial success of Canadian telecommunications, communications and information companies for, as the four core assumptions infer: a country must either innovate and lead or remain stagnant and become subservient to the rising tide of the global economy.

Refining & Implementing the Discourse: Electronic Commerce, the Killer Application - E-Business, the Way of the Future

Following the completion of its final Report in 1997, the work of the IHAC became institutionalized within the federal government, largely in the Spectrum, Information Technology and Telecommunications (SITT) Sector of Industry Canada. Under the banner of the Connecting Canadians agenda, a six pillar

strategy aimed at leading Canada into the new economy (see figure 6), Industry Canada, as well as the federal government as a whole, has and continues to work vigilantly to implement the discourse entrenched during the IHAC process. For example, as self-described by Industry Canada: "Connecting Canadians is the federal government's vision and plan to make Canada the most connected country in the world. In an increasingly competitive and knowledge-based global economy, Canada can benefit by becoming a world leader in the development and use of advanced information and communications technologies (Industry Canada, 1999).

While each of these pillars deserves critical attention, I am primarily concerned with the electronic commerce pillar, as it is this application of the information highway/Internet that has come to be viewed as the *killer application* which drives investment, innovation and wide-spread acceptance throughout society and the economy.

The following discussion relates the importance of electronic commerce to the development of systems of innovation and geographic clusters, especially with respect to the ICT industries. Indeed, even though the issue of electronic commerce is currently under-theorized and in need of examination across a range of disciplines, the point here is to merely engage electronic commerce in broad terms and in relation to the topic at hand. Nevertheless, as the following discussion indicates, these two issues are very much interrelated.

FIGURE 6

A Six Part Agenda to Prepare Canadians...

...for the Knowledge-Based Economy & Society

Source: Industry Canada 1998

From E-commerce to E-business: The New Economic Imperative in Canada

Electronic commerce, broadly understood, "includes all transactions using electronic means" (Canada, 1998: 1). According to this definition then, transactions need not be purely monetary, they can also be informational, as long as they are key to the functioning of business processes. Therefore, electronic commerce is vastly more complex and far-reaching than simply purchasing consumer goods over the Internet, as many popular/journalist accounts prescribe. Rather, the real potential of electronic commerce lies with its implementation within individual businesses and in business-to-business (B2B) relationships. In fact, current and future estimates of global electronic commerce revenues assert that B2B e-commerce does and will continue to account for between 80% to 90% of all e-commerce (OECD, 1998; 2000; Canadian E-Business Opportunities Roundtable, 2000).

The OECD (1998: 11-13) succinctly outlines the rationale for electronic commerce emerging as the killer application of the Internet, stating:

E-commerce over the Internet exploits a group of technologies - information and communications technologies (ICTs), software that links ICTs into a network...and relatively easy to use, universal, graphical interfaces... - with a broad appeal, commerce...

...[e]lectronic commerce is playing a catalytic role in organizational change by opening up the possibility of new models for organising production and transacting business, thereby forcing existing firms to re-examine their cost structure and competitive strategies...

The Internet opens up certain proprietary relationships, extends relations between sectors, makes the electronic market accessible to smaller businesses and allows them to address international markets. The nature of competition as well as the firms' strategies and competitive

advantages in domestic and international markets also change.

Therefore, electronic commerce involves deploying, using and embedding ICT products and services into business processes across sectors and across borders. This process results in discernable shifts in the geography and space of economies. It allows businesses to bifurcate aspects of their production process and rearticulate them across the globe while still maintaining real-time communications with staff, machines, suppliers and customers. It is capital's ability to overcome the constraint of time and space in this way that has facilitated capital in acquiring more power with respect to its relationship with the state. Moreover, electronic commerce breaks down traditional barriers to market entry for small- and medium-sized businesses in many industries, thereby allowing them to gain access to global markets. As the OECD purports, electronic commerce "shrinks the economic distance between producers and consumers...In general, electronic commerce succeeds in moving economic activity closer to some of the ideals of perfect information: low transaction costs, low barriers to entry, and improved access of information for the consumer" (OECD 1997: 3).

Canada is currently a world leader in electronic commerce and has done much in the way of fostering a conducive environment for its development. Canada released its electronic commerce strategy in September 1998, hosted the first OECD Ministerial on Electronic Commerce in October 1998 (in which Canada

played a central role in defining the agenda that now constitutes the international agenda) and, most recently, passed legislation on privacy and 'technology neutrality'¹⁶ with respect to electronic transactions. Therefore, Canada comes from a point of strength with respect to electronic commerce, not a reactionary or defensive position.

In an attempt to strengthen this position and to facilitate the deployment and use of electronic commerce throughout the Canadian economy, Industry Canada and the Boston Consulting Group (a international strategy and general management consulting firm) initiated *The Canadian E-Business Opportunities Roundtable*. This roundtable, led by industry and supported by the federal government, is designed to mobilize the private sector by increasing awareness and accelerating the deployment of electronic commerce technologies and services to Canadian businesses. The key members of the roundtable are the elite of Canada's ICT sector: John Roth, CEO Nortel Networks; David Pecault, Head of E-commerce and VP Canada, Boston Consulting Group; John Wetmore, President & CEO, IBM Canada; Gaylen Duncan, President and CEO of the Information Technology Association of Canada (ITAC); Peter Nicholson, Chief Strategy Officer, BCE Inc.; etc. The fact that this elite group of ICT industry executives has come together demonstrates both the importance placed on this

¹⁶Sections 2-5 of *The Protection of Personal Information and Electronic Documents Act*, which received Royal Assent on April 13 2000, provides for the functional equivalence of electronic documents, records and signatures, thereby providing the legal basis for electronic business.

issue and the vigour with which industry is pursuing it. It also demonstrates the economy-centred perspective by which this issue is being engaged, a fatal issue with respect to the TELIDON experience.

The report of the roundtable, *Fast Forward: Accelerating Canada's Leadership in the Internet Economy* (2000), broadens the scope of 'e-commerce' by introducing a new, more encompassing term: 'e-business'. E-business, as figure 7 illustrates, entails the key elements of the ICT high-technology sector. Ergo, the attempt to foster and facilitate e-business clusters is, de facto, what I discussed in the opening chapters as an ICT cluster - *the core sector for high-technology development*.

In the report of the *E-Business Opportunities Roundtable*, there is a detailed framework for action identified to strengthen Canada's leadership in the Internet economy. Central to the success of this framework is the formation of e-business clusters. The roundtable takes the development of e-business clusters in the United States as its point of reference and asserts,

Most of the new e-business creation in the U.S. is occurring in specific regions where a set of key ingredients combine to fuel spectacular rates of new company formation. This new e-business formation is happening in clusters of activity in and around the cities that are traditional high-tech and media centres. The three most prominent clusters are found in the San Francisco Bay area (including Silicon Valley), New York City and Boston (2000: 23).

Thus while the buzzwords may differ - ICTs, e-commerce, e-business - the

FIGURE 7

The Scope of E-business

- (I) Leverages the Internet for providing or sharing information, or for delivering services
- (II) An e-business generates some or all of its revenues from Internet-based transactions or the manufacture and/or sale of Internet-related products and services

Source: Report of the Canadian E-business Opportunities Roundtable 2000

intention is the same: to create clusters of economic activity to stimulate innovation and globally competitive ICT firms.

A consequence of this strategy, however, is the increasing importance of governments to create a conducive environment for capital investment, especially foreign capital investment. This, in large part, revolves around providing the necessary requirements and proper incentives for businesses to invest. This brings us back to the discussion on the anatomy of clusters as discussed in chapter two.

In addition to the changing role of the state in this process, the geographic clustering of high-technology industries also transforms business strategies by altering the traditional incentives related to businesses establishing themselves in a particular location. Rather than situate themselves centrally, between their supplier and customer base, ICT high-technology businesses situate themselves where the most innovative action is and where there is a large pool of skilled workers - the core raw material in the *new* economy. In fact, as mentioned earlier, a recent report on United States Internet clusters found that 75% of Internet executives surveyed cited access to skilled-talent as a key factor in determining the location of their Internet companies (Joint Venture, 1999: 13). This shift in incentives for ICT businesses to establish themselves in a particular location and their ability to pick amongst a number of locations across the globe (i.e. leveraging their spatial mobility) is having demonstrable ramifications on the

policy levers governments use to attract business and promote economic growth.¹⁷

Up to this point, the discussion has centred on the national response, by both government and business, to these changing pressures, focussing on the federal strategy to accelerate the adoption and use of the information highway, the Internet, e-commerce and now e-business. While this is a key dimension of the equation, it is only part of it. As regions and cities become *the key driver of the global economy* (DeVol, 1999; EDE, 1999), in the form of 'poles' or 'nodal points' of high-technology development, there are subsequent impacts with respect to the role of local and regional governments. Local and regional governments must also respond to these changing pressures in order to attract the investment, talent and innovation necessary to be successful in the new economy. These changes and pressures, as argued in the following chapters with respect to the case study of Montreal, results in a transformation in governance at the local level.

The governance of regions and cities changes in that these areas increasingly concentrate on establishing the necessary requirements and on creating a conducive environment for the formation of high-technology clusters. This

¹⁷I should stress that I am focussing on the ICT sector here and the nature of the ICT sector may place greater emphasis of networked relationships within geographic clusters, whereas other industries place emphasis on vast spaces (i.e. manufacturing) or land (i.e. farming). Thus, it is viewed as essential for competitiveness in this sector.

results in capital acquiring more leverage in its relationship with the state. The role of the state is then reduced to enticing globally mobile capital to their particular location. With numerous locations within a particular country and hundreds of such sites globally, regions and locations are under tremendous pressure to produce an amenable environment for business, especially if they prescribe to the doctrine of the new economic imperative. This results in fierce regional competition for investment resulting in a situation, as described in a recent *Guardian Weekly* article, where investment is treated "as a Dutch auction in which local labour forces (and local states) bid - like whores - for the favours of mobile capital" (Elliot, 1999: 14). While the directness and explicit nature of the language is striking, its message is clear: globally mobile capital is becoming increasingly powerful in relation to the state and labour. The next three chapters focus on the case study of Montreal in relation to this process and examines some of the wider social, cultural, political and economic implications that are involved.

V. Applying the New Economic Imperative at the Provincial and Local Level: The Case of Quebec & Montreal

A new technological revolution is underway that will very likely have as much impact as the Industrial Revolution on our lives and productivity. The result of the development of new ways of processing and transmitting information and of communicating, the current revolution affects all aspects of our daily lives, opening the door to a welter of new possibilities. At the same time, it is radically changing the ways that all sectors of economic activity operate. It has allowed gains in productivity that explain the bulk of the extraordinary economic growth we are experiencing. It is now affecting the market economy, and the spectacular increase in e-commerce is its most recent and striking example.

*A modern society with an open and dynamic economy, Quebec must position itself as rapidly as possible in this environment where incredible changes are occurring. The extremely swift development of advanced-knowledge sectors and the success of high-tech firms stunningly illustrate the progress achieved in recent years in this direction. Quebec firms, **stimulated and supported by an unwavering government policy**, have recorded very encouraging results (my emphasis).*

*We should not, however, rest on our laurels. In particular, the generalization of the Internet and the proliferation of on-line transactions in our daily lives compel us to act quickly. Buttressed by an effective support strategy, the Quebec economy has resolutely begun the necessary transformation towards the new economy. It is this same winning strategy that the government is introducing in **promoting the use of the Internet and the development of e-commerce** (bold in original).*

(Bernard Landry, Deputy Prime Minister & Minister of State for the Economy and Finance in Quebec, 2000; i)

The above quote clearly illustrates that the province of Quebec both adheres to and is implementing the same technological vision as that of the federal government. The similarity of vision is worth noting as, historically, these two political entities have taken adversarial positions on most policy issues. Yet on this issue, basing future economic prosperity on the development of the new economy via high-technology clusters, these common adversaries come to the

same conclusion: the development of ICT/Internet/E-commerce clusters constitutes the new economic imperative.

This opinion is most explicitly stated in a recent document produced by the Greater Quebec Economic Development Corporation (2000: 1): "Over the past decade, information technology products have been at the heart of the economic development and competitiveness of industrialized countries... (and) Governments at both the federal and provincial levels are aware of the potential inherent in the industry. Information technology products occupy a *privileged position* in government development strategies." It is this 'privileged position' of information technology products and services in Quebec that is the focus of this chapter. Specifically, the chapter begins by briefly outlining how the province of Quebec has accepted, and is now deploying the vision of the new economic imperative, and then investigates its implementation at the local level through the case study of Montreal - the central ICT cluster in Quebec.

The Province of Quebec: Branding Itself in the Global Marketplace

I believe there is a closer coupling between business and government here in Quebec than anywhere else... The Quebec government sends out very pro-business and supportive signals... (Richard Peabody, President of Harris Canada, taken from Quebec, 1998d).

Proceeding the announcement of the 2000 Provincial Budget, in which substantial promises were made with respect to increasing Quebec's presence on the Internet, the Province issued the *Quebec On-Line* document outlining the

strategy by which it aims to achieve the said promises. In the early pages of the *Quebec On-Line* document there is a passage that articulates the fundamental nature of the new economic imperative. It demonstrates an acknowledgement on behalf of the Quebec government of the political and economic realities of the new economy, as opposed to the purely technological realities that are usually employed to characterize the situation:

The use of the Internet for the market economy allows the complete decompartmentalization of commercial relations throughout the world, and culminates in the internationalization of trade between all sorts of economic agents...

...The involvement of businesses in e-commerce is not only a development opportunity. It is often a question of survival, given the decompartmentalization of markets made possible by the arrival of consumers on an open electronic network (Quebec, 2000a: v-vi).

This passage illustrates that the Quebec government utilizes the same key assumptions as those outlined in the opening chapter of my study: the spatial mobility of capital is altering the balance of power between capital and the state, and this is having an impact on regional and local governance. The Quebec government acknowledges that investments across space are altering the economic geography of capitalism resulting in a rearticulation or 'recompartmentalization' of the capitalist production system. This rearticulation of the production system changes the traditional relationship between capital and the state in favour of global capital, hence the reference to this situation being a 'question of survival'. Therefore, while often cloaked in an aura of the technological sublime, this brief passage demonstrates that there is the

recognition of wider political and economic influences that shape the situation.

While it is important to recognize that the Quebec government acknowledges and understands the dynamics of the new economic imperative, the primary focus of the following discussion is to investigate how the province has gone about cultivating and deploying its strategy to take advantage of the new economic imperative and, moreover, to link it to broader changes taking place at the local level. Quebec recognizes that attracting foreign capital investment into the region represents the province's primary opportunity for growth (Quebec, 1996: 20). Accordingly, the province has employed a strategy that focuses on selecting a number of key issue areas that are deemed essential to attracting foreign capital investment in the high-technology fields. In particular, six key issues areas are being used to 'brand' or market Quebec as an attractive *place* or environment for foreign capital investment.

I argue that the provincial government is focussing its efforts and limited resources on building and maintaining a favourable and conducive environment for foreign high-technology investments at the expense of other more local, social needs such as a wider range of job creation, a balanced and symmetric overall economic development agenda, or even public housing. In effect then, this chapter elucidates on how the role of government is changing from that of the regulator of national/foreign capital to the suitor of national/foreign capital.

In the case of Quebec (as generally with most regions that now engage in fierce competition for global capital), the key issue areas emphasised for the purposes of attracting foreign capital are¹⁸:

1. Quebec, A Strategic Location:

Quebec hails itself as a strategic location for international firms poised to

"conquer North American Markets," which represent an extended marketplace of 393 million consumers (Quebec, 1998a). Moreover, due to its proximity to many major American centres, the province offers "privileged access to U.S. markets" thereby making Quebec "highly attractive to European, Asian and other multinationals" (Quebec, 1996: 7).

2. A Large Pool of Highly-Skilled Workers:

With respect to its labour force, Quebec boasts: "[I]n terms of the number of undergraduate degrees per 10,000 inhabitants, Quebec outranks OECD member countries with 62 graduates per 10,000 citizens, compared to the United States (41), France (32), and Japan (31) ... (with respect to) graduate degrees, Quebec comes third behind the United States and France" (Quebec, 1998a). In turn Quebec claims to have a large pool of qualified labour ready for employment in high-technology industries.

¹⁸Much of the information gathered on these six policy areas is taken directly from a provincial government website *Investing in Quebec* run by the Ministry of Industry and Commerce. The website provides strategic information aimed at foreign companies/individuals that are looking to invest in Quebec. In effect then, these policy areas outlined via the website and other channels (i.e. reports brochures, etc.) constitute key marketing tools by which the province aims to 'brand' Quebec as a conducive *place* for investment. Parenthetically, the same website has the exact same information with respect to Montreal (see: www.mic.gouv.qc.ca/index_en.html).

3. World Class Universities and Research Institutes

Quebec's educational institutions "are consistently adapting their programs to respond to the market needs and changing technology. The interaction between the academic and business worlds contributes to the transfer of knowledge, which in turn increases productivity and improves production quality" (Quebec, 1996: 8). Specifically with respect to the ICT industries, Quebec professes to have 16 universities that produce 6,300 graduates each year in Applied Sciences, with 7 universities offering full engineering programs. In 1997, these institutions graduated 1,446 students in computer science, 222 in computer engineering, 857 in electrical engineering and in mathematics (Quebec, 1998a). Moreover, there are four key research centres and specialized organizations that focus on the ICT sector: The Centre de recherche informatique de Montreal; The National Optics Institute; The Centre d'expertise et de service en applications multimédias; and, Centre francophone d'informatisation des organisations (Quebec, 2000b).

4. High-Tech Sectors of Excellence:

Quebec proffers to be a competitive and innovative economy that is technologically advanced, and asserts that it is a leader in the telecommunications, information technology, aerospace, pharmaceutical and biotechnology high-technology fields. The province claims to host "major concentrations (clusters) of enterprises in the knowledge-based industry" (Quebec, 2000b), and is a "highly diversified postindustrial economy, which is competitive and open to international markets (Quebec, 1996: 31). With respect

to the telecommunications industry alone, Quebec boldly states that Montreal has numerous established or anchor companies, including: Nortel, Ericsson, Harris, Teleglobe, Bell, AT&T and Vidétron (Quebec, 2000b).

5. *Competitive Operating Costs & Conducive Business Environment:*

Compared to other major industrial centres, Quebec claims to have extremely competitive operating costs (i.e. labour, construction, telecommunications, leasing office space, electricity, natural gas and taxation). With respect to corporate taxation, Quebec asserts to have one of the most advantageous systems in North America. It is geared to favour the most innovative firms whose profits are growing, and it provides one of the most competitive R&D tax credit systems in the world. Moreover, the province also lists numerous fiscal measures that have been undertaken to ensure a competitive and conducive business environment for foreign multinationals investment, such as: programs to foster economic growth and job creation; free trade agreements; a world class infrastructure; and, an excellent exchange rate (Quebec, 1998c).

6. *Leading Centre for Venture Capital:*

Quebec professes to have a rapidly expanding venture capital industry which now constitutes the largest centre for venture capital in Canada: 51% of the estimated \$10 billion of venture capital in Canada comes from funds generated in Quebec. In 1998 alone, venture capital companies invested \$630 million in 435 Quebec enterprises (Quebec, 2000b).

In addition to these six key issue areas, Montreal has also attempted to leverage the unique and sensitive issue of culture and language in its attempt to attract foreign capital investment. Montreal claims to have the largest bilingual labour force (French and English) in Canada, and a large number of people for whom English is their mother tongue (Quebec, 2000b).¹⁹ It is important to note that, when Quebec discusses the issue of bilingualism, it infers English as a second language. Interestingly then, the local and provincial authorities advertise and market the ability of the workforce to speak and work in English. As we will see in chapter eight, there is a stark difference between this position and the position as outlined in Bill 101, *The Charter of the French Language*, causing a dichotomous contradiction between the provincial government's socio-cultural and economic policy goals.

By focussing on these six key issue areas, the direction and nature of economic development in Quebec has changed over the last two decades. This fact is proudly asserted by the provincial government in *Doing Business in Quebec*, a recent document prepared to "give foreign companies and individuals considering doing business in Quebec a brief overview of (the) province's competitive advantages" (1996: 3):

Quebec's economy has undergone profound changes over the last 20 years. From a traditional economy based on natural resources and the exploitation of raw materials, Quebec has experienced major changes in terms of domestic consumption, increased use of new technologies by its

¹⁹Note: this issue will have some importance in chapter eight.

small and medium-sized manufacturing companies, and rapid growth in the high-tech industries and its highly qualified work force has also grown considerably (Quebec, 1996: 31).

In turn, by focussing on the above-mentioned six key issue areas, the government of Quebec has worked diligently to transform not only its economy, but also the way in which the province (and its major centres) are perceived and understood. In short, the province has undergone the deliberate exercise of 'rebranding' the province in general, and Montreal in particular, as a post-industrial high-technology centre awaiting foreign capital investment to fuel the city's burgeoning high-technology clusters.

Quebec's economy is centred, by and large, in the greater Montreal area. Therefore, to comprehend the abovementioned changes more acutely, it is essential to investigate them at the local level. By doing so, one can identify some wider social, cultural, political and economic implications associated with the processes of de-industrialization and with the rise of the new economy in Quebec.

Transforming Montreal: The Development of a High-Technology District

Between 1971 and 1986, the city of Montreal lost approximately 70,000 manufacturing jobs, or more than thirty-six percent of its industrial base (Léveillé & Whelan, 1990: 152). This loss was predominantly felt in the traditional industries that had once supported the local economy, such as leather

goods, textiles, and the economy centred around and relying upon the ports.

This process of deindustrialization, sparked by fierce foreign competition and the changing nature of the international division of labour (see Feagin & Smith, 1987; Glickman, 1987), encouraged an exodus from Montreal's downtown core, out towards the suburbs and surrounding regions (Léveillé & Whelan, 1990: 153).

In an attempt to combat these developments, local authorities sought to cultivate and implement an economic and urban revitalization campaign. This campaign was based upon an industrial strategy centred around the development of industrial 'clusters' (Johnson; 1994: 257). In particular it has been high-technology clusters, and even more specifically the ICT cluster, that has been delineated as the primary cluster(s) to be developed.

The revitalization campaign included a private-public partnership that, between 1980 and 1990, saw the construction of ten industrial parks. The campaign focussed on attracting R&D organizations and facilities of the high-technology industries. The local government thus focussed on creating an amenable environment for business development, which included the development of housing for approximately 20,000 white collar workers (Léveillé & Whelan, 1990: 162).

The provincial/municipal government-led industrial strategy eventually gave way

to a capital-led approach, however, in that the governments incrementally stepped back and adopted the role of the 'facilitator of capital' rather than the 'regulator of capital' in the development and formation of the industrial clusters (Johnson, 1994: 258). The local and provincial authorities believed this to be the most efficient way to bring about not only economic renewal but also urban renewal, as the workforce for these industries are generally highly educated and white-collar. As one account states:

Montreal city governments have not been active in the field of housing, except for the preparation of sites for private investments. In some older parts of the city, City Hall was happy to support the destruction of houses to make room for expressways, office buildings, or other investments. At the other end of the spectrum, they did not try to develop programs for public housing. (The city) Government's intention was to build a city of white-collar workers of the tertiary sector. The departure of unskilled industrial workers was seen as an inevitable, if not desirable, result of the transition to a tertiary sector city (Léveillé & Whelan, 1990: 164).

This process of gentrification, obfuscated under the mask of a revitalization campaign, underlines rather succinctly the ways in which local governance and local authorities perceive the importance of facilitating a conducive environment for business growth over that of more pervasive social needs such as local public housing.²⁰

This *economic* revitalization campaign, which is still going on today, seems to be working. Over the last decade the province of Quebec, and in particular the city of Montreal, has been the destination for large amounts of foreign capital

²⁰These differences are not only visible in policy choices but also in the ways in which public space is utilized within the local community, an issue which is dealt with in more depth in the next chapter through an examination of the Cité de Multimedia and E-Commerce Place.

investment. For instance, from 1989-1998, there has been over CND\$20 billion in direct foreign investment (Quebec, 1998b). These investments have been a central factor in the development of a strong high-technology district in Montreal, consisting of aerospace, bio-technology, and information and communications technology (ICT) sectors.

As explained earlier, the primary concern here is the development of the ICT cluster, which constitutes the core high-technology cluster. The Montreal ICT cluster has recently experienced substantial growth due to the increasing presence of foreign multinational investment. In 1996-1997 alone, the last year in which data are available, there were over \$600 million in foreign investment in the ICT sector (Quebec, 1998b). Multinationals constituted the largest sources of this investment, major examples being: BAAN (Netherlands) \$50 million; Nordex/CDT (US) \$75 million; Ericsson (Sweden) \$100 million; Ubi Soft (France) \$130 million; and, HTMF - Hicks, Muse, Tate & Furst (US) \$180 million. Therefore, in Montreal there has been a conscious effort directed towards implementing policies aimed at fostering a process of spatial convergence or agglomeration of a dense ICT cluster.

The Anatomy of the Montreal ICT Cluster

To date, the most prominent industries in the Montreal ICT sector have been the telecommunications and computer industries, followed by the multimedia and electronics industries. Montreal is home to almost fifty percent of the entire Canadian telecommunications market (Montreal International, 1998a; Quebec, 1998a) and, telecommunications equipment now ranks as the second largest export in the Quebec economy (Quebec, 1997). Thus it appears that Montreal in particular, and Quebec in general, increasingly has linked its economic viability to the success of the ICT sector, as increasingly its economic stability is tied to the success or failure of those industries. As such, the level of attention paid to these sectors by local and provincial governments is considerable. Ensuring a conducive business environment for the companies within this cluster is an important policy concern, considering that continued economic prosperity within the region is so closely tied to the success of these enterprises.

The telecommunications portion of the cluster is anchored by national companies such as Bell Canada, Microcell, and Teleglobe Canada, and transnational companies such as Ericsson, Nortel Networks and Harris Canada (US based). *Figure 8* demonstrates the prominence of this industry in the Quebec economy.

FIGURE 8²¹

Telecommunications in Quebec in 1997	
Number of Companies	384
Number of employees	53,800
Production value in billions of dollars	16.4

The computer industry, as *Figure 9* demonstrates, while having a substantially larger number of companies, has fewer employees and smaller revenues. As in the telecommunications cluster, however, the computer industry in Montreal consists of a number of large anchor firms such as CGI, DMR (IT Consulting), LGS, and SHL Systemhouse (an MCI subsidiary).

FIGURE 9²²

The computer industry in Quebec in 1997	
Number of Companies	2,949
Number of employees	25,400
Production value in billions of dollars	3.2

The multimedia & Internet services and electronics industries round out the ICT sector. These industries are comparatively less influential than the telecommunications and computer industries. However, the growth of the

²¹Source: Quebec, 1998a.

²²Source: Quebec, 1998a.

multimedia industry in Quebec is worth noting. Within its short history, the Montreal multimedia industry has grown at a rapid pace and currently consists of over 600 firms and over 4,300 employees (Quebec, 1998a). Moreover, this industry is gaining international prominence as its companies increasingly produce quality products for high profile projects such as the special effects for blockbuster movies like *Jurassic Park* and *Titanic*. This distinctive niche has drawn a number of multinationals to the Montreal area, a recent example being Ubi Soft from France which has invested over \$130 million in the area.

The Montreal ICT cluster generated over \$20 billion in revenues in 1997, and consisted of over one-hundred multinationals employing over 80,000 people (Quebec, 1998a). Consequently, the influx of multinationals into the Montreal ICT cluster is changing the economic landscape of the city and, in turn, the social, cultural and political landscape as well.

While capital, specifically multinational capital, is the driving force in recasting the economic landscape of Montreal, it must be underscored once again that the provincial and local governments have facilitated this process through the implementation of business-agreeable initiatives and policies, and that the industry has recognized and exploited this. The strategy employed by Montreal to attract these multinational corporations and direct foreign investment is an extension of the strategy employed by the province and the country as a whole (see the six key issue areas outlined above). The word *extension* is meant to be

taken literally, as the informational/promotional websites, brochures and other communications materials use the same information, cross-reference each other and have the same 'look and feel' thereby demonstrating an organized and coordinated effort. Moreover, like the Provincial government, Montreal has focussed on the same key issue areas in an attempt to brand or market the city to global capital (Quebec, 2000b).

Such efforts clearly illustrate the *mutually constitutive relationship* between business and government in the development of the Montreal ICT cluster. One should not presume, however, that this relationship is equal or linear. With the global mobility of capital and the internationalization of business activities increasing, capital is developing a stronger position with respect to its relationship with the state.

***The New Economy in Montreal & the Role of the State:
A Mutually Constitutive Relationship***

With respect to the Montreal high-technology clusters, the nexus of this mutually constitutive relationship is manifest in the institution *Montreal International*.

Montreal International is self-defined as a private, independent, nonprofit organization which exists to coordinate, accelerate and intensify the development of the international activity in the greater Montreal area (Montreal International, 1998a). It receives financial support from all three levels of government and the private sector. Its membership totals over one-hundred

companies. There are two main categories of businesses that belong to Montreal International. The first consists of major infrastructure and services firms such as airports, airlines, and telecommunications services providers, in essence those who would benefit the most from foreign multinationals moving into the Montreal area. The second category consists of firms which are already part of the current agglomeration of high-technology firms, and which wish to increase the density of their clusters and regional networks.

Montreal International has a number of functions: it scouts for foreign investment; hosts foreign trade missions; coordinates trade missions abroad; and, 'provides assistance to help *strategic workers* and their families settle in greater Montreal' (Montreal International, 1998a). Further, the institution has distinct departments that concentrate on each individual high-technology cluster (i.e. ICT, biotechnology, pharmaceutical).

In the first quarter of 2000 (between January and March), Montreal International has been successful in generating 33 investments, expansions or reinvestment programs from 33 distinct companies, totalling \$481.5 million. This prospecting represents 2,712 future jobs in the Montreal area (Montreal International, 2000: 11). Most of the largest investments are in the information technology and multimedia industries, and all 33 prospects are foreign investments: 18 from the United States and 15 from Europe. These results, stemming from the efforts of

Montreal international, demonstrate the sagacity in which the provincial and municipal authorities are approaching this issue. Not only are they working to create a conducive business environment via focussing on the six key issue areas outlined in this chapter, but they are also leveraging these tools through the institution of Montreal International to attract, retain and expand foreign capital investment within the ICT (and other) high-technology cluster(s). This demonstrates, quite powerfully I believe, the constitutive role of the state in the process of creating Montreal's high-technology cluster: they are a key player.

The New Economic Imperative at the Provincial and Local Level: Conclusion

The new economic imperative in cities, in this case Montreal, to attain investment and secure nodal positions on the corporate global networks results in an increasing emphasis on urban governance oriented around public-private partnerships such as Montreal International. These partnerships are geared explicitly towards an agenda of economic development, as outlined in via the province's six key issue areas, rather than on a social and redistributive agenda (Graham & Marvin, 1996: 42-43).²³ Hence the development of the ICT cluster in Montreal has had and is continuing to have ramifications on local

²³ Jobs are viewed as one of the key derivatives of this process, and I must acknowledge that employment can be seen as having social benefits. However, in this case, I argue that such social benefits are merely the consequences of a strictly economic vision employed under assumptions that leave no other feasible alternative (see chapter four for discussion of the four core assumptions). Social and cultural benefits have not been weighed against the economic benefits, they have been an afterthought, augmented to the economic vision so as to appease those who are critical of such unilateral thinking.

policies, planning and *governance*.

As outlined in this chapter, Quebec views the development of the ICT high-technology cluster as the new economic imperative that holds the key for regional economic growth. As such, the province is focussing on creating a conducive business environment for the purposes of establishing an agglomeration of such firms. These firms have a strategic negotiating advantage over the local and provincial authorities, however, in that they can divide and separate aspects of their production/business process and rearticulate them across the globe in individual regions that are amenable to their individual production/business process needs. The intense focus of the Quebec and Montreal authorities on the six key issue areas, as well as on marketing, advertising and branding the region, is the practical manifestation of the shifting balance of power in the relationship between capital and the state. This shift in power, in favour of capital, results in the role of the state being transformed from the regulator of capital to the facilitator of capital: hence, affecting governance at the local level.

This process, facilitated by the mutually constitutive, yet increasingly imbalanced, relationship between capital and the state, must also be understood as a political project in which the exercise of power impacts the wider social totality, including the cultural and the social lives of people (Mosco, 1999: 110). It is towards this wider social totality that the following chapter now turns.

VI. Reconstituting Space: Montreal as a Post-Industrial City

In order for capital to leverage the potential of Internet and to be able to conduct business in real-time across the globe, it is crucial that businesses have access to high-speed, broadband ICT networks. As such, countries, regions and cities have put tremendous resources towards developing their information infrastructure. Studying such trends, Graham & Marvin (1996: 34-35) note that the ICT infrastructure of cities has become one of the paramount issues in attracting capital, especially high-technology capital, and that "investment in telematics - the basic information infrastructures of cities - now surpasses investment in other machinery."

In Canada, the construction of the ICT infrastructure for the emerging digital economy has been, for the most part, left up to private sector investment in a competitive marketplace.²⁴ In turn, it is widely felt that the government has relatively little to do with this dimension except for ensuring a fair and transparent competitive marketplace. Contrary to this belief, however, with the wider shifts towards economic globalization (i.e. the global mobility of capital) we are witnessing an increasingly important role for governments in providing the necessary infrastructure for high-technology development: *the creation of post-industrial spaces*.

²⁴Although, it can be easily argued that this situation is a relatively new phenomenon. For the better part of the 20th Century, the Canadian telecommunications industry was a regulated monopoly. For more on the history of telecommunications regulation in Canada see Winseck (1998), Martin (1991) & Babe (1990).

Post-industrial spaces are the physical buildings and locations that are constructed to house high-technology companies, commonly referred to as 'technoparks'. These high-technology complexes provide the necessary access points to high-speed broadband networks and are designed for the specific needs of high-technology companies. By creating these technoparks, cities and/or regions provide a 'ready-made' environment for companies that would otherwise have had to spend substantial resources to create such spaces.

Investment in the creation of post-industrial spaces or 'technoparks', which essentially equate to a '*Plug'n'Go system*' that allows business and casual workers to move in and plug into physical and cyber networks (Mosco, 1999: 108), has been a key strategy of the Quebec government. As mentioned earlier, between 1980-1990, there were ten industrial technoparks built in and around the Montreal area. Thus an imperative dimension of Montreal's overall strategy in developing itself as a ICT high-technology cluster, and thus as a global nodal point for foreign investment, is the construction of 'post-industrial spaces'.

Post-industrial spaces are regarded as a key element of the economic infrastructure necessary to conduct business in the new economy, and are designed specifically for companies that engage in it. Therefore, the *new* economic imperative driving the *new* economy requires the development of a *new* spatial and economic geography. The focus of this chapter is to examine

the development of this new spatial and economic geography through an analysis of two specific post-industrial spaces in Montreal, the Cité du Multimédia and E-commerce Place. An important dimension of this analysis is to highlight some of the social, cultural, political and economic contradictions inherent in the implementation of these projects, and in the construction of post-industrial spaces.

The Cité du Multimédia

The Cité du Multimédia, a creation of the Quebec government, is a massive section of Montreal devoted entirely for the multimedia industry. Established on June 15, 1998, the Cité du Multimédia consists of twenty-two buildings situated in the Faubourg des Récollets, within a quadrant bordered by de la Commune, Duke, William and King streets (Quebec, 1998e). The overarching purpose of constructing the Cité is to create an economic and "vertical hub for engineers, programmers, computer scientists, computer graphics designers, animation specialists, and technicians working in such fields as the production of special visual effects for film and television, the designing of websites, the development of recreational and educational software, and digitized 3D images" (Quebec, 2000b) - i.e. to physically cluster the industry thereby agglomerating all the essential technical and business services necessary for the operation of the industry.

As such, the buildings within the Cité are renovated, re-wired, re-branded and

re-presented to Montreal and the international community as a post-industrial space with all the 'connections', both physical (i.e. floor space and business services) and electronic (access to high-speed, broadband networks), necessary for cutting-edge multimedia firms to operate. This is all financed by the provincial and municipal governments.

The Cité du Multimédia is constructed in and around the Old Port area in Montreal, a section of the city that has been, historically, a dense industrial area. As discussed in the previous chapter, this area was hard hit by the deindustrializing trends in the 1970s and 1980s. In an attempt to shatter the remnants of its industrial past, the Cité and its surrounding area is renovated and reconstructed as a high-tech Mecca for the multimedia industry. Thus the Cité represents an attempt at (or the process of) reconstitution, from a rusted and/or dying industrial past to what Mosco (1999: 107) characterizes as a city espousing a 'postindustrial economic allure'. It is akin to "a cyber version of the phoenix myth: in this case the city is reborn from the ashes of its industrial past" (Mosco, 1999: 107).

City officials are not banking on the Cité du Multimédia's post-industrial economic allure alone, however. The provincial and local authorities have implemented a complementary economic strategy by which to attract firms to the Cité. The main incentive that the government has employed to induce these firms to relocate, besides that of actually building the Cité, is an extensive

subsidization program in the form of employee tax credits for *eligible firms*. To qualify as an eligible business an enterprise must engage in: a form of design, production, or servicing of multimedia products, or; a specific service related to information technologies. Moreover, to be designated as such a business, an enterprise must obtain an official permit from the Minister of Finance (Quebec, 1998e). Up until June 15, 1999, the Quebec government provided a tax credit worth sixty percent of an eligible employee's²⁵ salary, up to a maximum of \$25,000 per annum. After June 15, 1999, and until June 15, 2010, the government offers a reduced tax credit - forty percent of an eligible employee's wages, up to a maximum of \$15,000 per annum (Quebec, 1998e). To date, Quebec has committed \$360 million worth in tax credits to the multimedia industry, "which is developing rapidly in a rundown section of the city" (Canadian Press, 2000: B5). Currently, over 70 ICT companies are housed in the Cité du Multimédia (Quebec 2000c), including Teamsoft, Discreet Logic, Cognicase, Génération Net; Versitile Media One, Voodoo Media Arts and Trigonix (Quebec website, 2000b).

It is essential to analyse the development of the Cité within its wider social totality in order to fully understand some of the correlational impacts associated with this project. One such impact or issue is that of territorial and social

²⁵ An eligible employee is defined as: an entrepreneur, supervisor or direct support skilled-staff person working within a defined industry, in a company that has a permit from the Finance Minister (Quebec, 1998e).

redistribution and justice. As aforementioned and as described here, the provincial and local authorities have been quite willing to facilitate industrial and economic projects geared towards implementing the new economic imperative while, at the other end of the spectrum, have not been helpful or willing to invest in social policies such as public housing projects (Léveillé & Whelan, 1990).

The building of the Cité demonstrates another dimension of this political project - the managing of the local population. Through the construction of post-industrial spaces and the expansion of the ICT cluster, the government is able to gentrify previously run down spaces or places within the city.

The reconstitution and re-presentation of these areas incrementally raise the property values in the surrounding areas. This is true of both residential and business spaces. As the supporting services for such clusters emerge, be it a Starbucks, health club or a new media advertising agency, the nature, culture and economic value of space and place in these areas change. Thus the once rusting, old industrial portion of the city, in which housing and business costs were low, are transformed into a post-industrial oasis of high-technology. As a consequence, those who can not afford to pay the costs of rising rents must move to a different location. What is beginning to happen is that these people are driven into particular or even designated areas within the city, safely away from the burgeoning new economy so as not to take away from the post-industrial sheen.

While economic and urban revitalization is not in itself a bad thing, and most would even argue that it is highly agreeable, it cannot be done within the vacuum of a purely economic perspective. There must be consideration given to the wider social ramifications - i.e. gentrification - that correlate with such economic/infrastructure programs. There should be an accompanying social strategy to deal with the people who are socially, economically and physically displaced by this process. Such economic revitalization is not sustainable if it is accomplished by simply displacing the unwanted or unnecessary into socio-economic ghettos. I use the term socio-economic ghettos in so far as the people involved in this process are not trained/retrained to work in the new economy and are not skilled to leverage the technologies and services enabled by its emergence. Henceforth, they are placed into particular socio-economic zones that are effectively outside the emerging new economy of Montreal, with little or no consultation, consideration, or regret. In broad terms, this is the segment of the population that the United States, in particular, have come to acknowledge and identify as being situated on the negative end of the emerging 'digital divide' (US 1999). In short then, while the Cité represents an industrial and economic project, it also constitutes a social and political project of gentrification and thus one must examine in unison the social and economic aspects of this issue.

E-Commerce Place

In the same way that the Cité du multimedia allowed Quebec and Montreal to mark their places on the world map as leaders in creativity and progressive technology, E-Commerce Place...will allow this region to be recognized as a key hub globally for the new economy (Alban D'Amours, President of the Mouvement des caisses Desjardins - part of the development consortium involved in the creation of E-Commerce Place in Quebec, 2000d)

The designed site concept, already used for the Cité du multimédia, is one of the keys to its success: it will help quickly build a critical mass and synergy between companies developing and supplying products and services relating to e-commerce. In addition, the buildings constructed for E-Commerce Place will be perfectly adapted to the needs of the companies they accommodate: E-Commerce Place will consist of "smart" buildings whose structures and components will be defined according to the requirements of e-commerce...

...The creation of E-Commerce Place is accordingly an essential new piece in the fiscal and financial array put in place in recent years to accelerate the modernization of Quebec's economy (Quebec, 2000e).

Following the (perceived) success of the Cité du Multimédia, the Quebec Government announced another massive new economy project: *E-Commerce Place*. *E-Commerce Place*, to be situated in the quadrilateral formed by De la Montagne, Saint-Antoine and Lucien L'Allier streets and René-Lévesque Boulevard, is projected as a \$700-million complex of nine office towers constituting over 284,000 square metres or three million square feet, in downtown Montreal. Proposed to be completed in 2005, *E-Commerce Place* is expected to house over 20,000 workers involved in the growing Internet economy. Promoters of *E-Commerce Place*, the most fervent of which is Quebec Finance Minister Bernard Landry, expect that half of the 20,000 jobs housed in this complex will be from Quebec companies with the rest coming from firms outside the province (Canadian Press, 2000: B5).

Like the Cité du Multimédia, E-Commerce Place offers more than just the incentive of the physical infrastructure. It goes beyond its mere post-industrial allure and offers a series of tax incentives to eligible companies. Eligible companies are those that engage in activities pertaining to either the development and supplying of products and services related to e-business, or activities relating to the operation of e-business solutions, consisting of the management, operation, maintenance and development of systems, applications and infrastructures, including technical assistance services to business and customers (Quebec, 2000f: 3).

Specifically, eligible companies can claim 25% of eligible salaries²⁶ up to a maximum of \$10,000 per annum, per employee. While the tax incentive is valid until December 31, 2010, the rate of the tax credit may be reduced after the fifth year if the eligible company has not created a sufficient number of jobs in Quebec (Quebec: 2000f: 3). It is estimated that, within the first ten years, the Quebec government will provide \$1.5-billion in tax credits to e-commerce related firms that move to the site (Canadian Press, 2000: B5).

The Quebec government has been quick to both promote and defend its decision to allocate such extensive resources in this particular new economy

²⁶ In general, eligible salaries can be understood as being demarcated via the division of knowledge-workers vs. Administration staff). For more detailed information on eligible salaries, companies, activities and employees see: Quebec, Ministry of Finance, Bulletin D'Information, May 11, 2000 3

industry/sector. The Provincial Finance Minister, Bernard Landry, asserts: "This is an interventionalist government. We make no apologies for that...The subsidies we pay out (to the tenants of E-Commerce Place) will be repaid in the form of taxes collected in five years. After that, the money coming in will be net, net, net" (Marotte, 2000a: T5). In fact, the Quebec government is using an interesting, culturally specific analogy to describe the potential impacts of E-Commerce Place: *the James Bay of e-commerce*. This analogy is captured quite succinctly in a recent newspaper article and is worth noting:

In the early 1970s, Quebec premier Robert Bourassa promised the creation of 100,000 jobs with the "project of the century", the publicly funded James Bay hydro-electric project.

Thirty years later, upbeat politicians, bankers and developers gathered in Montreal recently to proclaim the new project of the century: a sprawling 3.5-million-square-foot electronic commerce "campus" in the downtown core that is pegged to generate 20,000 direct New Economy jobs and 60,000 indirect positions.

"This will be Montreal's James Bay development, only of a more permanent nature," said beaming Mayor Pierre Bourque about E-Commerce Place...
(Marotte, 2000a: T5).

Not everyone in the province is quite as convinced, however. To date, those most vocal on the issue have been the real-estate industry and political opponents. Each of which criticize the Quebec government on a different front.

The real-estate industry, represented by developers' lobby groups, are upset because projects such as the Cité du Multimédia and E-Commerce Place target acute industrial niches while neglecting the rest of the economy. In fact some

have called it a subsidy that “is blatantly discriminatory” (Gibbens, 2000: C5). In turn these groups have called for the government to offer the subsidies to a more general business audience (i.e. not just high-tech), which would spread the prosperity of the current economic upturn more pervasively to those who have suffered in the past, and not just to those participating in the new economy. The position forwarded by these groups is that while “Anything the (finance) minister can do to improve the economic outlook of the city of Montreal is applauded by the real-estate industry... However, when programs confine themselves to a specific area and benefit specific groups, then we have a problem with that” (Canadian Press, 2000: B5).

A study, commissioned by the Urban Development Institute of Quebec in February 2000, appears to validate the concerns expressed by the real-estate industry. The study finds that “the landmark 3.5 million square foot E-Commerce Place development will dissuade e-commerce companies from moving into other, non-subsidized office buildings in the city. In addition, the project will create a glut of vacant space in the city that will amount to 4.7 million square feet” (Ebden, 2000: B5). Daniel Dorey, head of Quebec operations for Oxford Property Group, a large property owner in the city, has been one of the most outspoken people on this issue, asserting:

E-Commerce Place and the fast-growing Multimedia City near Old Montreal, also heavily subsidized, together would add four million sq. ft. of office space within five years to a fragile downtown market ... prime office space demand hasn't topped one million sq. ft. since 1988 and average annual 1990-99 absorption was only 345,000 sq. ft. Imagine

what will happen with four million sq. ft. suddenly opening up. The vacancy rate will bounce from 12% now to 18.5% or near the 1990-2 recession high (Ebden, 2000: B5).

While the development of E-Commerce Place and the Cité du Multimédia demonstrate the practical application of the Quebec government's policy rhetoric of *'providing the ICT industries with a privileged position within the Quebec economy'*, it also brings to the fore some of the contradictions and growing contestations this policy position creates. The Quebec government's singular focus on high-technology growth is alienating other industrial sectors that have traditionally been, and continue to be, extremely important to the Quebec economy. Moreover, many of these industries are 'home grown' whereas much of the government's high-technology focus is on foreign multinationals. It will be interesting to see how some of these contradictions and contestations play out in the political arena when it is time for people to vote on issues of governance at the local and regional levels. Currently it appears that they are neglected in the government's pursuit of developing the new economy in the region.

An interesting development has already occurred with respect to possible political ramifications. Jean Charest, leader of the official opposition Liberals within the province of Quebec, has "accused the government of rifling through the pockets of tax payers to subsidize wealthy companies...(and) asked why the government is willing to grant up to \$300-million (in tax credits) to CGI (who has agreed to move to E-Commerce Place), which last year had revenues of \$1.4-

billion, and similar credits to Electronic Data Systems Corp., an American company with \$19-billion in revenue" (Canadian Press, 2000: B5). Lucien Bouchard answered this criticism by stating, "It's completely normal and imperative that we [the government] be among the pioneers in putting down the foundations of tomorrow's economy, in particular multimedia and electronic commerce" (Canadian Press, 2000: B5). While this exchange of ideas may be discarded as simple political manoeuvring, it demonstrates, along with the aforementioned criticism by the real-estate industry, a much more significant development: critical points of view questioning the dominant system, and avenues of resistance within the hegemonic discourse of the new economic imperative in Quebec. The scope of this study restricts an in-depth examination of these avenues of resistance and emerging critical perspectives. Still, it would be most useful to investigate these movements in order to comprehend the impact of these developments within a wider perspective. A serious analysis of such non-hegemonic discourses would help to understand the entire scope of this issue. As it is, I am bringing to light some of these competing discourses not only to put forward their existence but also to ensure a more complete discussion on this issue.

Conclusion: Post-Industrial Spaces as Social, Cultural and Political Projects

One of the central themes of this chapter is the importance of examining the wider social, cultural and political impacts associated with the reconstitution of

space (manifest here as the creation of post-industrial economic places).

Projects such as *The Cité du Multimédia* and *E-Commerce Place* are often presented as merely economic, industrial, or simply infrastructure projects distinct from the social, cultural and political realms of peoples lives, which, as we have seen so far, is far from the truth. There are implicit and explicit impacts felt within the wider social totality that must be recognized and brought to the fore, one of them being the process of gentrification.

With governments courting spatially mobile capital, in this case by physically and financially subsidizing them in an attempt to create 'clusters' of activity, one witnesses the purely economic vision being employed, and some of the real and potential social ramifications. This illustrates how the role of the state and its relationship to capital is changing, from that of regulator to the facilitator of capital. Moreover, these projects exemplify how foreign investment is treated "as a Dutch auction in which local labour forces (and local states) bid - like whores - for the favours of mobile capital" (Elliott, 1999: 14).

Therefore, "we must be insistently aware of how space can be made to hide consequences from us, how relations of power and discipline are inscribed into the apparently innocent spatiality of social life, how human geographies become filled with politics and ideology" (Soja, 1989: 6). In sum, questions concerning technical or organizational means are also, by default, social and political questions about ends (Ferguson, 1986: 52). The next chapter continues to

investigate some of these social and political questions associated with the implementation of the new economic imperative, specifically in relation to the issues of labour and culture.

VII. Labour, Culture & the New Economy in Quebec²⁷

As mentioned earlier, in a recent study examining the key ingredients necessary for the development of Internet clusters,²⁸ 125 of the top Internet executives in the United States were asked to cite the factors most critical in determining company location. The reason cited most often was the availability of a talented pool of labour. This response corresponds with the numerous accounts from popular media, industry and governments that consistently refer to a shortage of skilled, high-technology labour: the now infamous Canadian problem of 'the Brain Drain'. In short, the creation and retention of a skilled and affordable workforce is paramount for high-technology development within a particular region.

This chapter examines the attempts at creating a high-technology labour force in the Quebec/Montreal economy. While the majority of discussions surrounding this issue focus on three particular implications of high-technology development on the labour force: the polarization (Markusen, 1985; Weiss, 1985; Sassen, 1996; Segal 1998), stratification (Markusen, 1985; Aronowitz & DiFazio, 1994; Sussman & Lent, 1998; Segal, 1998) and displacement (Weiss, 1985; Forester

²⁷ This chapter builds upon the paper *The Winning Formula: Canadian State Trading Cultural Identity for Commercial Partnerships*, that I coauthored with Michèle Martin and which was presented at and published through the International Conference *The Impacts of Information and Communications Technologies on Social Realities*, Barcelona, 18 May 2000.

²⁸ Although they use the term Internet clusters in their research, it included the same ICT industries as discussed in this study.

1987; Menzies, 1996 & 1998; Bernard & Shniad, 1998) of labour, I am more concerned by the actual process of the *creation* of the high-technology labour force in Quebec and Montreal. In particular, the discussion concentrates on the changing nature of education as a cultural and economic institution.

Education: A Cultural & Economic Institution

The focus on education is important, as traditionally this institution has been rooted upon a balance between, on the one hand, a process of cultural socialization in the sense of passing on, from generation to generation, the socio-cultural history, values and referents of society which, historically, has been demarcated along local or regional lines,²⁹ and on the other hand, a key institution of economic socialization - i.e. preparing citizens for the labour force. Depending on particular societies this balance can be of different ratios. In Quebec, historically, this balance has been asymmetric, with the socio-cultural aspect figuring predominantly.

The reason for the predominance of the socio-cultural aspect is that the French-speaking Quebecois culture represents a small minority culture in the large,

²⁹Education in Canada is not a federal but a provincial issue, with many key decisions coming down to municipalities or regions. This demonstrates the practical application of philosophy of education being rooted in the local, rather than the national or global. This brings up a crucial yet under-theorized issue: with economic globalization and the emergence of the knowledge-based economy the nature and role of education is changing - i.e. being uprooted from its local traditions and placed into the context of the global, knowledge-based, digital economy. While the scope of this paper limits such an investigation, I feel this is an important issue that scholars and governments alike should examine closely and critically. The purpose here is to look at a particular manifestation of this phenomenon: Quebec and Montreal.

Anglophone, and now media saturated, North America. In response to the threat of cultural irrigation via English-speaking Canada and the United States, the province of Quebec developed a strategy of *cordon sanitaire*, erected by the ruling classes after the English Conquest in 1763 to protect the Francophone population from any foreign influence likely to contribute to the disappearance of its culture. The *cordon sanitaire* was at its peak in the 1970s with the enactment of Bill 101 (1977) by the separatist provincial government, a bill drawn to protect the existence of French culture in proclaiming the province of Quebec as a unilingual French-speaking territory, thus contravening the clause of the Canadian Charter which makes Canada officially bilingual (Martin & Ivis, 2000).

Bill 101, also known as the Charter of the French Language, is intended to protect and promote the French language in Quebec. It stipulates that French is the official language of the province, and is required to be spoken within the legislature and courts, civil administration, semi-public agencies and labour relations (i.e. within the workplace) (Quebec, 1977). Among the most notable of these stipulations, however, include the requirement for the francization of the workplace, the exclusive use of French on commercial and road signs, and limited accessibility to English schools (Alliance Quebec, ND).

With respect to the francization of the workplace:

In 1997, when Bill 101 was introduced, there was great concern for the quality and quantity of work being done in French in Quebec. The Gendron Commission had reported in the 1960s that 82% of all written

communication in Quebec was in English.

Under Bill 101, all companies operating in Quebec with fifty or more employees are required to function in French. They must have a "francization certificate" to prove that they are doing this. When Bill 101 was introduced, most companies were given four years to comply.

The use of the French language in the workplace has increased dramatically over the past 20 years (Alliance Quebec, ND).

The Sign Law, under Bill 101, required that all commercial and road signs in the province of Quebec be in French only. This hard-line stance was slightly eased in the early 1990s when the Liberal government in Quebec implemented amendments to the Sign Law, allowing for the limited use of other languages on signs, as long as French was predominant (Alliance Quebec, ND).

One of the major objectives of Bill 101 was to limit access to English schools. As such, the *cordon sanitaire* became a prominent feature of the education system, in an attempt to reverse the long-standing tradition of English school attendance for the children of some Anglophone and all Allophone immigrants (Alliance Quebec, ND). In order for the parents to enrol their child in an English school, they must first obtain a *Certificate of Eligibility* issued by the ministère de l'Éducation, thereby conforming with the requirements of Bill 101. Eligibility for English school instruction is demarcated in Chapter VIII of *La Charte de la langue française*:

72. Instruction in kindergarten classes and in the elementary and secondary schools shall be in French, except where this chapter allows otherwise...

73. The following children, at the request of one of their parents, may receive instruction in English:

(1) a child whose father or mother is a Canadian citizen and received elementary instruction in English in Canada, provided that that instruction constitutes the major part of the elementary instruction he or she received in Canada;

(2) a child whose father or mother is a Canadian citizen and who has received or is receiving elementary or secondary instruction in English in Canada, and the brothers and sisters of that child, provided that that instruction constitutes the major part of the elementary or secondary instruction received by the child in Canada;

(3) a child whose father and mother are not Canadian citizens, but whose father or mother received elementary instruction in English in Québec, provided that that instruction constitutes the major part of the elementary instruction he or she received in Québec;

(4) a child who, in his last year in school in Québec before 26 August 1977, was receiving instruction in English in a public kindergarten class or in an elementary or secondary school, and the brothers and sisters of that child;

(5) a child whose father or mother was residing in Québec on 26 August 1977 and had received elementary instruction in English outside Québec, provided that that instruction constitutes the major part of the elementary instruction he or she received outside Québec (Quebec, 1977l).

It follows that the education system in Quebec has become an integral part of the *cordon sanitaire*. Education has been a primary vehicle by which the Quebec government has sought to fight against the encroaching Anglophone North American culture, thereby maintaining its French-speaking Quebecois culture.

The following discussion outlines how, with the development and implementation of the new economic imperative in Quebec, the socio-cultural based education system is being transformed. The balance is now shifting away from socio-

cultural values towards an economic rationality. In short, the Quebec education system can be viewed as going from a system based on the production of the culturally enriched citizen, to the production of economic units necessary for the vacuum of the high-technology labour market. To examine how the provincial labour market strategy is linked to the education system, I intend to highlight three key issues: the ascension of economic rationality in labour market policy, the institutionalization of a scientific culture, and the institutionalization of English in the education system. It is important to point out that this examination, for the most part, focuses on primary and secondary education. This is a relatively under-examined dimension of this issue, as most research analyses post-secondary education and advanced research.

The 21st Century Labour Force: Reconstituting the Education System in Quebec

The Ascension of Economic Rationality in Education & Labour Market Policy

Innovation within the ICT sector is built around a highly-skilled workforce that is on the 'cutting-edge' of developments within the domains of computers, telecommunications and electronics. As noted repeatedly by the popular media and by private industry, there exists a serious deficiency in the production of qualified labour needed to feed this process. In turn, public education has become a key area of debate concerning the production of qualified labour. Consequently, "[M]any high-tech employment strategies focus on revamping the

public role of education. The main thrust of these initiatives is to push for greater public and private funding of maths, science, and computer education in primary and secondary schools, and electrical engineering and computer science education in universities" (Weiss, 1985: 89). This, in the view of business, would solve the deficiency problem and thus constitutes the appropriate course of action, considering the changing contours of the economy.

However, whereas employers are insisting that post-secondary institutions vastly increase the supply of computer scientists and engineers, organizations such as engineering and computer science associations are less enthusiastic about such an undertaking (Weiss, 1985: 85). The associations urge that the issue here does not concern the dire need for qualified workers but rather, it concerns the issue of control. In essence, the battle is over the supply-demand imbalance which, tipped either way, can provide leverage over job security and wages for either the employer or employee. To date, the supply-demand imbalance with respect to highly-skilled labour has been in favour of labour. As such, labour has been able to garner well paid jobs with relatively decent working conditions (Weiss, 1985: 84).

In turn, business has put pressure on provincial and local authorities to increase the supply of this dimension of the labour force. By doing this, capital is applying a 'strategic logic' - which translates into the idea that by increasing, or rather by flooding the labour market with high-skilled labour, they will be able to gain the

advantage in the supply-demand imbalance and, along with it, the control over wages and working conditions.

While for different yet related reasons than those of the private sector - i.e. to build a stronger economy, attract foreign investment, create jobs - the Quebec government has aligned itself with the concerns of business, accepting the fact that there is the need to rapidly produce qualified and affordable labour. This is paramount to attracting globally mobile high-technology capital and, as alluded to in a previous chapter, this strategy also correlates with the socio-political goals of the local Montreal authorities: to construct Montreal into a middle-class population of white collar workers (Léveillé & Whelan, 1990: 164-165). What better candidates for this urban utopia than engineers and scientists from the ICT sector?

The Quebec government, therefore, has fully adopted, and is in the process of implementing *the new economic imperative*. To do so, it has identified making "the educational system more responsive to changing demands for labour skills" in order "to develop a skilled and adaptable labour force" as a paramount objective (Johnson, 1994: 259). Following from this economic-based rationality, the Quebec authorities have begun to synchronize its labour market strategies with its industrial strategy (Johnson, 1994: 260). Thus the logic of the market is permeating into Quebec's educational system, shifting the aforementioned balance towards the goal of economic socialization.

Producing a Technological Culture

A key nodal point in this process occurred in 1997, at which time the provincial government created the Council of Science and Technology (CST). The CST's mandate is to develop a policy of innovation that predominantly serves to support the expansion of science and technology and to guide the formation of the manpower required by this sector's expansion. An essential and specific tenant of the CST's mandate is to evaluate the place of science and technology in primary and secondary schools (Martin & Ivis, 2000; 1999).

The CST produced a report in 1998, *Science and Technology for Schools*, which assigned a 'double function' to the education system. First, the system should create the scientists and engineers required for the expansion of the new economy in Quebec and, second, it should initiate, educate and instill, in each citizen, a sensibility of the importance of science and technology as well as the way in which it operates (Quebec, 1998f). As such, the CST has recommended that new programs be created to revitalize and to raise awareness of the importance of the sciences, which are currently insufficiently treated subjects in primary and secondary schools.

Moreover, the CST's report suggests that the government should allocate funds immediately in order to begin a program aimed at instructing teachers so that they can instill a "pedagogical approach that begins right from the beginning of primary school" (Quebec, 1998g). The overarching goal of this program is thus

to cultivate an environment in which children can grow up already accustomed to the exploitation of technology.

As one would suspect, industry representatives such as APMQ (L'Association des producteurs de multimédia du Québec) and CESAM (Centre d'expertise et de services en application multimédia) approve of the CST's conclusions and wholeheartedly support its recommendations. The reason the industries are so supportive of the CST's conclusions is that, for them, it is essential for the educational system to introduce and incorporate what Michel Normandin, an executive at Locus Dialogue in Montreal, calls "the project of a technological culture" (Interview, 1999b: Normandin). With regards to the cultivation of a technological culture, to date, "only Quebec has developed a jurisdictional vision at the post-secondary level" (CMEC, 1997).

One of the results of these developments has been the implementation of a curriculum that has increased the number of hours for science and technology education at all levels of schooling. The objectives of this program is three-fold: to encourage youth to pursue scientific or technological employment; to ensure a constructive and ongoing relationship between the education system and industry; and, to promote the understanding of the intricate workings of enterprise to the youth in Quebec in order to develop better business strategies (Quebec, 1998g). Thus this program aims to cultivate and extend the hegemony of economic market culture into education, and *not* to develop the analytical

skills that permit critical analysis of the diverse social, cultural and political properties that are inherent in a democratic and egalitarian society (Martin & Ivis, 2000). An industrial culture, based on the pursuit of market objectives, appears to be found on the opposite end of such a spectrum.

The objectives of the provincial and local authorities regarding this issue are therefore closely aligned with those of industry, demonstrating that the logic of the market has permeated into the public institution of education. In their attempt to implement the new economic imperative, the provincial government has focussed on education as a key driver in the development of high-technology clusters. The result of this being that the government has institutionalized capital's vision as official labour policy.

Institutionalizing Bilingualism in Schools: English as the International Language of Business

At the heart of the Quebecois culture is the French language, as Louise Beaudoin, Minister of International Relations and minister responsible for the *Charter of the French Language*, recently stated, language is "the cornerstone of our culture" (Quebec, 2000g). Accordingly, language is at the centre of the *cordon sanitaire* and its importance is evident in the implementation of Bill 101, the bill that contravenes the Canadian Charter to make Quebec a unilingual French-speaking territory. The development of high-technology clusters in Montreal, and the corresponding economic rationality employed to facilitate the

development of these industries and technologies, runs contrary to this traditional socio-cultural position in Quebec and, consequently, is beginning to challenge its ability to protect the French-language Quebecois culture. A primary way in which this is happening is through the institutionalization of English in the Quebec school system, an institution that, historically, has been a strong hold of the *cordon sanitaire*. Moreover, this process is occurring most predominantly in Montreal, the province's largest urban centre and economic hub.

The reason for this development is not complex. High-technology industries are international in nature and, as such, are built upon the premise that they are export oriented businesses. This is especially true in Canada, where a small domestic population and economy limit the country's potential 'economic/technological absorption'. In turn, the real market is the international market, which is mostly directed towards the United States. In general, eighty-six percent of all Canadian trade is with the United States, and in the case of many of the high-technology companies in Montreal this number reaches 100% (Interview, 1999b: Normandin). Thus, in order to leverage the potential of the new economy, Quebec must open its borders to the global economy, especially the American economy. The result, quite simply then, is that English is the "lingua franca of science technology and commerce" (Burelle, 2000). In that context, the growth of high-technology clusters in Montreal relies on the formation of English-speaking workers.

This creates an interesting situation: for Quebecers's to exploit the employment potential created through the provincial and local governments' strategy of implementing the *new economic imperative*, they must become bilingual.

Quebec must allowing English to become a more prominent feature of society if it wishes to facilitate the growth of the ICT high-technology cluster, a linguistic invasion that it has fought, historically, in the name of cultural protection.

Nevertheless, as mentioned earlier, the Quebec government has aligned its labour market strategy with its industrial policy, and language constitutes another dimension of this strategy. In order to reconcile the demand for English-speaking workers the Minister of Education has reinforced English language curricula at the primary and secondary levels.³⁰ This constitutes a major change in curricula, considering that previously English was not required to be taken until the latter stages of high-school.

Interestingly, the first movements towards these significant changes to the education system corresponded with the appointment of a recognized and prominent businessman, François Legault, as the head of the educational ministry. Legault's background is not quite what one would expect as an education minister. Legault was the director of marketing for Québecair, co-founder of Air Transat and has been on the Boards of many prominent Quebec

³⁰For more detailed discussion on this issue please see "Reaffirmer L'école," Quebec: Ministère de l'éducation du Québec, 1997b.

companies. Moreover, before taking on the portfolio of Education, Legault was the Ministère de l'Industrie, du Commerce, de la Science et de la Technologie (Quebec, 2000h). This clearly demonstrates the logic, vision and position of Lucien Bouchard, Premier of Quebec, with respect to this issue: the government intends to reconcile the role of education with the needs of the new economy and high-technology industries.

These developments have not occurred in a vacuum, however. They have raised serious concerns and caused much debate both from within and outside the Quebec government. The basis for the debate is the contradiction in policy objectives implemented by the Quebec government. On the one hand, there is a long tradition of socio-cultural policies that have been put in place to protect the French-language Quebecois culture. Further, these socio-cultural policies constitute the pillars on which the separatist government has built its political platform and garnered its popular support. On the other hand, the same government is allocating a tremendous amount of resources towards an economic agenda that, if successful, holds the potential to irrigate the Quebecois culture in as little time as a single generation. The clearest and most telling manifestation of this debate, and the focus of the rest of this chapter, is between the Ministère de la Culture and the Ministère de l'Industrie.

Competing Discourse & The Politics of Language, Culture & Economy

As discussed throughout this chapter, language is an important cultural, political,

and now economic issue in the province of Quebec. With the advent of high-technology clusters in Montreal and the parallel process of economic globalization via increasing foreign direct investment, concerns over the integrity of the French-language, especially with respect to its use in the private sector, have been raised.

Canada is officially bilingual as set out in the *Official Languages Act*. As such, all government institutions have the mandate to provide materials in both French and English (although, as discussed earlier, Bill 101 contravenes this *Act* and proclaims Quebec as unilingual. Nevertheless, the province does provide information and services in both languages). The ICT industries, as communication and distribution systems are locked into the global, not provincial economy, and thus pose a challenge to the provision of materials in both official languages. While the problems associated with this challenge are tackled in the public sector, the private sector is constantly overstepping the barriers established by Bill 101. This situation has led the provincial government into action (Martin & Ivis, 2000).

In 1996 the Ministère de la Culture of Quebec formed the Commission de la Culture with the mandate of investigating the state of French language and culture in the province. The findings of the report caused alarm, stressing that the use of French, the language at the heart of the Francophonie, is decreasing in the province, particularly in Montreal where institutionalized bilingualism has

increased, especially in the private sector. To halt the irrigation of the French-language in the Quebecois culture, the commission proposes to reinforce the measures stipulated in Bill 101 (Martin & Ivis, 2000).

At the same time, however, another provincial government strategy, initiated by the Ministère du Commerce et de l'Industrie and aimed at stimulating foreign capital investment, was employed to encourage the marginalization of some of the measures of Bill 101. Indeed, the Quebec government has suspiciously and surreptitiously introduced a clause to Bill 101 which effectively removes the high-technology industries from some of the bill's stipulations (CBC, 1998). It seems then, that the Ministère du Commerce et de l'Industrie has sided with the vision put forth by Industry Canada in recognizing English as the language of international business within the high-technology industries, a position directly at odds with the preoccupations of the Ministère de la Culture at the provincial level. This is an interesting and historically significant shift with respect to political alignment in Canada. Traditionally, and especially in Quebec, political alignment has been horizontal - i.e. it has occurred along provincial lines in an adversarial position to the federal government. However, on issues related to the implementation of the new economic imperative and the development of the new economy, political alignment has manifested vertically - i.e. the federal Ministry of Industry and the Ministère du Commerce et de l'Industrie in the province of Quebec share the same vision, in opposition to the Ministry of Heritage at the federal level and the Ministère de la Culture at the provincial

level.

The practical manifestation of competing discourses at the provincial level recently played itself out in a court case regarding the mandatory use of French language software. The court decided that “the province's language law does not permit the Office de la langue Française (OLF) - the provincial language watchdog (popularly referred to as the language police) - to force businesses operating in the province to use French-language software” (Marotte, 2000b: B6). The Language Minister, Louise Beaudoin, stated that the government will not appeal the decision. While this example clearly demonstrates that there are competing discourses on this issue within the Quebec government, it also illustrates that the economic rationality or discourse now carries more influence than the socio-cultural discourse that, historically, has predominated in Quebec.

Therefore, “in the province of Quebec, despite some serious concerns raised by the Ministère de la Culture, it seems that the purpose of the *cordon sanitaire* has shifted from one of protecting French-speaking Quebecois against the English language invasion, to one of guarding the high-technology industries against the French language culture” (Martin & Ivis, 2000). As such, the mechanism protecting the socio-cultural, educational, and linguistic dynamics specific to the Francophone society in Quebec are increasingly becoming subject to the mercy of multinational corporations settling in the province and painting an enticing picture of the new economy and new economic imperative, which are based on

activities largely related to the use of high-technology. This market logic entails little if any reference to a socio-cultural logic. In sum, the economic, educational, and linguistic conditions granted by the provincial government to the high-technology industries represent, essentially, a historical rupture with the role of the state in preserving the cultural and social capital of the Quebec society (Martin & Ivis, 2000).

VIII. Conclusion: The New Economy in Canada

This research study has outlined the process by which the new economy, and the discourse employed to perpetuate it, has ascended to the position of the new economic imperative in Canada, and has examined some of its impacts through the case study of Montreal. In particular, my research has outlined how the Quebec government has employed an economic rationality rather than cultural considerations to guide the formation of public policy in the attempts to facilitate the development of high-technology clusters. These public policy decisions, driven by a purely economic rationality, are reconfiguring urban spaces into post-industrial economic spaces, which in turn, are impacting the everyday political and cultural lives of people. These impacts are felt in areas such as language, education and labour.

An essential part of my research included providing a broad political and economic historical context to this subject, an aspect that generally has been overlooked and/or neglected in mainstream accounts of the emergence of the new economy. By examining how the ICT industries came to be regulated under an economic agreement (WTO) rather than by political (UNESCO) and/or technical (ITU) institutions, this study illustrated how the ICT industries underwent a fundamental conceptual transformation: from being engaged, understood and regulated as a national public utility, to that of a global commodity service.

My study unveils how political and economic pressures, based on the goal of maximizing economic investments across space, have been instrumental in shaping the environment that is now commonly referred to as the global, knowledge-based or digital economy. In short, this discussion underscored that today's dynamic environment is not merely the evolution or manifestation of new technological developments, but also the result of decades of political and economic struggles. There is a rich political and economic history of augmentation, implementation, and use of new technologies, all central factors in shaping the new economy and the new economic imperative in Canada.

By providing this historical context, my research also illustrated that the specific discourse surrounding the new economy, information economy, and/or global knowledge-based economy has been an integral element of Canada's science and ICT policy discourse for over thirty years. The project of creating the new economy, therefore, has been underway for quite a while, and has undergone many iterations. The work of the Science Council of Canada and the Department of Communications, as well as failure of TELIDON, are prime examples of this.

My analysis also stresses how the increasing mobility of capital, augmented by rapid technological developments in the areas of ICTs and transportation, is having demonstrable ramifications with respect to the balance of power in the relationship between capital and the state. The ability of capital to

decompartmentalize or divide-up their production processes, and then rearticulate it in various combinations across the globe, has increasingly reduced the role of the state to a facilitator of capital investment. Consequently, the focus of state activities is becoming less directed towards regulating capital, and more directed towards constructing a conducive and amenable environment for foreign capital investment and accumulation.

This pressure has been intensified by the fact that the creation of high-technology clusters has become the mainstream, neo-liberal approach to the development of the new economy. This has resulted in fierce competition between national, regional and local authorities to attract and retain global high-technology investment. This competition between governments translates into an extremely powerful lever for capital in its relationship with different levels of government. Consequently, national, regional and local authorities are increasingly giving priority to the implementation of economic policy agendas, often at the expense of socio-cultural policy goals, in the hope of attracting these firms.

A clear example of this process was provided through the case study of Quebec and Montreal. The provincial and local governments are vigilantly implementing the new economic imperative, as is visibly evident in the massive infrastructure projects of the Cité du Multimédia and E-Commerce Place and the extensive tax credit regime that accompanies these projects. While these projects represent

explicit manifestations of the impacts that the new economic imperative is having on space and governance (via the allocation of resources), this study also explicates some of the implicit ramifications which this process is having on education, language and culture.

Quebec, in an attempt to appease the growing demands of globally mobile high-technology firms and to ensure its position as a nodal point on the global corporate network, has implemented an economic rationality to its education system, traditionally a strong hold of the *cordon sanitaire*. This demonstrates one of the most important findings of this research paper: for Quebec to leverage the potential of the new economy and the vast investment it has made to create a conducive business environment for high-technology investment, it must open its borders to the flow of global capital, information, culture and ideas, something that the province has historically fought against in the name of cultural integrity and sovereignty. This appears to be a "catch-22" for the province, for while it wants to solidify its own economy and become a self-sustaining political-economic entity, it has to compromise some of the socio-cultural elements which, historically, have been the key ingredients with respect to the province defining itself as distinct. This contestation is evident in the contradictory policy goals as set out by Bill 101, which are being implemented by Louise Beaudoin, the Minister responsible for enforcing the *Charter of the French Language*, and the new economic imperative, which is being implemented by Bernard Landry, the province's Finance Minister.

Thus by examining provincial and local practices, this study has unveiled some of the wider social, cultural and political impacts that the implementation of the new economic imperative is having on people's lives. Moreover, it has shown the utility of applying spatialization as an entry point to researching this issue. By investigating the spatial mobility of capital, the spatial convergence of business processes and the shifting balance of power between capital and the state, this research has illustrated how the creation of high-technology clusters, the mainstream, neo-liberal perspective being applied to bolster the development of the new economy, is creating a new economic geography. This new economic geography is altering the spatial conditions of capital accumulation and, consequently, the relationships between capital and the state, capital and labour and the state and labour, all in favour of capital.

In sum, the general aim of my research has been to bring to the fore some of the social, cultural, political and economic impacts that are associated with the development of the new economy in Canada, which are often overlooked due to the application of a strictly economic or technocratic perspective. It is imperative to relay, however, that by no means does this study assert to be finite. While it does examine and uncover many important dimensions of this issue, it does not encompass the entire scope of the subject, nor does it exhaustively deal with all the topics discussed herein. Therefore, while this study aims to contribute to the future development of Canadian society, it does so primarily with the hope of being a stepping stone towards a broader and more robust discussion regarding

the new economy in Canada.

REFERENCES

- Alliance Quebec. (ND). "Bill 101." www.aq.qc.ca/English/qsiglaw.htm.
- Aronowitz, Stanley and William DiFazio. (1994). The Jobless Future: Sci-tech and the dogma of work. Minneapolis: University of Minnesota.
- Aronowitz, Stanley. (1988). Science as Power: Discourses and Ideology in Modern Society. Minneapolis: Minnesota Press.
- Australia. (2000). E-commerce Beyond 2000. Canberra: Commonwealth of Australia.
- Babe, Robert E. (1990). Telecommunications in Canada. Toronto: University of Toronto.
- Baran, Paul and Paul Sweezy (1966). Monopoly Capital. New York: Monthly Review.
- BCNI (Business Council on National Issues). (2000). "Winning the Human Race: Developing and retaining world class talent (Working Paper)." Ottawa: BCNI: April 5.
- Bernard, Elaine and Sid Shniad. (1998). "Fighting Neoliberalism in Canadian Telecommunications." Capitalism and the Information Age: The Political Economy of the Global Communication Revolution. (Eds.) R.W. McChesney, E.M Wood & J.B. Foster. New York: Monthly Review Press: 165-178.
- Boyd-Barrett, Oliver. (1995). "The political economy approach." Approaches to Media. London: Arnold: 186-192.
- Burelle, Andre. (2000). "Why we need Bill 101: Language charter represents a basic democratic compromise to ensure French survives in Quebec." Montreal Gazette. 4 July: Op-ed.
- Cairncross, Frances. (1997). The Death of Distance: How the communications revolution will change our lives. Boston: Harvard.
- Canada. (1998). The Canadian Electronic Commerce Strategy. Ottawa: Government of Canada.
- Canada. (1996a). Science and Technology for the New Century (Summary). Ottawa: Government of Canada.

- Canada. (1996b). Highlights of Departmental S&T Action Plans in Response to Science and Technology for the New Century. Ottawa: Government of Canada.
- Canada. (1996c). Science and Technology for the New Century: A Federal Strategy. Ottawa: Government of Canada.
- Canada. (1996d). Industry Portfolio's Action Plan: Science and Technology for the New Century. Ottawa: Government of Canada.
- Canadian Press. (2000). "Quebec's e-commerce project draws fire: critics say government is unfairly giving favours to a particular niche." Globe & Mail. 29 May: B5.
- Canadian E-Business Opportunities Roundtable. (2000). Fast Forward: Acceleration Canada's Leadership in the Internet Economy. Toronto: BCG.
- CBC (The Canadian Broadcasting Corporation). (1998). "The High-Tech in Quebec." Venture. October 13.
- CMEC (Council of Ministers of Education, Canada). (1997). "Development in Information Technologies in Education." Presented at the thirteenth conference of the Commonwealth Education Ministers, Botswana. July 28-August 1.
- Davies, Andrew. (1994). "Restructuring the national monopolies." Telecommunications and Politics: A decentralised Alternative. New York: St. Martin's: 147-178.
- Department of Communications (DOC), Shirley Serafini and Michel Andrieu. (1981). The Information Revolution and its implications for Canada. Ottawa: Minister of Supply and Services.
- Department of Communications (DOC). (1979). Telecommunications and Canada Consultative Committee on the Implications of Telecommunications for Canadian Sovereignty. Ottawa: Minister of Supply and Services.
- DeVol, Ross C. (1999). America's High-Tech Economy: Growth, development, and risks for metropolitan areas. Santa Monica: Milken Institute.

- DFAIT (Department of Foreign Affairs and International Trade). (1997). "Information Technology Agreement Opens Door to Trade." CanadExport On-Line. 14 July: <http://dfait-maeci.gc.ca/english/news/newsletr/canex/970714ce.htm>.
- Dowler, Kevin. (1996). "The Cultural Industries Policy Apparatus." The Cultural Industries in Canada. Michael Dorland (ed.). Toronto: James Lorimer & Company: 328-346.
- Drake, William J. & Eli Noam. (1997). "The WTO deal on basic telecommunications: Big bang or little whimper?" Telecommunications Policy. Vol. 2, No 9/10. London: Pergamon: 799-818.
- Drake, William J. (1994). "Asymmetric Deregulation and the Transformation of the International Telecommunications Regime." Asymmetric Deregulation: The Dynamics of Telecommunications Policy in Europe and the United States. Norwood, NJ: Ablex: 137-203.
- Drucker, Peter. (1999). "Beyond the Information Revolution." Atlantic Monthly. Oct.: <http://www.theatlantic.com/issues/99oct/9910drucker.htm>.
- Dunn, Hopeton S. (1995). "Caribbean telecommunications policy: fashioned by debt, dependency and underdevelopment." Media, Culture & Society. Vol. 17. London: Sage: 201-222.
- Ebden, Theresa. (2000). "Report slams Montreal tech park." Globe & Mail. 29 June: B5.
- EDE (Economic Development Edmonton). (1999). Greater Edmonton Competitiveness Strategy. Edmonton: EDE.
- Elliot, Larry. (1999). "Capitalism: running on empty." Guardian Weekly. 16-22 Dec: 14.
- Feagin, Joe R. And Michael Peter Smith. (1987). "Cities and the New International Division of Labour: An overview." The Capitalist City: Global restructuring and community politics. (Eds.) M. P. Smith & J. R. Feagin. Cambridge, MA: Basil Blackwell: 3-36.
- Ferguson, Marjorie. (1990). "Electronic Media and the Redefining of Time and Space." Public Communications: The new imperatives. London: Sage.

- Ferguson, Marjorie. (1986). "The challenge of neo-technological determinism for communications systems, industry and culture." New Communication Technologies and the Public Interest: Comparative perspectives on policy and research. (Ed.) Marjorie Ferguson. London: Sage: 52-70.
- Forester, Tom. (1987). High-Tech Society: The story of the information technology revolution. Cambridge, MA: MIT Press.
- Gibbens, Robert. (2000). "Montreal developers castigate subsidies." Financial Post. 29 June: C5.
- Giddens, Anthony. (1990). The Consequences of Modernity. Stanford: Stanford University.
- Gillies, Donald J. (1990). "Technological Determinism in Canadian Telecommunications: Telidon Technology, Industry and Government." Canadian Journal of Communication. Vol. 15, No. 2: 1-15.
- Giri, Ananta Kumar. (1995). "The Dialectic Between Globalization and Localization: Economic Restructuring, Women and Strategies of Cultural reproduction." Dialectical Anthropology. 20: 193-216.
- Graham, Stephen and Simon Marvin. (1996). Telecommunications and the city: Electronic spaces, urban places. London: Routledge.
- Glickman, Norman. (1987). "Cities and the International Division of Labour." The Capitalist City: Global restructuring and community politics. (Eds.) M. P. Smith & J. R. Feagin. Cambridge, MA: Basil Blackwell: 3-36.
- Godfrey, David & Ernest Chang. (1981). The TELIDON Book. Toronto: Press Porcépic.
- Goldberg, Carey. (1999). "Across the Country, Universities Generate a High-Tech Economic Boom." New York Times: Fri. 8 Oct.
- Golding, Peter and Graham Murdock. (1991). "Culture, Communications, and Political Economy." Mass Media and Society. (Eds.) J. Curran and M. Gurevitch. London: Edward Arnold: 11-30.
- Greater Quebec Economic Development Corporation. (2000). Information Technology Products. Quebec: Greater Quebec Economic Development Corporation.
- Guinet, Jean. (1999). "Introduction." Boosting Innovation: The Cluster Approach. Paris: OECD: 7-8.

- Gunkel, D.J. and A.H. Gunkel. (1997). "Virtual Geographies: The new worlds of cyberspace." Critical Studies in Mass Communication 14: 123-137.
- Hamelink, Cees. (1994). "Development." The Politics of World Communication. London: Sage: 196-227.
- Harvey, David. (1990). The Condition of Postmodernity: An enquiry to the origins of cultural change. Cambridge, MA: Blackwell.
- Hayes, Ronald F. (1973). The Chaining of Prometheus: evolution of a power structure for Canadian science. Toronto: University of Toronto.
- Heath, Roger. (1999). "The Ottawa High-tech Cluster: Policy or Luck?" Boosting Innovation: The Cluster Approach. Paris: OECD: 175-193.
- Henderson, Angus & Fiona Nott. (1997). "WTO Global Telecommunications Deal." Gilbert & Tobin Law Firm.
<http://www.gtlaw.com.au/pubs/wtoglobal.html>.
- Herman, Edward S. and Robert McChesney. (1997). The Global Media: The new missionaries of global capitalism. London: Cassell.
- Hilner, Jennifer. (2000). "Venure Capitals." Wired. Vol. 8, No. 7: July.
- Holbrooke J. A. D. & L. P. Hughes. (1997). Measurement of Regional Systems of Innovation: Innovations in Enterprises in British Columbia. Vancouver: Centre for Policy Research on Science and Technology.
- Industry Canada. (1999). "Connecting Canadians Initiative."
<http://connect.gc.ca/en/100-e.htm>.
- Industry Canada. (1998a). Technology Partnerships Canada: Annual Report 1997-1998: Investing in Innovation. Ottawa: Government of Canada.
- Industry Canada. (1998b). Industry Canada: Making a Difference: Our Priorities for 1998-1999. Ottawa: Government of Canada.
- Industry Canada. (1995a). The Information Economy in Canada Facts Sheet. Ottawa: Government of Canada.
- IHAC (Information Highway Advisory Council). (1997). Preparing Canada For a Digital World. Ottawa: Government of Canada.

IHAC (Information Highway Advisory Council). (1995). Connection, Community, Content: The Challenge of the Information Highway. Ottawa: Government of Canada.

Interview. (1999a). Frank Vitsentzatos, Apollo Microwaves Ltd. Feb. 23.

Interview. (1999b). Michel Normandin, Locus Dialogue. Feb. 25.

Joint Venture: Silicon Valley Network. (1999). Internet Cluster Analysis. Silicon Valley: Joint Venture: Silicon Valley Network.

Johnson, Andrew F. (1994). "Towards a Neo-corporatist Labour Market Policy in Quebec." Continuities and Discontinuities: The political economy of social welfare and labour market policy in Canada. (Eds.) Andrew F. Johnson, Stephen McBride & Patrick J. Smith. Toronto: University of Toronto: 253-267.

Kotabe, Masaaki & K. Scott Swan. (1998). "The Role of Strategic Alliances in High-Technology New Product Development." Trends in International Business: Critical perspectives. Malden, MA: Blackwell.

Joint Venture: Silicon Valley Network. (1999). Internet Cluster Analysis. Silicon Valley: Joint Venture.

Lash, Scott and John Urry. (1994). Economies of Signs and Space. London: Sage.

Léveillé, Jacques and Robert K. Whelan. (1990). "Montreal: The struggle to become a "world city." Leadership and Urban Regeneration: Cities in North America and Europe. Vol 37. *Urban Affairs Annual Reviews*. (Ed) D. Judd and M. Parkinson. Newbury Park, CA: Sage: 152-170.

Markusen, Ann. (1985). "High-tech jobs, markets and economic development prospects: Evidence from California." Silicon Landscapes. (Eds.) Peter Hall & Ann Markusen. Boston: Allen & Unwin: 35-48.

Marotte, Bertrand. (2000a). "Quebec aims to build 'James Bay' of e-commerce." Globe & Mail. 25 May: T5.

Marotte, Bertrand. (2000b). "Quebec won't appeal ruling on non-French software." Globe & Mail. 22 June: B6.

- Martin, Michèle & Matthew Ivis. (2000). "The Winning Formula: Canadian State Trading Cultural Identity for Commercial Partnership." Paper presented at the International Conference: *Impacts of Information and Communication Technologies on Social Realities*. Barcelona: 18 May.
- Martin, Michèle. (1991). Hello Central: Gender, Technology and Culture in the Formation of Telephone Systems. Montreal: McGill-Queens' University Press.
- Massey, Doreen. (1984). "Introduction: Geography matters." Geography Matters! (Eds.) Doreen Massey & John Allan. New York: Cambridge: 1-11.
- Mattelart, Armand. (1994). Mapping World Communication. Susan Emmanuel and James A. Cohen (Trans.). Minnesota: University of Minnesota Press.
- McMurchie, Laura Lune. (1999). "Location, location, location." Infosystems Executive. December: 28-35.
- Meehan, Eileen R., Vincent Mosco, and Janet Wasko. (1993) "Rethinking Political Economy: Change and Continuity." Journal of Communication 43(4), Autumn: 105-116.
- Melman, Seymour. (1970). Pentagon Capitalism: The political economy of war. New York: McGraw-Hill.
- Menzies, Heather. (1998). "Challenging Capitalism in Cyberspace: The information highway, the postindustrial economy, and people." Capitalism and the Information Age: The Political Economy of the Global Communication Revolution. (Eds.) R.W. McChesney, E.M Wood & J.B. Foster. New York: Monthly Review Press: 169-86.
- Menzies, Heather. (1996). The Brave New World: The information highway and the new economy. Toronto: Between the Lines.
- MIT (Massachusetts Institute of Technology). (1997). The Impact of Innovation. Cambridge: MIT Press.
- Montreal International. (2000). "Action Internationale." Leadership Montreal. Montreal: Board of Trade of Metropolitan Montreal.
- Montreal International. (1998a). Promotional CD. Information can also be found on their website: www.montreal-intl.com.

- Montreal International. (1998b). Brochure: "Montreal's Underground City: Vocation of a Metropolis.
- Mosco, Vincent. (1999). "New York.Com: A Political Economy of the "Informational City." The Journal of Media Economics 12(2): 103-116.
- Mosco, Vincent. (1996). The Political Economy of Communication: Rethinking and renewal. London: Sage.
- Mosco, Vincent and Andrew Reddick. (1997). "Political Economy, Communication, and Policy." Democratizing Communication: Comparative Perspectives on Information and Power. (Eds.) Mashood Bailie and Dwayne Winseck. Cresskill, NJ: Hampton: 11-32.
- Murdock, Graham. (1990). "Redrawing the Map of the Communications Industries: Concentration of ownership in the era of privatization." Public Communications: The new imperatives. London: Sage.
- Munroe-Blum, Heather. (2000). Growing Canada's Innovation System: The Strategic role of University Research. University of Toronto: Toronto.
- Netherlands (Letter from the Minister of Economic Affairs to the Speaker of the Second Chamber of Parliament). (1997). Opportunities Through Synergy: Government and the emergence of Innovative Clusters in the Private Sector. The Hague: Netherlands.
- OECD (Organization of Economic Cooperation and Economic Development). (2000). Electronic Commerce: Impacts and Policy Challenges. Paris: OECD.
- OECD (Organization of Economic Cooperation and Economic Development). (1998). The Social and Economic Impacts of Electronic Commerce: Background paper for the OECD Ottawa Ministerial conference "A borderless world; realizing the potential of electronic commerce". Paris: OECD.
- OECD. (1997). Dismantling the Barriers to Global Electronic Commerce: Discussion Paper. Paris: OECD.
- Petrazzini, Ben A. (1995a). "Argentina 1989-1991: Full Privatization, Limited Liberalization." The Political Economy of Telecommunications Reform in Developing Countries. Westport, CT: Praeger: 77-101.

- Petrazzini, Ben A. (1995b). "Mexico 1988-1991: A Sweeping Reform." The Political Economy of Telecommunications Reform in Developing Countries. Westport, CT: Praeger: 101-134.
- Quebec. (2000a). Québec On Line: Promoting the use of the Internet and the development of e-commerce. Quebec: Government of Quebec.
- Quebec. (2000b). "Living in Montreal - Information Technologies." <http://infostat.gouv.qc.ca>.
- Quebec. (2000c). "A German company in the Cité du multimédia." Invest-Quebec International Investment Newsletter. June, Vol. 2, No. 2.
- Quebec. (2000d). "Desjardins, Canderel and Axor announce the creation in Montreal on E-commerce Place." <http://e-economy-quebec.com/English/comm3.html>.
- Quebec. (2000e). "E-commerce Place in Montréal: 20 000 jobs within ten years." <http://e-economy-quebec.com/English/comm2.html>.
- Quebec. (2000f). "Bulletin D'Information: Introduction of the Cité du commerce électronique." 11 May. Quebec: Government of Quebec.
- Quebec, Ministère des Relations Internationales. (2000g). "Notes for an Address by Louise Beaudoin Minister of International Relations Quebec." Harvard: 7 Feb.
- Quebec. (2000h). "Monsieur François Legault, Ministère de L'Éducation (biography)." <http://www.meq.gouv.qc.ca/MINISTRE/biographie.htm>.
- Quebec, Industrie et Commerce. (1998a). "Invest in Quebec - Information Technology." http://www.infostat.gouv.qc.ca/iq/section5/5_2.htm.
- Quebec, Industrie et Commerce. (1998b). "Invest in Quebec - Foreign Investments in Quebec." http://www.infostat.gouv.qc.ca/iq/section6/6_4.htm.
- Quebec, Industrie et Commerce. (1998c). "Invest in Quebec - Corporate Taxation." http://www.infostat.gouv.qc.ca/iq/section3/3_6.htm.
- Quebec, Industrie et Commerce. (1998d). "Invest in Quebec - The Quebec Economy." http://www.infostat.gouv.qc.ca/iq/section6/6_3.htm.
- Quebec, Ministère des Finances. (1998e). Bulletin d'information - la Cité du multimédia. June 23.

- Quebec. (1998f). "Conseil de la science et de la technologie: La science et la technologie à l'école." <http://www.cst.gouv.qc.ca>.
- Quebec. (1998g). "Conseil de la science et de la technologie: Towards a Quebec Innovation Policy." <http://www.cst.gouv.qc.ca>.
- Quebec. (1997). "Science and Technology." <http://www.gouv.qc.ca/techno/technoa.htm>.
- Quebec, Ministère de l'éducation. (1997b). "Réaffirmer l'école."
- Quebec. (1977). La Charte de la langue française. <http://www.olf.gouv.qc.ca/charte/english>.
- Quebec. (1996). Doing Business In Quebec. Quebec: Government of Quebec.
- Robins, Kevin, and Andrew Gillespie. (1992). "Communication, Organisation and Territory." Understanding Information: Business, Technology, and Geography. (Ed.) Kevin Robins. London: Belhaven: 147-164.
- Roelandt, Theo J.A. & Pim den Hertog. (1999). "Cluster Analysis and Cluster-Based Policy Making in OECD Countries: An introduction to the theme." Boosting Innovation: The Cluster Approach. Paris: OECD: 9-23.
- Ross, J. S. Robert & Kent C. Trachte. (1990). Global Capitalism: The New Leviathan. Albany, NY: State University of New York.
- Sassen, Saskia. (1996). "The Global City." Readings in Urban Theory. (Eds.) Susan Fainstein & Scott Campbell. Cambridge, MA: Blackwell: 61-71.
- Science Council of Canada. (1988). Winning in a World Economy: University-Industry Interaction and Economic Renewal in Canada. Ottawa: Minister of Supply and Services.
- Science Council of Canada. (1982). Planning now for an Information Society: Tomorrow is too late. Ottawa: Minister of Supply and Services.
- Senunas, Eric. (1997). "The 1997 GATS Agreement of Basic Telecommunications: A triumph for multilateralism, or the market?" 14 Nov. http://www.bc.edu/bc_org/avp/law/st_org/ipft/articles/content/1997111401.html.

- Shniad, Sid and Charley Richardson. (1998). "Restructuring Global Telecommunications: The telephone workers' response in British Columbia." Global Productions: Labor in the making of the "information society." (Eds.) G. Sussman & J. Lent. Cresskill, NJ: Hampton: 91-110.
- Siegel, Lenny. (1998). "New Chips in Old Skins: Work and labour in Silicon Valley." Global Productions: Labor in the making of the "information society." (Eds.) G. Sussman & J. Lent. Cresskill, NJ: Hampton: 91-110.
- Smillie, Dirk. (1999). "'AskJeeves,' computer revolution will rewire global economy." The Freedom Forum Online. www.freedomforum.org/technology/1999/11/12askjeeves.asp: Nov, 12.
- Soya, Edward W. (1989). Postmodern Geographies: The reassertion of space in critical social theory. London: Vedrso.
- Sussman, Gerald and John Lent (Eds.). (1998). Global Productions: Labor in the making of the information age. Cresskill, NJ: Hampton.
- Taylor, James R. "The Twenty-First Century in the Rear View Mirror: A critique of the DOC's 1987 discussion paper." Canadian Journal of Communication. Vol. 13, No. 3/4: 63-85.
- Tuthill, Lee. (1997). "The GATS and new rules for regulators." Telecommunications Policy. Vol. 2, No 9/10. London: Pergamon: 783-798.
- US (United States of America). (2000). Digital Economy 2000. Washington DC: US Department of Commerce.
- US. Falling Through the Net: Defining the Digital Divide - A report on the telecommunications and information technology gap in America. Washington Department of Commerce.
- US. (1987). "Senate report: Range Goals in International Telecommunications & Information."
- Winseck, Dwayne. (1998). Reconvergence: A Political Economy of Telecommunications in Canada. Cresskill, NJ: Hampton.
- Winseck, Dwayne. (1997). "Contradictions in the democratization of international communication." Media, Culture & Society. Vol. 19, No. 2. London: Sage: 219-246.

Weiss, Marc A. (1985). "High-technology industries and the future of employment. Silicon Landscapes. (Eds.) Peter Hall & Ann Markusen. Boston: Allen & Unwin: 80-93.

Woodow, R. Brian, Kenneth Woodside, Henry Wiseman & John B. Black. (1980). Conflict Over Communication Policy: A study of federal-provincial relations and public policy. Montreal: C.D Howe Institute.