

FINDING OUR NICHE: The Knowledge Economy and Prince Edward Island

Papers from a Public Forum held Monday, February 23, 1998 at the K. C. Irving Lecture Theatre, University of Prince Edward Island, and the MacKinnon Lecture Theatre, Holland College

Hosted by the Institute of Island Studies, the University of Prince Edward Island, and Holland College

Project Partners: Human Resources Development Canada, The Knowledge Economy Partnership, The Province of Prince Edward Island, The Atlantic Canada Opportunities Agency, Island Tel.

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FOREWORD

This publication represents both genesis and product of an undertaking which we have come to call the Knowledge Assessment Methodology Project (or KAM).

Allow me to explain. . . .

To begin, the Institute of Island Studies makes a practice of sponsoring Public Fora on issues of major importance to Prince Edward Island - Maritime Union and the future of Island agriculture being recent examples. We then publish these proceedings in a format similar to that of the report you are now reading.

Early last year, we decided to hold a Public Forum on a topic about which we had been hearing a great deal but understood very imperfectly -- the so-called Knowledge Economy and its implications for the future of our province. We assumed that our own state of ignorance might be shared by many of our fellow citizens.

In planning this Forum, we set out to answer what we considered to be several key questions: What is meant by this term "Knowledge Economy"? How is it manifested "on the ground" in Prince Edward Island (for example, how many, and what sorts, of jobs at present)? What are the implications of this "paradigm shift" for employment in our rural communities? What sort of long-term strategy would make sense for Knowledge Economy development in Prince Edward Island?

To help us think through these matters, we called on a long-time friend of the Institute, Gary Stairs of Fredericton, New Brunswick, where he has been a pioneer in Knowledge Economy development. It was then through Gary that we learned about the Knowledge Assessment Methodology Project of the National Research Council (U.S.) in Washington. Almost before we

knew what was happening, we were negotiating with KAM Project Leader Dr. Michael Greene about the possibility of Prince Edward Island being one of the first World Test Sites for this intriguing new methodology; we were raising money for this initiative from various funding partners; and we were organizing the Public Forum as the launch event.

The Forum was held on Monday, February 23; we gave it the title "Finding. Our Niche: The Knowledge Economy and Prince Edward Island." The day-time sessions at UPEI were followed by an evening presentation at Holland College, where Michael Greene and several National Research Council colleagues discussed the ins and outs of the KAM and how it was to be tested in Prince Edward Island. Only the proceedings of the day-time sessions are included in this publication. To learn more about the KAM - including the availability of related publications -- we refer you to the Institute's website.

In all, there were eight speakers in the four day-time sessions, the titles of which give a good idea of the overall thrust of the discussion: (1) "What Is the Knowledge Economy: Should PEI Be Interested? Where Are We Today?"; (2) "The Business of the Knowledge Economy: The PEI Perspective"; (3) "What Does the Knowledge Economy Mean for Community Development?"; (4) "Who's Leading the Way? A Look at New Brunswick and Irish Models."

Because of the nature of the topic and the presentations, some of the eight presenters worked from slides rather than from traditional speakers' notes. For those presenters who provided slides, we have reproduced their content as accurately as possible while making their format consistent with the rest of the document.

The KAM-PEI will finish by the end of 1999, when the National Research Council (National Academy Press) will publish a report with recommendations for the Prince Edward Island Government and other Knowledge Economy stakeholders.

I shall end this brief foreword with a special thank you to our various KAM partners who are providing essential support, financial and otherwise: the Province of Prince Edward Island, the Atlantic Canada Opportunities Agency, the Knowledge Economy Partnership, Human Resources Development Canada, Island Tel, Holland College, and the University of Prince Edward Island. Nor can I overlook the invaluable contribution of KAM Project Coordinator Nancy Murphy, KAM Research Director Wendy MacDonald, proceedings designer and editor Jane Ledwell, and other colleagues at the Institute of Island Studies.

Harry Baglole, Director Institute of Island Studies

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THEME ONE:

[The Knowledge Economy: What Is It? Should PEI Be Interested?](#)

WAYNE HOOPER, CEO of AVC Inc.

WENDY MACDONALD, consultant and policy analyst

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THEME TWO:

"The Business of the Knowledge Economy: The PEI Perspective"

ED LAWLOR, owner of DeltaWare Systems and President of the Information Technology Association of PEI (ITAP)

DAVID COOK, Adjunct Professor of Political Studies, UPEI
[Prince Edward Island's Knowledge Based Exporters.](#)

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THEME THREE:

"What Does the Knowledge Economy Mean for Community Development?"

AUBREY CORMIER, founding Director of the Centre provincial de formation pour adultes, Wellington

ISLAND FRANCOPHONE TELECOMMUNITY PROJECT

Wellington, P.E.I.

June 1998

INTRODUCTION

New Information and Communications Technologies (NICT) are effective and efficient tools for community development. Among other things, they provide access to the information highway and to data, information and knowledge banks that would otherwise be difficult to access in rural communities. These tools create means to increase social and community interaction and to promote the transfer and sharing of knowledge, as well as social and economic development. They also allow for the optimal use of limited human resources such as in the case of distance training and education. The goal of the Island Francophone Telecommunity Project, sponsored by the Société éducative de l'Î.-P.-É., is to link all the Acadian and Francophone areas of Prince Edward Island, through the establishment of a NICT network, and to offer the Island's Acadians and Francophones an incomparable community development tool.

The Société éducative de l'Île-du-Prince-Édouard is currently the only provider and principal user of NICT within the Island's Acadian and Francophone community via its Centre provincial de formation pour adultes. The Société's mandate is to provide adult Francophones access to distance education training in French, adapted to their needs in postsecondary, professional,

community and personal training. Although its mandate is province-wide in scope, up to now, the Société éducative has concentrated most of its efforts in the delivery of postsecondary training in Prince County. The limited technological infrastructure prevents it from adequately serving the other Acadian and Francophone areas of the province and with the limited number of human resources at its disposal, it cannot, at the present time, focus on community training. The Island Francophone Telecommunity Project initiative will allow it to extend its field of activity throughout the province and to commit more resources to community development as a whole.

During the last three years, the Acadian and Francophone community of Prince Edward Island has defined its needs and wishes on several occasions. Among other things, an urgent need was expressed for high-quality continuing education in French, something on the leading edge of technology, as well as for the development of a current and up-to-date information tool to keep the community informed of all anticipated changes in government programs. The Island Francophone Telecommunity Project represents a tailor-made tool to respond to these needs. It also allows, through ongoing exchanges of information, for the better articulation of community priorities common to all Acadian and Francophone areas, which, in turn, promotes concerted development efforts for the entire community.

CONCEPT DEFINITION

It is time now to establish just what we mean by telecommunity. A telecommunity is a society or any community which, although composed of several groups separated by distance, is integrated by means of telecommunications systems. These systems bring together the different elements of this community and link them to the outside world. These interactive systems permit the rapid exchange of information with the help of a telecommunications network which includes, among other things, multimedia computers, classroom and desktop video-conferencing, audio-graphic systems, as well as the Internet.

The telecommunity concept is an innovative idea that has recently emanated from the United States. Essentially, this concept can be defined as a union between community development and NICT. In other words, it is a new approach to community development through which NICT becomes a privileged means of intervention, operation and networking (internal and external). There are multiple NICT applications and they can vary according to the particularities of the community or even according to the specific needs of the sectors included within it.

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PROJECT DESCRIPTION

The Island Francophone Telecommunity Project involves the installation of a technological infrastructure and the hiring of the necessary human resources for the creation of a Francophone virtual community in Prince Edward Island. There are four parts to the project:

1. Hire human resources, including contractors, to establish and set up the Island Francophone telecommunity.

2. Install the necessary technological infrastructure to link all the Acadian and Francophone areas into one telecommunity.
3. Train trainers in each Acadian and Francophone area to be skilled in ensuring the proper operation of each centre, as well as the network which will link them.
4. Establish virtual incubation centres which will allow the development of the NICT industry and, more specifically, the development of French multimedia products.

OBJECTIVE

The general objective of the Island Francophone Telecommunity Project is to foster the development and growth of Prince Edward Island's Acadian community by creating a knowledge-based society where the use and exploitation of NICT is common practice. Its goals are to provide Island Acadians with the most advanced information pertaining to NICT, to improve the quality and number of government services in French, to strengthen the ties among the various Acadian and Francophone communities throughout the Island, to increase the exchange of knowledge and information within the Island's Francophone community, and to give people access to the outside world without necessarily having to move.

STRATEGIC PRIORITIES

The main strategic priorities are to:

1. Hire human resources, including contractors, to establish and set up the Island Francophone telecommunity.
2. Provide the Acadian and Francophone community of Prince Edward Island with a telecommunications network connecting the Acadian and Francophone areas to form a virtual community or telecommunity.
3. Develop a knowledge-based culture within the Acadian and Francophone community by exploiting the telecommunity concept.
4. Provide the Acadian and Francophone community with an innovative mechanism for community development.
5. Provide access to distance education and training to all Prince Edward Island Acadians and Francophones.
6. Develop the new information and communications technologies industry by encouraging the development of French multimedia products, which would provide access to a previously inaccessible international market.
7. Improve the quality and quantity of French government programs and services available to the Prince Edward Island Acadian and Francophone population.

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RATIONALE

Having outlined the Island Francophone Telecommunity Project in broad terms, let's discuss aspects of it in a little more detail.

Global tendencies and NICT

During the last decade, the global economy has experienced radical transformations. Three events in particular have caused an upheaval in the economic stability that has reigned since World War II: market globalization, a decrease in the role of the State in the economy, and the technological revolution, in particular NICT.

Market globalization. The General Agreement on Tariffs and Trade (GATT) member countries have signed a new trade agreement (World Trade Organization) which will reduce and practically eliminate trade barriers and other obstacles to international trade within the GATT community. Moreover, Canada, the United States and Mexico have signed a commercial agreement with the intent of facilitating trade among the three countries.

Role of the State. The role of the State has also undergone substantial change. Up to the end of the last decade, governments played a dominant role in the economy, being involved in almost every aspect of economic activity. They were owners of businesses and economic infrastructure, producers of goods and services, regulators of markets and stimulators of economic activity. In part because of the increase in the deficit and the alarming growth of the debt, but also in an effort to promote competitiveness and economic growth, governments have gradually reduced their presence in the economic world, allowing market forces to ensure economic stability. The watchwords have become devolution, privatization and deregulation.

Technological progress. A third element which has contributed to upheavals in the world economy is the acceleration in technological changes, most particularly the progress made in the NICT field. These have paved the way for a knowledge-based economy and have radically transformed the way we live, learn, work and play. Ongoing training and lifelong education have become a part of life.

On the one hand, these three events have contributed to considerably increasing international competition. On the other hand, they have opened up numerous opportunities for innovative entrepreneurs who know how to adapt to and master the new technologies.

In this context, any society which masters NICT will experience important social and community development, as well as sizeable economic growth. However, any society which does not master NICT is in serious jeopardy of slower social, economic and community development and all the ensuing social problems. The Island Francophone Telecommunity Project provides a unique opportunity for the Acadian and Francophone community of Prince Edward Island to learn and master NICT for its professional, community and personal development, and to integrate itself fully in the knowledge-based economy.

Development of the NICT Industry

Except for the Charlottetown area, the economy in the Acadian and Francophone areas depends on the primary sector (fishing and agriculture) and on tourism industries which are subject to strong seasonal fluctuations. This results in sporadic employment and high unemployment rates. Moreover, there are few possibilities for expansion in the primary sector. On the other hand, the tourism industry is underdeveloped in Acadian and Francophone areas, except for Charlottetown and Rustico, and there are opportunities for growth. It must be noted that the number of Francophone tourists and visitors, especially from Quebec, is quite high.

In general, the economy is in dire need of diversification, especially into areas which offer year-round, full-time employment.

In this respect, the NICT industry offers sound opportunities. The NICT potential is enormous, particularly in the production of French multimedia products. According to a feasibility study conducted by the consulting firm Normand Corno (in partnership with Andersen Consulting), regarding the establishment of an International Centre for Excellence in multimedia production, the production of French multimedia products is a relatively unexploited area that lags considerably behind the production of English multimedia products. Therefore, the Telecommunity Project, which includes the establishment of virtual incubation centres for the production of French multimedia products, offers opportunities for economic diversification and the creation of full-time jobs in a strong growth market which has been practically untouched.

This initiative can also be used for the promotion of cultural tourism. For example, French cultural activities, including festivals, theatre, musical performances, craft shows and the Acadian Museum, could be promoted on the Internet. This advertising would project a dynamic Francophone community and would attract other Francophone visitors, particularly from Quebec, to Acadian and Francophone areas.

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Community Development

Judging from the expressed needs of the Acadian and Francophone community, NICT has important applications for community development as well. The main recurring themes articulated by the community have been: culture and heritage, education and training, economy and tourism, youth and sports, health and community services, women's issues, and technological needs. Among others, an urgent need was expressed for obtaining high-quality continuing education in French on the leading edge of technology; connecting the Rustico area to a computerized education network; developing an information tool which is current and up-to-date to keep the community informed of all foreseeable changes to government programs; obtaining training programs in communications and electronic arts; and developing a data bank to reply to the needs of the cultural and tourism industry stakeholders.

The Island Francophone Telecommunity Project is an excellent way to address these demands. The ongoing exchanges of information also permit a better articulation of community priorities

common to all Acadian and Francophone areas, and promote combined development efforts for the entire community. In addition, by strengthening the links among the various Acadian and Francophone areas, each will be able to benefit from the strengths of the others.

Government Services and Official Languages

In addition to its economic and community development applications, the project provides a vehicle for the delivery of government programs. The federal government, by virtue of the Official Languages Act, must serve all Francophone and Anglophone communities in their language of choice. In addition, Section V11 of the Act commits the federal government to support the development and vitality of minority Francophone and Anglophone communities.

The provincial government, by virtue of its French Services Policy, wants to ensure that Prince Edward Island benefits fully from its bilingual resources and explores new options for economic and tourism development.

Under the federal-provincial agreement, the Knowledge Economy Partnership, the two levels of government are committed to collaborating to facilitate access for Islanders and visitors to government programs and services in their language of choice.

Under this same agreement, the two governments, in partnership with the community, strive to find new, innovative, and effective means of delivering government programs and services.

The Island Francophone Telecommunity Project will offer the federal and provincial governments a network linking all the province's Acadian and Francophone areas. This will permit the effective and efficient delivery of programs and services to the Acadian and Francophone communities in their language of choice. By using this network, the two governments could maximize client benefits, increase the quality and quantity of services, realize cost savings in the delivery and administration of programs and services, and also avoid duplication between the two levels of government.

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Training and Education Needs

Education for Island Francophones poses some formidable challenges. There is no Francophone postsecondary education institution in Prince Edward Island. Certain areas do not have French schools, and the assimilation rate is alarming. The functional illiteracy rate there is also quite high.

In January 1994, the Société éducative de l'Île-du-Prince-Édouard signed a Memorandum of Understanding with the Government of Prince Edward Island in which the two parties agreed to collaborate in the creation of a French training centre in Wellington. This agreement led to the establishment of the Centre provincial de formation pour adultes. The agreement's objectives were to:

? Ensure that Island Francophones have access to French adult education and training programs offered by the Collège de l'Acadie or other appropriate sources;

? Administer an adult training centre in the Wellington area which would offer the following courses in French: professional development, personal interest, literacy and general training; and

? Promote community development by offering educational programs and other training programs in French.

Conclusion

The Société éducative's mandate is province-wide in scope and includes community development, in addition to adult training and education. However, up to now, the Société éducative has concentrated its activities in the Evangeline area in the fields of adult distance education and training. First, the lack of technological infrastructure prevents it from encompassing the other Acadian and Francophone areas of the province. Second, lack of human resources prevents it from adequately fulfilling its community development mandate. The Island Francophone Telecommunity Project will allow the Société to extend its area of activity and reach all Acadian and Francophone areas of the province, as well as commit more resources to community development. Through this ambitious project, exciting new technologies will become tools for reaching, binding, and strengthening a key "virtual" community within PEI.

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PAUL PATTERSON, Chair in the Management of Technological Change Office at the University College of Cape Breton

WHAT THE KNOWLEDGE ECONOMY MEANS FOR COMMUNITY DEVELOPMENT: THE DIFFERENCE BETWEEN SUCCESS AND FAILURE

Knowledge Economy

Today, although I will be speaking about what has been happening in Cape Breton, it will be as a special case that could also serve as a model for what can be done in other non-metropolitan regions.

There is a metaphorical image, for our approach to community development through knowledge-based, economic activities, which I think is helpful to those seeking a simplifying path through the maze of competing ideological theories. I normally use the example of the freeze-up of the Bras d'Or Lakes, but there is a local equivalent. From the window of the airplane, flying over the Northumberland Strait this sunny, winter morning, I could see large, circular pans of ice drifting together, touching in some places and still separated by narrow strips of water in other places. Within each of these large ice pans, which were several kilometers in diameter, one could discern the outlines of a large number of smaller pans, each a few hundred meters in diameter,

which had coalesced to form the larger pans. Similarly, within these smaller pans, the outlines were visible of a much larger number of very small ice pans, a few meters in diameter, which had fused to form the intermediate-sized pans.

This coming together of what had been many small, separate ice floes, to eventually form a solid surface that would enable anybody to travel freely across the water, in any direction, symbolizes how the contributions of many local leaders, disparate and unrelated at first, can eventually form a bridge, available to all, for the support of almost any purpose.

In his book, *The Demon-Haunted World*, written just before he died, the astronomer Carl Sagan pointed out that science "involves more than knowledge; it is a way of thinking." The same could be said of other fields, including artistic and entrepreneurial activities. However, Sagan was gravely concerned that:

We've arranged a global civilization in which most crucial elements— transportation, communications, and all other industries; agriculture, medicine, education, entertainment, protecting the environment; and even the key democratic institution of voting — profoundly depend on science and technology. We have also arranged things so that almost no one understands science and technology.

He saw this as a "prescription for disaster."

In Cape Breton, here in Prince Edward Island, in the rest of Canada and elsewhere, there is an unanswered question looming on the horizon: will the information marketplace become yet another "tragedy of the commons" or will it fulfill its promise to bring new opportunities for constructive engagement to all? Put in another way, will a small number of dominant corporations, with the expertise and financial resources to exploit advanced technology and influence government policy, succeed in defining the knowledge economy as a mass distribution system for their entertainment, information, and business services; or will individuals and small organizations in communities everywhere be able to participate, not merely as consumers, but as learners, citizens, and independent providers of products of the intellect and imagination?

For our purpose today, these questions boil down to one: how can the residents of non-metropolitan communities ensure that the knowledge economy serves their needs?

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The Theory

After several decades of learning from unsuccessful attempts at economic development on Cape Breton, we think we have finally identified a coherent approach that might just succeed - at least, for us.

The theory goes something like this:

- The problem for non-metropolitan communities is their lack of technical and financial resources to take advantage of modern technology.
- The presence of large industrial facilities, with their high start-up investment, is not necessary for the evolution of a knowledge economy.
- In Cape Breton, as elsewhere, the computer is rapidly displacing the automobile as the defining cultural artifact. Communications and information technology have now become a "people's technology." Some of you may recall the famous New Yorker magazine cartoon: two dogs are looking into a computer monitor, and one is saying to the other, "The wonderful thing about the Internet is that nobody knows you're a dog."
- Only individuals have new ideas — not machines, not software, not even large organizations. In an era when creativity and innovation, in work which requires imagination, will be more important than sheer efficiency of production, networked personal computers in the hands of 21st- Century designers promise to open up to cooperating groups of individuals some of the opportunities previously accessible only by large companies. These include:
 - Analysis and design activities of all kinds
 - The production of creative content: music, visual art, story-telling
- If they are to take root and thrive, organized efforts to promote a technology-based economy must be appropriate to any special aptitudes of the people to be engaged. Gardeners planning for successful harvests avoid exotic transplants and rely on crops already adapted to local conditions. Moreover, at the rate with which technology is currently changing, communities don't have time to develop totally new strengths to a competitive level.
- Technology is now so sophisticated and it is changing so rapidly that it requires the continuous coordination of experts with advanced knowledge and skills in different specialized fields to effectively compete in any technology-based business activity.
- Coordination requires communication, which makes interpersonal communication fundamentally important to the entire development process.

What is Required?

First, there are still lots of details to be worked out, but it is already clear that the home-grown approach beginning to take shape in Cape Breton is greatly facilitated by ready access to the resources of a university which is working closely — very closely — with a regional development agency and existing technology-based firms.

Second, we see the need to build three types of island-wide infrastructure:

1. A Physical Infrastructure

(a) A digital communications infrastructure capable of supporting the coordination of the collective effort of a variety of specialists — what we, in Cape Breton, call "The Big Pipe."

(b) A network of mutually supporting Community Access Project (CAP) sites, each serving three functions:

- "Community Computing Commons." A place where people who cannot yet afford a computer — and may never be able to afford a computer — can nevertheless learn how to use computer and Internet technology.
- "Community Extension Campus." A local centre for personally directed, life-long learning, where people can take on-site or on-line courses to advance their education and skills, of practical value and personal interest, suited to their present needs.
- "Community Enterprise Centre." A local incubation centre, linked to academic and business mentors, for defining, planning, starting and supporting new, technology-based enterprises.

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2. A Social Infrastructure

An island-wide, social network which encourages interpersonal and inter-organizational cooperation and sharing of resources in the development and application of advanced technology, one in which the resources of development agencies can be closely connected to the needs and capabilities of local communities.

Our template for such an infrastructure has become the Technology Advisory Group (TAG). The TAG is an informal, community organization, jointly sponsored under a memorandum of understanding between Enterprise Cape Breton Corporation and the University College. TAG meetings take place at the University College one evening a month, from September to June. The purpose of these meetings to provide guidance to the Island's technology, business and educational communities, to help them (a) identify the technical and business needs of the community; (b) introduce promising technology innovations and opportunities; and (c) develop and expand linkages between the private sector and the University College.

In an atmosphere of infectious enthusiasm, members give brief presentations and socialize, sharing information and new ideas, acting as technical advisors to each other and helping one another succeed in business. There are no charges or membership fees. Currently, TAG has about 600 members, of whom between 80 and 200 attend each meeting. Members do not have to be operating a technology-based business to benefit from the group; those who regularly attend include researchers, students, business people in non-technology businesses, educators, investors and people from private and public life who are just curious about technology or the TAG itself.

TAG benefits the community by increasing awareness of new technologies, alerting members to upcoming business opportunities, dramatically expanding personal networks, and organizing

follow-up tutorial seminars on specialized topics and discussions between members and the University College.

One premise behind this kind of in-person gathering is that education is not merely the transfer of information, it also involves the structuring of meaning and the sharing of inspiration. Those who are succeeding serve as models that others may emulate. Another premise is that the competitive advantages that stem from clusters, as in Michael Porter's Cluster Model, arise from existing strengths, the identification of which is facilitated and validated by the involvement of the community.

The TAG process has begun to extend into other fields and areas. The success of the original TAG has inspired the establishment of the Culture and Heritage Advisory Group (CHAG), the Strait-East Nova Technology Advisory Group (S-ENTAG) and the Information Technology Advisory Group (ITAG), which meets in the Museum of Industry, in Stellarton.

The TAG has also been responsible for the creation of MEDIAfusion, an association of multimedia producers; the Cape Breton Community Network; Silicon Island, a digital media production and centre and art gallery; and the Technology Enterprise Centre at the University College of Cape Breton, an innovation centre for applied research and commercialization of technological innovations. An effort is now underway to establish a high-speed, digital network, linking all CAP sites (the "Community Channel"), and to extend the TAG process to young people, in order to create opportunities for their participation in projects that will give them experience with technology and business, and to improve their chances of local, knowledge-based employment.

3. A Technological and Entrepreneurial Culture

A third prerequisite is a community environment that:

- reinforces a shared perception of what is not only a feasible, but also, an appropriate and desirable future to pursue;
- empowers its residents as citizens, not merely as consumers;
- promotes a culture in which technology serves our humanity, not the other way around ("What matters is not the telephone, it's the conversation.");
- fosters interaction among both geographical communities and sectoral communities, and between the older generation and the younger generation. (The young people will either leave for greener pastures or stay to help rebuild the farm.)

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How is it Supposed to Work?

Like an automobile transmission, the purpose of our home-grown approach is to engage and adapt the power of whatever is the "economic engine" to the speed of the wheels — "where the rubber meets the road" — gearing economic development efforts to people from different backgrounds and at different levels of expertise and ability.

For the sake of illustration, one can define three such levels, like a layered-cake or a three-level pyramid:

1. Enthusiastic, knowledgeable amateurs: a broad community base of people who use the technology for education and entertainment or to enhance traditional business operations. At its broadest extent, this group could include an entire, technology-literate community, in which everyone knows something about the new economy. These people support the development of infrastructure and new business initiatives; approve of, appreciate and patronize the work of those in the upper two, professional levels; and serve as the reservoir of entry-level talent from which those in the higher levels of ability are drawn.

Such a community environment is one in which:

- Knowledge-based work is not merely socially acceptable, but socially desirable.
- Those local people who are concerned about the public interest can:
 - grasp the issues
 - knowledgeably question those in authority, and
 - set their own community agendas.

2. Interns: those people from the wider community with sufficient interest and expertise in the applications of technology to earn money doing work for other people, in particular, those at the highest professional level. In earlier times, these would have been "apprentices" who were capable of working with "masters," implementing their ideas. Interns are those who are learning about technology, the global marketplace and the fundamentals of entrepreneurship and management. They serve as the reservoir of talented people who aspire to excellence and strive competitively for the highest level.

3. Elite specialists: the relatively few artistic, technical, entrepreneurial and academic "stars" who generate new ideas, and whose work meets the highest professional standards, provides professional credibility, attracts international recognition, and — hopefully — brings a steady backlog of work into the community.

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What Results?

Only a small percentage (4% - 5%) of the general population has the personality attributes of an entrepreneur, and even fewer end up becoming entrepreneurs (2% - 3%). Nevertheless, entrepreneurs can employ other people with complementary talents, and the question is how best to help both entrepreneurs and their potential, non-entrepreneurial partners get together and take advantage of information technology, to make up for the disappearing jobs in traditional industries.

Over the past three years, small firms in Cape Breton have begun pursuing off-island opportunities that are accessible from Cape Breton. These efforts have emphasized technology-based work that has a relatively low entry-cost and a high degree of reliance on the inventive imagination. Multimedia production, electronics, and other design work have proven to be particularly well-suited to the traditionally creative and close-knit society of Cape Breton.

A division of labour has naturally emerged among our successful multimedia production teams. It suggests that a complement of four different kinds of "imagination" — the "artistic," the "technical," the "scholarly" and the "entrepreneurial" — enables the team to play competitively in the major leagues.

These "imaginings," crudely characterized, are as follows:

- The artistic imagination refuses to be bound to the security of conventional thinking. It enables a person to intuitively anticipate meaningful, future possibilities and to see beyond present reality. An artist expresses the ineffable by engaging the soul of the viewer, listener or reader and conveying insights through symbols that transcend words. The artist is usually not much interested in technology itself.
- The technical imagination is motivated by the challenge of making things work and pushing the capabilities of the technology. Technical people are usually more concerned about function than form, about efficiency and reliability more than beauty and harmony.
- The entrepreneurial imagination is focussed on achievement. Entrepreneurs are confident of their ability to solve practical problems, win customers, make a living and lead other people to a goal. For entrepreneurs, money is less of an end in itself than a measure of how well they are doing. They're usually more concerned with offering a product that people will buy than how it works or what makes it appealing.
- The scholarly imagination can express itself in any discipline. Scholars are collectors of knowledge who love their subject for its own sake. They are motivated by a desire to learn and understand everything about their specialty and to share it with others. In the field of computer-based instruction, the term "subject matter expert" is used to designate these people.

Since artists, technicians and scholars are normally less interested than the entrepreneur in the process of making money, the entrepreneur can provide opportunities that help the others support their passions. In practice, all members of the team come to appreciate that each kind of imagination is creative in its own way. Some people may possess one kind of imagination to an extraordinary degree; many others possess a combination of two or more to a lesser degree. But

the team must, at a minimum, include people with this full complement of imaginations, working together, all speaking the same "language" and sharing the same goal and ideas.

In the field of multimedia production, the artistic, technical, and entrepreneurial imaginations have proven to be a naturally symbiotic triad, with the scholarly imagination providing depth and coherence to the particular subject matter of the product. It now appears that these four "imaginings" represent four combinations of aptitudes that, taken together, span the full range of aptitudes required for competitive "completeness" — at least in design fields.

Whatever the number of knowledge and skills sets involved, the pyramid can be conceived of as divided into a corresponding number of vertical, "specialty" partitions, as well as the three horizontal "ability" planes. The goal is to dissolve the barriers separating all of the resulting compartments and make them all transparently accessible to anyone in the community.

If one were to describe non-metropolitan economic development in terms of an Olympic metaphor, what we are trying to build is a farm-team system, for developing Olympic-class teams of technology entrepreneurs and their artistic, technical, and academic partners — a system of self-selection and self-development that nurtures diversity and ability, as well as depth on the bench.

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Summary

Imagine an industry — or even an entire economy — in which goods and services are produced and exported by information and communications technology, respectively. This class of work could include a wide variety of analytic and design activities for education and training, entertainment, business services, and research. To the extent that a highly information technology-literate society can be cultivated on the Island, it would not be necessary for everyone to be an entrepreneur, so long as each person's efforts could be effectively engaged and coordinated with the contributions of others who are involved in the team-development of products for entrepreneurs who are effectively connected to relevant markets.

Because only individuals have new ideas, the basis for competitive advantage becomes the innovative effectiveness of the team, working cooperatively together. What is especially appealing about such an economy is that those people who are creating products of the intellect and imagination, can never be displaced by even the most sophisticated automation and expert systems software.

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THEME FOUR:

"Who's Leading the Way: A Look at New Brunswick and Irish Models"

GARY STAIRS, communications specialist and founder of the New Brunswick Knowledge Industry Newsletter

REMARKS TO THE SYMPOSIUM ON KNOWLEDGE ASSESSMENT

Introduction:

This afternoon, I have the pleasure of talking about New Brunswick's recent experience in the field of knowledge-based economic development. I especially want to focus on the key players and factors that are helping to bring about what I like to call the "knowledge-value revolution" in our province. However, as tempting as it is for me to talk about all of the New Brunswick firsts on the Information Highway, I'll leave that for you to discover for yourselves. To do that I encourage you to visit our website at www.gov.nb.ca/edt/infohigh/nbno1.htm.

My specific topic today will include the interplay of local and provincial leadership and the importance of strategic organizational alignments at all levels. I will also talk about the role of New Brunswick's relatively small urban centres, such as Fredericton, in this social and economic transition to the "knowledge economy." It is on this particular stage that I've been both audience and actor in the knowledge economy, although both roles have been played more unwittingly than it's safe to admit to you today.

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First, the personal perspective:

My own introduction to high technology came through working at NB Power and spending some years at the Point Lepreau construction site in the mid-70s. From the concrete dome of Lepreau, I went off to the concrete slabs of Simon Fraser University to study the political economy of communication, and returned to NB Power in Fredericton during the early '80s. There I conducted social impact assessments, played with Telidon technology, and planned for nuclear accidents that would never happen, surely.

At that time, I was also reading books that gave me a relatively early insight into the world of digital technology, a new world which few of us expected to see so soon. The titles of these books bear repeating to you, even today: Gutenberg 2: The New Electronics and Social Change and The Media Lab: Inventing the Future at MIT. Later, I read my all-time technology favourite by economist Taichi Sakaiya, The Knowledge-Value Revolution: A History of the Future.

Again quite unwittingly, I became a share-holder in a Fredericton-based literary and trade publishing house, Goose Lane Editions, in the late '80s. This gave me welcome chances to go to publishing and new media conferences in both North America and the United Kingdom. That was how I came to hear the word "convergence" from Nick Negroponte and Dave Godfrey and learned about smaller, cheaper, faster personal computing. On one conference junket, I recall being warned personally by futurist Frank Ogden that books were a rapidly dying medium. Shortly thereafter, I developed my own still-evolving vision of a multimedia publishing company. The digital Goose, perhaps?

The New Brunswick Knowledge Industry News (NBKIN):

Around this time, I began to think of myself as a "knowledge worker." I remember that this label had an elegant, langourous feeling to me which was not to last long as, in the fall of 1991, Software NB (SNB) came looking to me to create a newsletter! Concerned about the future competitiveness of their member firms in Atlantic Canada and in markets further afield, they wanted to produce a high quality, yet affordable, publication to help build their membership significantly from a mere twenty-one firms and individuals.

Upon further analysis, I discovered eight other organizations in New Brunswick that would ultimately be affected by the convergence of publishing, computing, and film. Moreover, they were all concerned with similar or related issues — small business finance, quality assurance, access to an appropriately-trained labour force and markets. These eight groups were persuaded, eventually, to join our ad hoc editorial board.

In the spring of 1992, things seemed to come together and we launched The New Brunswick Knowledge Industry News (NBKIN). The acronyms on the newsletter masthead read CIPS, DPMA, SNB, ITAC-NB, NBFilm, APA, GNB, CACP, and so on. Our mission was, and still is, to promote dialogue among knowledge workers, to be a focal point for ideas and news, to be an advocate for the emergent and wide-ranging knowledge sector, and to build a positive image for its "subset," the IT industry. Our first print run of 1000 copies moved out the door very, very quickly, much to even our own surprise!

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The Rise, and Fallings, of the Fredericton Knowledge Industries:

Not long after the newsletter launch, the Fredericton scene started to cook like popcorn. First, a Fredericton Knowledge Industries (KI) directory was created in the summer of 1992, followed by the formation of a greater Fredericton KI "Breakfast Club." Following that, we made several semi-successful bids to get an Atlantic Canada Multi-media Association underway.

We "revolutionaries" learned some significant lessons in those tough "start-up" years. (I say revolutionaries, in part because we began with a broad, inclusive notion of the KIs, even though the government policy-makers wanted us to focus on the information technology tools and didn't take initial ownership of the knowledge industry concept that we espoused). Our lessons were a) that there was a will within the then vaguely defined sector to work together; and b) that the KI revolution which we foresaw was ultimately about ideas, creativity and collaboration and not technology!

Through the 1992-94 timeframe, a number of local, regional, and national events added further fuel to the NB KI movement. These events helped to stimulate ideas, build awareness of public policy initiatives and activate flows of government funding and entrepreneurial ventures. I can tell you that I often felt like I was lobbing Molotov cocktails through the doors of the fortress! In one public speech during the early '90s, I urged the city of Fredericton to "wake up" and see its real capital as the knowledge of its citizens. I later told the city fathers that they should be preparing for voyages into the furthest regions of cyberspace, as they were now only "three

minutes from Tokyo," and talked about KBIs as the engines that would be pulling the train of prosperity in the future.

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In October 1992, inspired by a Coopers-Lybrand long-range economic planning process for Fredericton, I proposed a simple, three-part information age development strategy. The city should: 1) capitalize on the presence of government and universities (in both the provision of information resources and in the development of private sector "sensitive" public purchasing policies; 2) revolutionize the provision of public services by the city and the various economic development agencies, (in terms of how they might contribute more to local economic competitiveness); and 3) push for the establishment of local information infrastructure such as fibre, broad-band communications, tele-parks or media parks such as the one in Cologne. It particularly struck me that we should be creating economic development strategies to attract "information-rich" businesses to Fredericton.

Fortunately, these ideas found welcome venues in newspaper articles, the local Chamber of Commerce news, and in a number of regional trade publications, adding to the buzz of discussion within and without the fortress walls. I should note that this kind of local discourse in Fredericton was partially the cause, and partially symptomatic, of transformations that were taking place in our thinking and ways of doing business in NB.

After auspicious beginnings, 1993 was a year of mixed results for the KI in the capital. On the positive side, the city won the ITAC-sponsored Softworld '94 conference, the province got significant funding (\$10.5 million) to establish what we now know as the Tele-Education network, and our little band of Fredericton revolutionaries held a very productive strategic planning session for the KIs, in October of '93.

At this first, and only, strategic planning session for the NB Knowledge Industries Association, our workshop groups identified four areas of critical importance to the economic transformation of New Brunswick. They were: 1) the necessary government policy environment; 2) a positive public attitude, especially to support the preparation of a future workforce; 3) the widespread promotion of IT applications and the development of Atlantic regional approaches to the knowledge industries; and 4) the creation of knowledge-based infrastructure.

Although this workshop had succeeded in identifying many of the strengths and synergies needed for knowledge-based firms to work together, (as well as the seeds of a common understanding and vision), we ultimately failed, once more, to build the organizational framework that would lead to action — at least in the short term!

During Small Business Week '93 we also held a showcase of local multimedia and IT companies, which helped lead to the annual Infotech conference series, and, in the subsequent year, UNB-Fredericton hosted a conference of world-renowned business "clustering" experts, including the head of the Danish Technological Institute.

On the discouraging side, Software NB collapsed in a financial and staffing mess, NBKIN came to a grinding halt (then, restarted) and our efforts to get a KI association underway faltered. Finally, with the help of federal and provincial dollars, a provincial IT association and a training industry group were founded not long after Softworld '94.

A Developmental Quandry?

Back at City Hall in 1994, the city fathers and the various economic development agencies were beginning to get the picture about the long-term future and Fredericton's prospects for survival. They realized that, despite some initial naive optimism, the universities could not push the envelope of technological applications and KI economic development very well. Academics would, however, respond nicely to the pull for their expertise and know-how.

And the provincial government, while supportive in many, many ways could not lead the charge, locally. Nor were Fredericton's fledgling software firms in any strong position then to lead the charge. (Of eighty-four software firms listed in the SNB 1993-94 directory, forty-five were in Fredericton). The role of leadership, then, fell to the economic development agencies in the capital and other urban centres, and to the Province in creating a climate for growth.

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Premier McKenna and 'Driving' The Information Highway

Meanwhile, the government of Premier Frank McKenna was very busy "reinventing itself" from 1990-1994 and seeking to transform the economic environment in New Brunswick. These were the days of our early private-public partnerships, of ideas, investments, and building an infrastructure for change.

By 1993, NBTel had built the first fully digital telephone network in North America at a cost of \$236 million over the twelve years of construction. Furthermore, they had gone to full fibre optic switching and enhanced phone features, as part of their Business Communications Service Philosophy, which in turn led to the creation of a new field in New Brunswick known as "computer-telephony integration."

In parallel with these private sector initiatives, the province formed the NB Task on the Electronic Information Highway in September 1993 with the goals of positioning New Brunswick as a test-bed province and the government becoming a model user of the highway. Even while the task force was doing its work, both public and private sector were "rolling out" an ambitious range of information highway projects — and aggressively publicizing them. As a member of the extended information highway "crew," I found myself working on three of more than sixty projects — NB Alert, Tele-Education NB and the enhanced NB 911 project. I can tell you, these were busy, fun times in our public service!

By 1994, more than twenty major companies had established call centres in NB, for example: Royal Bank, Purolator, Camco, Canada Trust and so on . Many of them had located in Moncton

because of its bilingual workforce. More than 2,000 new jobs were created from 1991-94, generating \$50 million in new annual revenues.

If there was one single element responsible for the tremendous rate and scope of these transformations, it was the strong personal leadership of Premier McKenna. During 1993, alone, he made three keynote speeches — the State of the Province in January, the Throne Speech in March and the Information Highway Task Force speech in September — that laid the groundwork for the landmark State of the Province address in 1994.

In his 1994 State of the Province speech, using a province-wide satellite broadcast, the Premier unveiled his new policies and programs on technology. He declared that New Brunswick would produce tomorrow's technologies today, that we would break the cycle of dependency on Ottawa, and that we would focus on literacy and technology in education. New Brunswick would lead the development of the Information Highway, in part by having the first Minister responsible for the Information Highway in Canada.

In a powerful appeal to the local audience, the Premier declared that Fredericton would play a key role in "driving" this highway. He also expressed his support for Fredericton's first economic development officer and pledged his backing for both Softworld '94 and the knowledge industries association. (As you Islanders may know, Fredericton, our capital, is a city where people historically sat and pondered under the stately elms, while Saint John actually built things and Moncton sold them. Now New Brunswick has the new city of Miramichi, where many small, young firms are conceiving, building and selling IT products and services.)

As journalist Don Richardson recently noted "Frank McKenna excelled in creating hope. By hustling for new jobs and attracting new industries from outside the province, he was able to create the impression that changes were coming and that things were getting better. He skillfully developed a sensation of momentum — that NB is a province on the move with an economy ready for the future and the jobs to go with it — and cultivated in New Brunswickers the sensation that things were getting better." According to Richardson, this created short-term optimism for all and, in the long-term, helped younger New Brunswickers open their eyes to new fields of endeavour.

Within six months of the Premier's initial speech, the NB Information Highway Task Force Report was published on 1 March 1994. Among other findings, it advocated building an entrepreneurial environment for the "rapid and rational development" of the Highway. For government, the report recommended an important leadership role through persuasion, creating a positive regulatory environment, helping to develop and maintain standards, using and testing the highway, directly supporting the development of goods, services and expertise, and breaking down internal and external trade barriers.

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A Legacy of Hope, Optimism, and Increased Prosperity

Looking back over the past five years, the province estimates it has helped to develop more than 200 companies (63% of which employ 1-7 persons) and 2,700 new jobs in IT. These firms contribute \$80-\$95 million in estimated annual new payroll.

Today, the city of Fredericton, which merged three separate economic development organizations in 1995 into the Greater Fredericton Economic Development Corporation (GFEDC), figures that there are 3,000 people employed in its knowledge industries and that its "hi-tech" sector has doubled in the past three years. This organization now has an annual budget of more than \$1 million/year with nine employees and is co-located with the province and the federal government agencies that provide regional development in its area. Construction of a Greater Fredericton Knowledge Park is well underway and the organization has recently decided to "adopt" the long-orphaned NBKIN. As Jacques Dube, the GFEDC CEO noted to me recently, "the fix is now in for Fredericton," and GFEDC is very excited about future prospects.

At the provincial level, the Information Highway Secretariat, founded with an initial two-year mandate, was revived in 1997 with a new vision, mandate, and advisory council. Its new vision is to create in New Brunswick, the first "truly IT-friendly society in the world." As well, the government has recently established the NB Innovation Network to assist broad-band developers through a development fund (see www.gov.nb.ca/nbinet/eindex.htm).

Looking forward, the province of New Brunswick has set the objective of 3,500-5000 new IT jobs over the next five years. Because they anticipate there will be a significant crisis due to a shortage of qualified IT workers, both the province and GFEDC have concentrated heavily over the past 1.5 years on building "job-ready workforces" in information technology to meet the present and projected demand. Some of the notable outcomes of their efforts include industry surveys on provincial and local employment in IT and KI and the Premier's Forum on the Job-Ready Workforce in the spring of 1997. The province continues to operate an interdepartmental job-ready IT task force, and the KI champion task force of the GFEDC has commissioned a considerable amount of IT labour force research using federal and provincial funding.

To summarize the province's present IT strategy, the New Brunswick government intends to: 1) create an IT literate society; 2) focus on human resources development (through doubling college and university graduates, giving non-IT graduates IT exposure and providing custom training for companies); 3) continue to develop the infrastructure; and 4) promote investment and trade in targeted sectors. These sectors include advanced training technology and multimedia, virtual software application development centres, tele-health, geomatics, and tele-education.

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Conclusion:

In closing, there are a number of observations and "lessons learned" that I would like to share with you in this forum today. They are:

- Even though government studies and funding are not 100% strategic (nor do their programs have all of the intended outcomes), a positive public sector climate is still very helpful in

stimulating discussion of "best practices" and the flow of ideas, as well as a means of maintaining momentum.

- New Brunswick's well publicized successes were, ultimately, due to all partners creating an environment of officially sanctioned risk-taking, where it was also OK to make mistakes and have some "failures."
- The universities were slow and risk-averse, by nature. (They won't lead, but will support, the charge.)
- The ongoing support of the most senior political leaders and grass-roots civic organizations are equally important and essential to this type of endeavour.
- Having said that, private sector leadership and healthy industry associations are especially vital.
- In the knowledge economy, "soft" or intangible factors such as experimentation, play, socializing, mentoring, and finding role models play crucial influences in creating the learning culture necessary for this kind of economic transition.
- As in all revolutions, specific individuals can and do ultimately make the difference and so, really, diversity is good. This I can assure you: that wacky inventors, wild-eyed technology zealots, starry-eyed dreamers and even a few fly-by-night opportunists will play a part in PEI's future, as they have in the past! (Just remember what their contemporaries said about Buckie Fuller and daVinci in their lifetimes.)
- Finally, in New Brunswick, our provincial motto is *Spem reduxit, hope restored.* I urge you to echo this motto here. Based on our own harrowing experiences of road-kills on the Information Highway, I can assure you that there will be a periodic need to have your own hopes and spirits rekindled.

You are the vanguard of social and economic change on this gorgeous Prince Edward Island. I enjoy working with you on this rewarding project and thank you for the opportunity.

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DOUG HOUSE, former Chair of the Economic Recovery Commission for the Government of Newfoundland and Labrador

THE IRISH TIGER: Lessons for Atlantic Canada

Introduction

While it would be foolhardy to think that Atlantic Canada can simply mimic the approach taken by some other region to achieve success as a knowledge-based economy, it would be even more foolhardy to ignore the valuable lessons that can be learned from other places. The amazing success of the Republic of Ireland over the past decade, earning it the nickname "The Irish Tiger"

or "The Celtic Tiger," can be a source of both information and inspiration for Prince Edward Island and the other Atlantic Provinces.

I would like to take this opportunity to congratulate Harry Baglole and the Institute of Island Studies for taking the initiative to organize this event. The Institute is a unique and valuable island resource, and I only wish we in Newfoundland and Labrador had such an institute with its close ties to the community, close ties to government, and independent perspective on important policy issues.

The shift to a knowledge economy requires, first and foremost, a *shift in thinking* from an old economy based on agriculture and "natural" competitive advantages in resource industries to a new economy based on "constructed" competitive advantages in knowledge-based industries. In principle, such new economy competitive advantages can be created anywhere, and the old distinction between centre and periphery becomes less and less relevant. Hence, in an article extolling the virtues of the "Irish miracle," *The Economist* magazine concludes as follows:

Two things Ireland does show beyond a doubt. First, small countries on the fringe of rich trading areas can prosper mightily. The curse of the periphery is a myth. Second, "globalization," taken at the flood, is the fastest course to wealth. What is most striking about Ireland's new economy is how tightly it is linked to Europe and the world. If any country lends substance to the cliché that the global economy is an opportunity not a threat, it is Ireland.¹

If the Irish example is inspirational for showing that a successful transition to the knowledge economy is indeed possible for a region such as ours, it is also cautionary in that it shows that the transition is not easy. It requires social partnership, long-term planning, sound policy formation, and consistent efforts to *implement* the policy in an integrated way.

This paper should be viewed as simply an introduction to the Irish case, with a focus on lessons for Atlantic Canada. I will first sketch out what the Irish miracle refers to, then discuss some general lessons for Atlantic Canada, and then describe some features of the Irish information technology sector.

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What Have the Irish Accomplished?

The centuries-long legacy of economic difficulties, out-migration and high unemployment persisted in the Republic of Ireland throughout the decade from 1977 to 1987. During the subsequent decade, however, there has been a complete turnaround. The main features of this have been summarized in a recent book as follows:

- Over 50,000 net new jobs a year have been created in the mid-1990s.
- 216,000 additional jobs have been created — a 20 per cent increase since 1987.

- Growth rates are the highest in the world, running at 7.5 per cent a year in the late 1990s.
- Inflation is low.
- Nominal interest rates are low.
- There is a large balance of payments surplus.
- There is net immigration.
- There is a current account surplus.
- The National Debt has been dramatically reduced to 69 per cent of GNP in 1997.
- Industrial disputes are few and conflict has been replaced by partnership in the some enterprises.
- Profits are booming.
- Incomes are growing in real terms every year.
- The fall in the dependency ratio means most people are far better off.
- Irish living standards will soon equal the average in the EU.
- And the future looks good too!²

In addition to these impressive statistical changes, there has been an even more important qualitative change that would inspire Atlantic Canadians.

Alongside the very strong measurable improvements in every Irish economic indicator, there also appears to be another major change in Ireland — the qualitative and positive changes in attitudes in very many spheres. There is a new confidence and an emphasis on quality and performance in many areas, which will contribute to self-sustaining growth in the future. A "can do" philosophy is becoming widespread.³

During the course of the past half century, the composition of the Irish labour force has been transformed. While employment in resource industries *declined* from 400,000 in 1960 to 150,000 by 1994, non-resource based jobs *increased* from 660,000 to 1.1 million.

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How Has the Transformation Been Accomplished?

I will identify *eight principles* as of fundamental importance to the economic transformation of Ireland and provide brief descriptions of each. Note that this is a more *sociological* explanation than has commonly been provided for the Irish phenomenon. From my reading of the situation,

the key has been a well-*integrated* approach to social and economic reforms which are mutually complementary and supportive.

(1) *Social Partnership*. The major breakthrough came in 1987 when government, business, labour, and community organizations explicitly agreed to form a social partnership through which they would jointly and cooperatively work together to solve Ireland's economic problems. This social partnership included, as its centrepiece, a three-year agreement on wage increases in both the private and public sectors.

(2) *Strategic Planning*. In 1987, the government and social partners issued the first of a series of strategic social and economic plans. It outlined the approach to be taken for the ensuing three years, with clear targets to be achieved for such things as employment creation and debt reduction.⁴ New plans have been released every three years. The latest, published at the end of 1996, places heavy emphasis on the *social inclusion* of people who have not so far benefited from the dramatic turnaround.⁵

3. *Competitiveness and an Open Economy*. As the quotation from *The Economist* indicates, the Irish Republic has openly and whole-heartedly embraced its participation in the European Union, and has emphasized the central importance of competitiveness within the global economy. This marks a radical change from Ireland's earlier approach, which was quite protective and insular into the 1960s. The emphasis on competitiveness applies to all sectors, including agriculture, although care is being taken to continue some protection to agriculture so that the transition is not too severe for rural areas.

4. *Government Entrepreneurship*. The Irish have *not* resorted to a Thatcherite right-wing approach to their economic transformation. On the contrary, myriad government-owned companies and agencies have played a lead entrepreneurial role. Shannon Development, for example, took the lead in establishing the Shannon Free Zone, which now employs over 6,000 people in 120 firms, and, in partnership with the University of Limerick, set up the National Technology Park which employs 2,400 people in 80 firms. Unlike the situation in Atlantic Canada, such government agencies enjoy great autonomy, flexibility and access to the resources needed to get the job done. In a statement that rings strange to those used to the private enterprise rhetoric of North America, one official explained to me: "The public sector takes all the risks; that's what they're there for."

(5) *Inward Investment*. For many years the Irish Development Authority, now called IDA Ireland, has played an aggressive role in attracting outside investment into the Republic. There are now 1,200 overseas companies operating with 115,000 employees. Foreign subsidiaries of multinational corporations account for 46 per cent of the manufacturing workforce and 76 per cent of manufacturing exports. IDA Ireland is a very receptive, responsive, and adaptable agency, which delivers rapid turnarounds to clients' requests. It offers a package of tax and other financial incentives and, particularly as it has come to focus more on knowledge-based industries, extols the virtues of Ireland's education and training system.

(6) *Education and Training*. The Irish Republic places a premium on literacy, education, and training. It provides tuition-free post-secondary education to all students, and its training

institutes adapt rapidly to new economic opportunities. For example, as Ireland has become an important call centre for the EU countries, the system has geared up to provide language training in all requisite European languages. The Irish carefully monitor innovations in education and training in other countries, and take pride in emulating or surpassing the "best practices" of their competitors.

(7) *Social Inclusion*. In the words of former Taoiseach (Prime Minister) Garret Fitzgerald, "In almost every respect, the thrust of Irish policy has been exactly the opposite of that of Tory-governed Britain."⁶ The Irish have been very modest about their achievements, partly because they feel that too many citizens have been left out. Unemployment is still too high; there are too many families living in poverty; rural pockets have been left out of the new prosperity; crime and drug abuse are too common in the inner cities and public housing estates. The latest strategic plan targets improvements in these areas. The Irish belief is that the greater the social inclusion, the greater the contribution to and benefit from the new prosperity for all.

8. *The Implementation of an Integrated Approach*. While other regions, including Newfoundland and Labrador, have advocated an integrated approach to economic development, they have not been nearly so successful as Ireland in having such an approach implemented.⁷ Despite several political changes at the top during the past decade, successive Irish governments have been *consistent* and *persistent* in sticking to and implementing the successive strategic plans in an integrated way.

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The Information Technology Sector

The information technology sector has become an integral and growing part of the new knowledge economy in the Republic of Ireland. Inward investment has created over 2,000 jobs in teleservices alone. With companies such as IBM, Intel, Gateway, Dell, Fujitsu and Motorola, it is not surprising that nearly a third of personal computers sold in Europe are now made in Ireland. The Irish are now heavily into telemarketing, international finance and data processing for such banks and brokerage houses as Citibank, Merrill Lynch, Daiwa, ABN Amro and some 400 others. Through working in this dynamic environment, many Irish men and women have developed their own confidence and expertise in high-tech industries. It is particularly encouraging for the future that local companies with Celtic-sounding names such as Iona Software are springing up as an integral part of the new Ireland.

The Irish are living proof that it *is* possible to leapfrog directly from an agrarian to a knowledge economy, skipping the stage of heavy industrialization. Again, their example should be inspirational for Atlantic Canada.

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How About Atlantic Canada?

There is no easy way to achieve what the Irish have achieved in just ten years. It took vision, partnership, and a willingness to be consistent with the long-term in view. But it is encouraging to note that there was nothing magical about the Irish turnaround. It was not really a miracle; it was a people-made transformation. It is further encouraging to note that in Atlantic Canada today *we already have in place most of the ingredients needed to succeed as a knowledge economy*. In a recent visit to St. John's, the head of IDA Ireland, Kieran McGowan, addressed the local Board of Trade. His main message was that Newfoundland and Labrador is already well-positioned for an Irish-type take-off. In some ways, including telecommunications infrastructure, it is more advanced than Ireland itself. In Mr. McGowan's words: "You just have to do it." No doubt, these words apply equally well to the Maritime Provinces.

Although it is not as simple as McGowan suggests,⁸ it is encouraging that someone with his successful background should be so positive. Forums such as this one are a good place to start.

Conclusion

We *can* indeed develop a thriving knowledge economy in Atlantic Canada. This has to be done, however, in the context of creating the right institutional context and favourable business climate for that to happen. There is much to be learned from the Irish Tiger about how this might be done. It seems clear, for example, that we need to strengthen the social partnership in our region, and that, in a region where government plays so dominant a role in the economy, public sector entrepreneurship through semi-autonomous agencies would be a fruitful approach. In the words of the usually restrained, conservative *Economist*: "Miracles do happen, you know: look at the Irish economy."⁹

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Notes

1. *The Economist*, May 17, 1997, p. 15.
2. Paul Sweeney, *The Celtic Tiger: Ireland's Economic Miracle Explained*, Dublin: Oak Tree Press, 1998, pp. 4-5.
3. Sweeney, *The Celtic Tiger*, p. 10.
4. *Programme for National Recovery*, Deblin, 1987.
5. *Partnership 2000 for Inclusion, Employment and Competitiveness*, Dublin, 1996.
6. *The Economist*, May 17, 1997, p. 24.
7. See J. D. House, *Power Play: Politics, Bureaucracy and Economic Development*. Toronto: University of Toronto Press for an explanation of implementation failure in Newfoundland and Labrador due to bureaucratic obstruction, social fragmentation, and a lack of political will.

8. See House, *Power Play*, for a discussion of some of the reasons why it is not so simple.

9. *The Economist*, May 17, p. 16.

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