



The Information Revolution:

What impact could it have on regional development in Canada?

by Susan L. Antilla

Summary

What impact will the new technological developments of this post-industrial era specifically, information technology have on employment and regional development in Canada? What must we do to ensure the impact is a positive one?

We are now in the 'information revolution'. Information technologies are changing the structure of the global economy, the structure of our industries and the structure of our labour force. The main question for regional analysts, present and future, is whether or not economic activity in the lagging regions of Canada will be able to keep pace with these transformations?

If they can, the potential for regional economic development is tremendous.

The reality is that this high-tech industry runs on its people. It is now the internal strengths of the community that must be supported as the source of community economic development throughout the next decade. Much of the responsibility for preparing communities for what lies ahead falls on the local economic development officer (EDO).

Communities must look inward and build up their competitive advantages - namely, the human resource and information infrastructures necessary to support private initiatives. The EDO will have to shift the focus from creating jobs to creating employees. The other key component is the development of a sophisticated user-friendly information network in order to enhance the internal infrastructure.

Introduction

What impact will the new technological developments of this post-industrial era - specifically, *information technology* - have on employment and regional development in Canada? What must we do to ensure the impact is a positive one? If a direct link between these new informa-



tion technologies, employment and regional development. In applying this information, each community's uniqueness must be taken into consideration.

What is the Information Revolution?

The term 'information revolution' is used to describe the rapid transformations that are taking place in all economic and social activities as a result of the deployment of information technologies. In general, these information technologies include all of the innovative computer and telecommunications technologies created

Susan L. Antilla

Honours Bachelor of Commerce Degree
Lakehead University, Thunder Bay, May 1987

While all her classmates were heading to Toronto, Susan chose 'small-town' Northwestern Ontario and loved it. She became the Executive Assistant Rainy River Business Development Corporation in Fort Frances, Ontario. Later worked as Senior Advisor, Community Futures Office in Thunder Bay. Susan discovered too many questions about how government policy was working at the provincial and federal levels so she pursued a Masters of Applied Environmental Studies (University of Waterloo)

As a member of the Industrial Developers Association of Canada (IDAC) since 1990 Susan completed the Certificate in Economic Development (University of Waterloo, 1991) Currently employed as Sessional Lecturer, Department of Geography, Distance Education in the: Certificate Program in Environmental Assessment Lakehead University, Thunder Bay.

tion technologies, employment and regional development could be established, it would provide essential information to decision-makers (both in the public and private sectors) that would assist with more effective policy formulation and planning for future employment and economic development in regions outside of Canada's major urban cores.

This paper presents a generalist's view of the link between information technol-

within the last two decades.

The integration of these two groups of technologies, for the purpose of accessing information on a large scale, improving management productivity and gaining market advantages, is referred to as *telematics*.

The importance of information technology and telematic networks on the global economy, although sometimes exaggerated, is never-the-less tremendous.

In fact, the advent of information technology represents the single most revolutionary economic development of the twentieth century... Moreover, these technology-based changes will accelerate during the next 50 years or so, to the point where developed countries which fail to build a competitive capability in information technology will suffer an irreversible decline in economic activity to a degree which will seriously erode many of their long-established political and social foundations. (MacIntosh, 1986, p. XV.)

How significant will information technologies be in the Canadian economy? Small Business magazine, in its June, 1990 special edition entitled "Venturing into the 1990s", asked a panel of Canadian experts to predict, specifically, which technologies hold the most promise for development in the next decade. They unanimously predict that information technologies will lead the way. It is important to realize, however, "...the popular image of the high-tech sector may be inaccurate. The reality is that this industry runs on its people. Human skills - creativity and knowledge - are behind all the frontier hardware and software, so high-tech firms face a powerful human resource imperative." (Economic Council of Canada, 1990, no. 2, p. 13.) This leads us to the impacts that information technology has had on employment.

Information Technology and Employment

In general terms, information technology has impacted on the structure of the organization, the structure of the labour force and on the specific job descriptions of employees.

*"Because technological change plays a limited role in determining total employment, its impacts in this area are primarily sectoral in nature, and those impacts are affected only indirectly by aggregate economic conditions." (Cyert and Mowery (eds.), 1987, p. 3.)

*Information technology is resulting in the broad-scale upskilling of jobs. (Ginzberg, Noyelle and Stanback, 1986, pp. 92-93.)

*"Historically, technological change and productivity growth have been associated with expanding, rather than contracting, total employment and rising earnings. The future will see little change in this pattern." (Cyert and Mowery (eds.), 1987, p. 168.)

*Hiring criteria is becoming much more specific and employers are requiring employees with higher education levels. (Penzias, 1989, p. 191.)

*Employment opportunities for those with solid basic skills (ie. high school maths and english), will not be hampered. Entrant level employment will still be in strong supply. Note: "A substantial portion of displaced workers - 20 to 30 percent - lack these basic skills." (Cyert and Mowery (eds.), 1987, pp. 6, 170.)

*Within today's competitive international economic environment, the slow adoption of new information technologies and/or other productivity-increasing technologies is likely to cause more job displacement than the rapid adoption of such technologies. (Cyert and Mowery (eds.), 1987, p. 169.)

*New technology's displacement effect is only just beginning. (Ginzberg, Noyelle and Stanback, 1986, p. 90.)

*The educational system and on-the-job training are not preparing our workforce for what lies ahead. (Ibid, 1986, p. 97.)

*Substantial reductions in the cost of transmitting information is changing the location of the workforce. (Ibid, 1986, p. 96.)

*Those tied to the city may see their jobs disappear to outer regions. (Ibid, 1986, pp. 46, 55.)

This final point is based on the fact that, new technology makes it feasible, and increasingly cost effective, to work outside of major metropolitan areas.

On the positive side we, in Canada, have seen an increase in the number of information-related occupations in both the non-information sectors (primary and secondary) and in the entire service sector. On the negative side, information technology has caused a decrease in the

number of non-information (production) occupations in the non-information sectors (primary and secondary).

It was in the manufacturing sector that we first witnessed changes due to information technologies - robotics, precision machining, etc.

The main question for regional analysts, present and future, is whether or not manufacturing activities in the lagging regions will be able to keep pace with these transformations? Or, should they keep pace? There does not seem to be a consensus amongst the experts as to the future of manufacturing activity in the regions. Some say further urban concentration is inevitable, some say telematic networks will allow for more flexibility in location choice, and others predict a whole new operating structure for the manufacturing sector - that being an urban concentration of the information activities with production activities being moved to the peripheral areas. (Lamarche, 1990.) Whatever the outcome, changes due to the deployment of information technologies are imminent. "The viability of regional manufacturing will depend on two principal factors: the nature of the industries ... and the capacity of regional entrepreneurs to develop and maintain strong competitive information networks..." (Lamarche, 1990, p. 44.)

The impacts of information technologies will be even more pronounced in the service sector. As an example, there is data available which clearly proves, contrary to popular belief, "...the massive introduction of office technology has not had the displacing effect on clerical employment that many believe it has. In fact, the biggest impact has strictly been on the increased quality of work that is produced." (Cyert and Mowery (eds.), 1987, p. 89.)

But, it is not only business services that are benefitting. There must also be the recognition that information services and communications infrastructures for consumers, as well as industry, are an extremely important facet of this new economy.

The new (*consumer*) services can be classified into five broad categories: health care services, primary and secondary education services, university and research services, business services to households,

as opposed to services to industry, and recreational and other information services to consumers. Although the labels are familiar, the types of services and their delivery procedures are new. (Lamarche, 1990, p. 87.)

In fact, it might be the consumer services that hold the most promise for regional development.

Information Technology and Regional Development

A major implication of these changes in work, organization, and the composition of the labour force is that firms are faced with new options and new constraints in locating their activities. For the large firm there are opportunities ... to thrust some functions outward ... For small organizations, new alternatives may open up if data base technology and telecommunications make it possible to service broader markets. ... These new options are, ... sufficiently different to bring about important changes over time in the location of service activities. ... An educated labour supply appears to be emerging as a locational factor of major proportions. (Ginzberg, Noyelle and Stanback, 1986, p. 83.)

The regions, therefore, that can provide their workforce with the necessary educational, technical and attitudinal training required by the information technology movement may be best able to compete. The new competitive advantage seems to be human resources, followed by an infrastructure capable of supporting this type of technological development. A region that cannot, or will not develop these capabilities, could potentially condemn itself to life-long disparity.

Telematic networks virtually eliminate any time lags in communication. It is reasonable to assume that it would take no more time or effort to communicate with Sydney, Australia than it would to communicate with Sydney, Nova Scotia. Information technology means the new opportunities for regional development are almost endless. "Global demand for high technology is growing quickly, but the biggest opportunities for Canadians may

be in services. Many economists have pointed out that trade in services is growing faster than trade in merchandise." (Zeidenberg, June 1989, p. 110.) But, it also means that a significant attitude adjustment is required, if any region is to be successful in this new era. (Economic Council of Canada, 1990, no. 2, pp. 5, 7, 9.) By attitude adjustment, I refer to;

*The negative Canadian attitude towards service industry jobs;

*The frequent resistance to retraining and upgrading;

*The attitude towards the slow pace at which we accept change, especially in the regions;

*The continued pursuit of union-jobs in resource industries;

*The traditional confrontational attitude towards labour/management relations; and,

*The reliance on government subsidies and protectionist policies to preserve our relatively high standard of living.

One indication that we are moving in the right direction, is the recent emphasis on local economic development programs. Of course, individual regions in Canada do not have the resources to tackle the world economy independently. Massive restructuring of our education system and retraining programs is necessary in order to prepare our labour force for what lies ahead. As well, the setting-up of telematic networks in the regions will be extremely expensive, and if left to the private sector (as is currently the case in Canada), infrastructure investments will more likely be made in larger markets by large firms. "Telematic services to consumers are almost non-existent in Canada with the exception of two small experimental projects in the Montreal area. Bell Canada is testing its Alex network and another firm is trying to implant the French Minitel system which has achieved quite a success in France". (Lamarche, 1990, p. 4.)

As of January, 1987 only 1% of monies in regional development agreements was earmarked for communications (Lamarche, 1990.) Relatively few funds are available for either public infrastruc-

ture development or for supporting small, private telecommunications companies in the regions. Our government has influenced all other major infrastructural developments across the various regions of Canada - education, health care, transportation, etc., so the question is, why are they now leaving this new and badly needed telematic infrastructure to the private telecommunications firms to implement according to their own agendas?

Without improved regional policies, based on a thorough knowledge of the information revolution and its implications, there is every likelihood that regional disparities will increase, despite the fact that the information revolution carries with it the potential for more rapid development of peripheral regions. (Higgins, in Lamarche, 1990, p. X.)

This statement sums-up the research regarding predictions for the future of regional development in Canada in this new information economy. The potential for real economic development in the regions is tremendous, but there are a number of things that must be achieved before this development can take place, namely: a workforce with the necessary educational, technical and attitudinal training required by the information technology movement; a telematic infrastructure capable of supporting this type of technological development; and finally, regional development policies, at every level of government, which recognize the vital force of the information revolution.

The role of the economic development professional in an information economy

No longer are senior levels of government able to influence the economies of individual communities to the extent that they were perhaps able to in the past. Even the Economic Council of Canada "... questions the effectiveness of ad hoc, bureaucracy-driven plans for regional development ... Policy-makers are now paying more attention to the harnessing of local talents, expertise and resources. The aim is to enable citizens to take charge of the

economic well-being of their own communities." (Economic Council of Canada, 1990, no. 2, p. 8.) Specifically, as the job title suggests, the Economic Development Officer (EDO) is charged with a significant portion of this responsibility, even though economic development is not something that can be accomplished by any one individual.

It is now the internal, competitive strengths of the community that must be supported as the source of community economic development throughout the next decade. "Addressing these issues moves economic development organizations away from site selectors to business advisors that deal with a whole host of issues." (Darragh, 1990, p. 8.) For the EDO, this means practices, priorities and perceptions must change. The job requires training, ethics, experience and interpersonal skills. (Murray, 1987.)

The scope of the EDO's job has changed. Performance measures might be more appropriately based on how the EDO is succeeding in implementing that year's economic plan and how well the community is being prepared for the future, versus the obsolete numeric measures of physical accomplishments and activity reports of the past. Specifically, the EDO's effectiveness will be based on an ability to be responsive to the needs of both the municipality and the business community. To different extent, both are influenced by various economic pressures, but the private sector must react much quicker. Because the EDO's job is tied to these developments in the private sector, the municipality must give the EDO the flexibility to change direction and move at a pace dictated by the client. Otherwise, the community may lose in the long-run.

Although flexibility is needed in order to change the plan of action - the means to the end - the final goal of economic development, must not change.

The EDO must be the advocate of strategic economic planning. The strategic planning process should produce a vision for the community. It is this vision that should guide the EDO and all other decision-makers and local organizations in the community. In general terms, most community's visions include increased prosperity and an enhanced quality of life. But, how will communities pursue their visions?

Communities must look inward and build up their competitive advantages. "Communities, either through the municipal government or through a local group such as an LDO (*local development organization*), should give a high priority to building human-resource and information infrastructures to support private initiatives." (Economic Council of Canada, 1990, p. 11.) "... business will invest and expand in areas that have the necessary labour resources to support their business strategies, ... and, other businesses will find you, if your economy is thriving." (Darragh, 1990, p. 7.) It is not enough to change your external marketing focus from attempting to attract traditional manufacturers to high-tech components manufacturers. As for internal marketing, many local people are unaware of the opportunities. Promoting success stories is a means of educating the community and a means of recognizing the efforts of the individuals that help make a difference.

The EDO will have to shift the focus from creating jobs, to creating employees. Does this mean the EDO will be involved in human resource development and education? Perhaps in some communities, the EDO will be directly involved. In other communities, the EDO may only be indirectly involved through his/her role as vision-builder and catalyst of the development process.

The other key component to enhancing the internal infrastructure is the development of a sophisticated, yet user-friendly, information network. This type of development calls for relatively high levels of technical knowledge on behalf of the EDO. It also calls for a high level of understanding of how the information industry has changed the nature of doing business, and brought down the geographic barriers to external markets.

Of course, the EDO can not set up the necessary human resource training programs and information networks single-handedly. "...more is better when it comes to involving business, community, education and other organizations in the economic development process." (Darragh, 1990, p. 4.) The effort, however, is often initiated and coordinated by the EDO.

Concluding Remarks

Information technology and niche marketing are the new developments that provide phenomenal opportunities to the economies of our regions. Economic development is by no means a 'given', however.

The impact of the information revolution on regional development is not yet altogether clear, but results to date provide ample reason for concern, constant monitoring, and preparation for government intervention if the net result is obviously harmful. A recent OECD report states bluntly that the new technology-based industries tend to be concentrated in a few regions of each country, and the development of the new information technologies has greatly benefited the richer regions at the expense of the poorer ones. (Higgins, in Lamarche, 1990, p. X.)

Revolutionary government policy, human resource development, and telematic networks are the three key ingredients necessary if the regions of Canada are to even stand a chance at competing in this information economy. Are we headed in the right direction? Only time will tell.

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