

CHAPTER 14

COMMUNICATIONS

Canada's geography and history have made it a pioneer in communications. The need to link widely separated population centres across a vast landmass has meant that the nation's development, even its survival, depended first on efficient transportation and, later, communications.

Enormous changes in the Canadian communications system have been precipitated by the synergy between developments in computer and communications technologies. Thus the new information technology is making a sweeping impact on Canada's social, cultural, economic and political fabric.

On the eve of World Communications Year, 1983, Canada was in a position to contribute to the challenge of promoting the development of a complete worldwide communications network, because of its expertise in communications technology. During 1982, however, the rate of technological change was tempered by the problem of world economic hardship and restraint, with unprecedented high unemployment and inflation.

In Canada, despite this economic climate, significant gains were made in response to the needs of the information society. Canadian leadership was enhanced in areas such as office communications systems, Telidon applications, optical-fibre technology, space research and its applications.

Canada celebrated 20 years of space research and achievement in September 1982 and formally welcomed proposals from the US National Aeronautics and Space Administration (NASA) concerning the participation of the first Canadian in space.

14.1 Communications revolution

The first major thrust in the technological revolution has been the evolution of computers into all-purpose machines of soaring capabilities and falling cost. Semiconductor technology has shrunk computers in size and dramatically increased their cost/performance ratios. For the past several years, computer technology has played a growing role in communications. For example, Canada has two of the most sophisticated digital data communications networks in the world. Telephone companies have been installing digital multiplexing switches in their central offices and electronic telephone sets in homes and offices.

Second, new distribution technologies such as fibre optics are beginning to expand the carrying capacity of Canadian telecommunications systems. Fibre optics cables, composed of fine strands (or fibres) of ultra-clear glass through which high-frequency light waves are transmitted, can carry 10,000 times more information than conventional copper wires of equivalent cost. Canada has been one of the first countries to test this new technology under a variety of conditions for different purposes.

Most powerful distribution technology of all is the communications satellite. Canada has been among world leaders in its deployment. Satellites act rather like huge microwave towers in the sky and are used for long-distance voice, video and data communication. In contrast to costs for microwave transmission, those for satellite transmission are the same from Montréal to Vancouver as they are from Montréal to Toronto, abolishing distance as a meaningful concept in communications. Until the launch in January 1976 of the experimental Canadian-American communications technology satellite, later named Hermes (see also sections 14.2.2 Telecommunications networks and 14.5.1, sub-section Space), these satellites were essentially low-power, requiring large, expensive earth stations or antennas to pick up their signals and thus limiting access. According to the Science Council of Canada, the significance of Hermes and its successor, Anik B, is their high power; their earth stations can be relatively inexpensive and portable, making their signals more accessible. Low-powered parabolic dish receivers, to sell for about \$200, have been designed in Canada and other countries, notably Japan.

Canada's success in taking advantage of the new information technologies, and avoiding reliance on imports, with a consequent loss of industry and jobs, depends in part upon the capabilities of the Canadian communications system. It is no longer possible, as it was 10 or 15 years before, to distinguish between the technologies of telegraphy, telephony, radiocommunications and computers. All are used in almost every mode of telecommunications.

14.2 Telecommunications system

The Canadian telecommunications system comprises all the networks, equipment and services provided by