ANGUS
TELEMANAGEMENT GROUP

TELECOMMUNICATIONS AND BUSINESS COMPETITIVENESS IN CANADA AND THE US

Submitted to the
Department of Communications
and
Industry, Science and Technology Canada
of the
GOVERNMENT OF CANADA

by

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DEDICATION

This study would have been impossible without the co-operation of the many knowledgeable individuals who participated in the interviews, conducted in February and March of 1992.

The participants were telecom and information technology managers, network planners, and business executives in 65 companies located across Canada and the US. They represent businesses of all sizes, in a wide variety of industries.

They shared their experiences and time generously, often taking additional time to confer with other colleagues in advance to make sure their information was complete.

Many of the Canadian respondents, in particular, welcomed this opportunity to express their views and make their concerns known. "We're glad that the government is asking for our input," was a frequent comment.

They provided a wealth of information on the many ways in which telecommunications is woven into the fabric of today's business endeavors. They leave no room to doubt that telecommunications is a key competitive resource for the companies who are building tomorrow's economy.

— Lis Angus (Angus TeleManagement Group)
and
— Wendy Cukier (Ryerson Polytechnical Institute)

March 31, 1992

NOTE ON TERMS AND ACRONYMS

A number of telecommunications terms and acronyms occur throughout this report. While every attempt has been made to explain new terms as they appear, in many cases repeated explanations would interrupt the flow of the material. To assist the reader, many of these terms are defined in the Glossary on page 74.

A. EXECUTIVE SUMMARY

> *"A new vision for the Canadian economy is needed, one in which...firms and governments focus on creating advanced skills and technology, in which sophisticated home demand drives more firms to create advanced products and processes, in which many more Canadian firms compete globally, and in which competition provides a key stimulus for continual upgrading....Firms in Canada need to employ different and more effective strategies, rely on more advanced methods and technologies, and migrate into more sophisticated segments of their industries."* – *Michael Porter,* **Canada at the Crossroads: the Reality of a New Competitive Environment**, *Oct. 1991, p. 72.*

The current study was undertaken to explore the ways in which telecommunications affects the business activity – and competitive ability – of Canadian companies.

A sample of 65 Canadian and US businesses, representing a broad spectrum of company sizes and industries and doing business across the continent, were interviewed in February and March 1992. (The US sample was included to provide some perspective on the Canadian views.)

The results show that there is both "good news" and "bad news":

The good news is that many Canadian companies, in a wide range of industry segments, are using telecommunications in innovative ways to improve the effectiveness and competitive position of their companies.

- Many of the organizations interviewed – small and large – consider telecommunications to contribute significantly to success within their industry.
- Telecommunications plays an important role in allowing companies to exchange information with customers and suppliers, as well as to communicate effectively within the company. Effective use of telecommunications to transport information is very important for most companies – and may be strategic in its impact on the company's competitive position.
- In many firms telecommunications is more than a transport medium: it forms *part of* some or all of the services and products the organization produces. Even firms in such "hard" industries as manufacturing and resources are increasingly providing "service" products – on-line tracking of customer orders, for example – to gain competitive advantage in their industry. Telecommunications is often the key enabler of these service products.
- Most respondents identify "customer service" as a major factor contributing to success in their industry. Customer service, in most companies today, is facilitated by telecommunications.

The bad news is that most of the Canadian companies interviewed consider their effective use of telecommunications to be significantly hampered by higher prices

and fewer services than are available to their US competitors and counterparts.

- Firms in nearly every industry segment, and in all size ranges, say that they need **lower telecommunications costs** to allow them to offer increased customer service, expand into new markets, and compete more effectively with US firms.
- Several Canadian respondents stated that high telecommunications costs and delays in service introduction have affected their business decisions in the past two years, by slowing the rate of innovation.
- A number of Canadian firms stated that, at current disparities in telecommunications costs in Canada and the US, they are seriously considering having to move some or all of their most telecom-intensive operations to the US. Others stated that proportionately higher Canadian telecommunications costs will force them to migrate their corporate growth – and new jobs – to the US.
- The topology of some Canadian firms' networks, and the mix of services they choose, also reflect the different price structures in the two countries. In the US, where T-1 circuits are priced much lower than in Canada, and Virtual Private Networks are readily available, firms can implement on-line applications "in the blink of an eyelash" while comparable firms in Canada make do with low-speed dial-up data links to serve the same function.

Small firms in each sector report that they face similar competitive challenges to those faced by larger firms in the same sector. Small firms – as well as large ones – are using telecommunications to improve their business competitiveness.

However, many small firms do not have someone on staff whose job it is to learn about new technologies or services and apply them to the business. For small firms it is often "the luck of the draw" whether or not they happen to have a staff member who can think of innovative ways to use technology to solve business problems. Larger firms can often devote more resources to exploring new opportunities.

Companies in Canada and the US describe the key success factors in their industries in similar ways, and have similar views on how telecommunications contributes to these success factors. However, a number of the US firms interviewed are gaining experience with technologies which are not yet available to Canadian businesses: in particular, *virtual private network services* as well as *ISDN* and *frame relay*. Even after these services are introduced in Canada, Canadian firms will face a catch-up period as they gain experience with these technologies.

More of the US firms appear to view themselves as operating within a global context; they discussed the need for global networking and advanced features in international telecommunications. In contrast, most of the Canadian respondents talked about services within Canada or to the US, rather than internationally. Most of the Canadian firms stated that they face competition within Canada from US

firms, but fewer are themselves competing in the US or global markets.

All grass is not necessarily greener south of the 49th parallel. US respondents expressed their share of complaints, too. In particular, firms located in less urban areas (for example, northern Idaho and Maine) complained that they have few services and high prices. Though most US respondents said that their long distance costs are "reasonable", several expressed the view that they would like to see competition in local service in order to bring the price down. In general, however, US respondents think that their telecommunications costs are lower than in Canada or Europe, and most are happy with the range of services available and the rate of new service introduction in the US.

Apart from lower costs (particularly for T-1 and 800 service, as well as for regular long distance voice calling) Canadian respondents would like to see many changes in their telecommunications service. Some highlights include:

- less delay in bringing new services to market.
- quicker approvals from the CRTC for new services.
- more consistency in services, pricing levels, and billing practices across the country.
- more flexible and informative billing from the carriers, including combined billing for multiple locations.
- more flexibility in 800 services. (Many of the items on the "800 wish list" are reflected in the Bell Canada 800 restructure approved March 19 – though the new rates are still significantly higher than US 800 rates – and the additional 800 service features which Bell has filed. Customers across the country would like similar features.)
- ISDN, both Basic Rate and Primary rate. These are wanted in particular by firms with incoming call centers, such as airlines, catalog sales companies, and fast food operations. Many businesses are waiting to use features such as network-wide calling number ID, as well as faster call setup times between networked customer switches, which ISDN and Signalling System 7 make possible.
- high bandwidth data links at affordable prices, whether dedicated or "virtual". Requested services include Switched 56, Switched 384, Switched T-1, and Frame Relay. These are particularly important for companies in retail, insurance, financial and publishing industries.
- much more knowledgeable sales and service representatives from the carriers. Customers across the country and in all size ranges feel that the level of customer service provided by the carriers is low. (However, this varies from customer to customer – some customers are very happy with their carriers' customer service.)

Canadian customers give high marks to the carriers' transmission quality. US

respondents similarly say the transmission quality in US networks is excellent.

Representatives of Unitel and Bell were asked for their views of the reasons for higher prices and fewer services in Canada, and the prospects for the future.

Bell Canada says that:

- Historically, Canadian long distance prices have remained high because they heavily subsidize local service.
- With the deployment of Signalling System 7 across the Canadian public network, new services can now be rapidly introduced which use the intelligence inherent in the network.
- The underlying cost of providing T-1 and other dedicated lines remains higher in Canada than in the US, and accordingly T-1 prices will remain higher than the US, though Canadian prices have been reduced from the levels of a few years ago.
- Bell's cost per minute on the *switched services* carried over the network is now as low or lower than any carrier in North America. Accordingly the price of switched long distance services can fall significantly. Bell hopes to migrate many of its high-volume users to Virtual Private Network services for both voice and data applications – gaining the benefits of private networks while riding on the low costs of the switched network. However, large customers will use hybrid networks (a mix of dedicated and switched services) through most of this decade.
- Bell also says that it will be looking for ways to increase its revenues from local service. In addition to new revenues from optional local services, basic line rates may have to be increaased, depending on the extent to which competition in long distance affects the sustainability of the contributio from long distance to local service.

Unitel does not fundamentally disagree with Bell's view of the economic issues in Canadian networks:

- Unitel agrees that the cost of providing dedicated T-1 service is higher in Canada than the US, and believes that Canadian T-1 prices can not fall much further. In Unitel's view, US *costs* of providing T-1 service may be marginally less than the costs in Canada, but US *prices* are substantially lower because American T-1 rates need only recover forecast incremental costs.
- Unitel agrees that the economies of switched service are favorable in Canada. Unitel believes that it is possible today for a relatively small carrier to deliver switched long distance service at as low a cost as a larger one. It is this view which underlies Unitel's application to offer switched long distance service in Canada.
- Unitel does not have a position on the level of the long distance subsidy of

local service: it says this is a public policy decision. However, if a reduction in the subsidy level did occur, this would reduce or eliminate the "contribution fees" which Unitel, in its current business plan, assumes it will have to pay to the telephone companies as its share of the subsidy if it is allowed to offer switched long distance services.

Based on input from the interviews with business users and carriers, we suggest the following recommendations for the Department of Communications to consider in formulating its policy directions:

1. Priority should be placed on significantly **reducing the overall prices of long distance services** to Canadian customers, across all services, in all provinces, and for all sizes of organization.

   We make no recommendation on local service pricing; we believe this requires further study. Certainly there will be objections from both residential and business users if local rates go up. For many small and medium businesses, local service is at least as important as long distance service, and increased costs in this area would inhibit their growth.

2. Equal priority should be placed on **reducing the time required to introduce and approve new services,** both at the *carrier* level and the *regulatory* level.

   Carriers should be encouraged to provide innovative services based on customer input. Greater consistency in services and pricing structures across the country should be encouraged, so that businesses can use similar approaches in choosing services, wherever they are located in Canada.

   The new Telecommunications Act (Bill C-62), if passed, will introduce greater regulatory consistency across the country, and will allow the CRTC to forbear from regulating markets which in its judgement are sufficiently competitive to warrant deregulation. However, additional measures may be required to speed up approvals for services in markets where the CRTC has not elected to forbear from regulation.

3. Encouragement should be given to activities which **assist businesses** – in particular, small and medium businesses – **in understanding the available technologies and how they can be applied** in creative ways to make the businesses more effective and productive. Useful educational activities could include seminars and demonstrations; they could be organized by government bodies, suppliers, user organizations, or any of these working together in combination.

A. INTRODUCTION

Over the past two years, Canadian business telecommunications users have become increasingly vocal in demanding lower prices and increased service innovation in telecommunications, particularly in long distance services.

Submissions to the CRTC's public proceedings on long distance competition (both verbal and written) revealed a widespread perception by Canadian business organizations of all sizes that their US competitors have access to a wider variety of telecommunications services, at substantially lower cost. They argued forcefully that this disparity needs to be eliminated if Canadian businesses are to compete effectively in a global marketplace with their counterparts in the US and elsewhere. (Excerpts from some of these submissions are provided in Appendix 6.)

A number of research studies have substantiated the accuracy of these perceptions of higher telecommunications prices and fewer service options in Canada. (See Appendix 5 for a summary of relevant studies.)

The Department of Communications is faced with the task of developing policies to shape the Canadian telecommunications infrastructure through the rest of this decade and into the next century. This infrastructure has to meet the development needs of the Canadian economy as a whole, and Canadian businesses individually.

Information on the impact of telecommunications on Canadian business organizations, and their ability to compete in the global market, has remained mainly anecdotal. No systematic comparative study has previously been conducted to show how Canadian businesses are affected by the differences in service availability and costs between Canada and the US. The current study was undertaken in order to fill this information gap.

CONTEXT: THE CHANGING NORTH AMERICAN ECONOMY

US sources indicate that the increasing demand for state-of-the-art telecommunications services and lower prices is not confined to Canadian businesses. Over the past decade, US businesses have demanded (and continue to demand) similar shifts, in part as a result of the following factors:

- Many manufacturing industries, particularly those relying on mass production, have shifted out of the US to low-labor countries.
- In response, American businesses have needed – and still need – to become more productive in order to compete globally. The option of reducing US wage levels to match offshore rates is not politically feasible – so the alternative option is to use technology to increase the productivity of the higher-paid US labor force.
- The convergence of computer technology and telecommunications technology is creating the possibility for productivity enhancements which

did not exist a decade ago. This is true for the telecommunications network infrastructure, as well as for equipment and services which individual companies and subscribers may lease or own. Some of the innovations which telecommunications makes possible include: automatic teller machines, videoconferencing, computer-aided design and manufacturing, telecommuting from remote locations (homes or regional offices), voice messaging, automated ordering or registration services, and many others.

Both American and Canadian producers are finding that, to survive in an increasingly global marketplace, they need to be able to respond quickly to changing markets, reducing the time between design, production, and sale. They need to offer their customers quick and easy access to sales and customer service staff, and these people in turn can contribute more to the organization if they can interact regularly with engineers and product development teams. Managers at all levels need quick access to market information.

Telecommunications is a vital component in this process. It has been argued that the telecommunications infrastructure will be at least important to economic development in the century ahead as the establishment of continent-wide railroads and road systems was in the last century.

THE ROLE OF GOVERNMENT

The Department of Communications is responsible for formulating telecommunications policy in Canada. Policies established by the DOC will directly influence the future of the telecommunications infrastructure in Canada.

Policy makers face the challenge of balancing social, political, and economic concerns. The following policy goals have all been advanced by many participants:

- promoting economic efficiency by reducing the price of telecommunications as a factor cost;
- fostering network innovation and the creation of new services to enhance economic productivity;
- protecting universal service;
- using telecommunications to promote economic development in other ways (i.e. regional development, job creation)

Even defining the content of these goals is not easy. For example, what is universal service? Does it refer to 'dial tone' only? Or does it mean that all subscribers will need to have access to ISDN, on-line information, and other advanced services? Should rural users – including businesses who locate in remote regions to create jobs and achieve other savings – have access to the same services as urban users, at the same prices?

There are other questions, such as how quickly should state-of-the-art technologies

be integrated into the public network? Who should finance this innovation: shareholders? subscribers? subsets of subscribers? Should these be explicit policy and regulatory decisions, or should they be left up to the marketplace?

The nature of the regulatory environment itself is a policy issue. Certainly concern has been raised, by industry participants as well as by regulators, over the costs inherent in the current regulatory regime. These include not only the increasing cost of regulatory staff, but the costs to other participants, including the cost of legal representation in the adversarial process, and the opportunity cost of delays in introducing new services while regulatory approval is sought.

Government also shapes the industry in its role as a large telecommunications user and service purchaser. Telecommunications may be used:

- to reduce the cost of providing existing government services (by speeding up service delivery, or by consolidating network costs across services.)
- to provide new services which could otherwise not be delivered (e.g distributed information resources)

Both may significantly affect the development of the telecommunications industry and infrastructure, by stimulating investment and service development by carriers eager to obtain government business.

THE CURRENT STUDY

The current study was undertaken in order to provide a clearer picture of the impact of telecommunications on businesses in Canada. The study was designed to examine the telecommunications needs of Canadian businesses of all sizes – particularly those for whom telecommunications is a key input to their current operation and future plans.

B. STUDY OBJECTIVES AND APPROACH

1. Objectives

The purpose of this study was to elicit the views of Canadian businesses on how telecommunications affects them, as well as their views on telecommunications costs and services in Canada. In particular, the project was designed to obtain information on how telecommunications costs and services relate to the ability of Canadian-based businesses to compete effectively with US-based firms.

The project definition included focusing on "telecom-intensive" organizations: i.e. businesses for whom telecommunications is important to how they do business.

In order to put these views in perspective, the study also explored the views of a similar sample of US-based businesses on the same topics.

2. Approach

Information was gathered through individual interviews, in order to encourage richness of description and variety of response. Each interview lasted between half an hour to an hour, and was conducted by telephone.

Representatives of 35 Canadian companies, and 30 US companies, were interviewed. The sample was designed to be as broadly representative as possible. It included small, medium and large companies in each country, representing a variety of industry sectors. So far as possible, the US and Canadian samples were matched so that companies of similar size within each sector were interviewed.

Respondents were also geographically dispersed. The Canadian sample included companies located in each province except Prince Edward Island. (See Appendix 4 for a more complete description of the characteristics of the sample.) The US companies interviewed were similarly distributed across the country, located in states in the east, southeast, central, southcentral, midwest, northwest and southwest parts of the country.

(Government, health, and educational organizations were excluded from the sample – even though these are often telecommunications-intensive organizations – because the question of being competitive is more nebulous to define in their case. The sample was restricted to organizations whose objective is to make a profit, and which are subject to competitive pressures in their markets.)

Readers should keep in mind that this type of sample is broadly "representative" (because it is constructed to be so) but is not intended necessarily to represent the *average* or *typical* business. The value of this type of study is the range of qualitative

information obtained; it is not intended to produce results statistically generalizable to the entire business population. In the following sections, occasional numeric summaries of responses are presented; these should be taken as descriptive only. Interviews with other customers could potentially have produced different results.

C. ROLE OF TELECOMMUNICATIONS IN BUSINESS

1. Overview

The role of telecommunications networks and services in today's economy is often compared to the role which railroads and highways have played in the past. Certainly "transport" is one of the functions of telecommunications: high-speed, reliable movement of information is increasingly important as the global economy becomes a reality. Companies are increasingly looking for ways to use telecommunications to gain an advantage by getting their products to market more quickly and cost-effectively.

But in conducting the interviews for this study, it became very clear that telecommunications is starting to play more than a simple transportation role, where *what* is transported is separate from *how* it is delivered. (A box of detergent is a box of detergent, regardless of whether it is delivered by rail, truck, airplane or dogsled.)

In contrast, without telecommunications, many of the products and services of the companies interviewed would be different (and less useful) products. The boundaries between product, service, and operations are blurring.

Increasingly, in many industry sectors and in companies of all sizes, telecommunications is becoming an integral part of some or all of many companies' products. It is these companies who are – in Michael Porter's words – coming to "rely on more advanced methods and technologies, and migrate into more sophisticated segments of their industries."

- In some industries (for example, in banking) telecommunications is a clear component of the service being sold. Banks which cannot offer on-line account information and instantaneous transfer of funds do not keep customers. A bank without Automatic Teller Machines would quickly lose market share.
- In many other industries – such as hotels, airlines, and catalog sales – telecommunications is an essential part of the selling process, whether through outbound calling or through receiving inbound orders by phone. "If we don't answer that call, the sale goes to someone else," was a view expressed by respondents in a variety of industries. Despite consumer objections to some types of outbound telemarketing – particularly when the calls are generated by a computer – many industries do use telemarketing very effectively. The travelling salesman has been replaced by the telephone, primarily because telecommunications can reduce the per-item cost of making the sale.
- In fact, telemarketing has become an industry itself. Many retailers do not maintain their own call centres, but instead contract with a telemarketing

service bureau to fulfil this function. (Calls elicited by late-night TV ads for knives or car seats, with an 800 number and a reminder that "operators are standing by," are often answered by such a telemarketing service bureau.) One such firm uses Interactive Voice Response to develop inbound telemarketing applications for promotions and contests on behalf of large consumer goods companies. Said the respondent: "Many people are now more comfortable using the phone than a pen."

- In many companies, telecommunications is used in creating the product, whether through Computer Integrated Manufacturing or collaborative design. Often the design team is geographically dispersed. One respondent said "Products are not developed in one place," and this view was repeated not only by other large manufacturers, but by professional services firms (e.g.law and consulting firms).
- Telecommunications is also key in many companies' distribution and inventory management systems. For example, a sale rung up at a retail chain's "cash register" (really a computer terminal linked to the corporate mainframe) can simultaneously update the inventory records for that product and trigger an automatic re-order from an outside supplier when the stock level falls below a pre-set threshold.
- Some products are actually delivered by telecommunications: for example, on-line information services, messaging services, fax versions of publications.
- Most respondents identify "customer service" as a major factor contributing to success in their industry. Customer service, in most companies today, is facilitated by telecommunications.

Virtually every respondent interviewed, in both Canada and the US, regardless of their size or sector, said that telecommunications services play an important role in their business.

> *"We could not exist without telecommunications. If need be, we could do without our computer – we could do things manually if we had to – but without telecommunications we are out of business."*
>
> *"People who have dealt with us before call us again. But if they can't reach us, they call somewhere else. If you service them, they'll be back, otherwise not."*
>
> *" The phone centre is the nerve centre of the company. If a call is not answered it goes to a competitor. Customers will not wait and call later. And down the road the customer will likely call the competitor again rather than us."*

For some, telecommunications is critical to managing inventories and supplier relations. Others maintain that telecommunications plays a major role in administering their business. None of the respondents interviewed for this study thought that telecommunications is unimportant to their business.

Later sections describe in some detail the degree to which telecommunications plays both a "highway" function and a "product-integrated" function for businesses

in Canada, and for their counterparts in the US. Where differences were apparent, based on company size, industry, or country, those differences are described.

First, however, it may be helpful to consider some examples of the innovative ways in which companies are using telecommunications to increase their effectiveness.

2. Examples of Key Applications

RETAIL SALES TRACKING AND PRICE ADJUSTMENT

One Canadian retail chain reports that 85% of their invoicing and price listing are now electronic. The head office captures daily information on item movement at all its stores by automatically polling each store's computer. This information is analyzed and detailed reports are sent back to the stores and franchisees. Sales are tracked by product, by store, and by historical trend. Competitor's prices are researched and transmitted to the corporate office. Prices are constantly adjusted to be competitive, and new prices are transmitted by computer to every store. Some of the stores are equipped with electronic price labels on the shelves, allowing real time price updates to take place automatically by wireless transmission from the store's computer. In some markets, prices are changed five times a day. FM scanners are used in each store to scan the bar code and the quantity on the shelf, which is communicated to the store computer and input to the order process. The chain uses the combined purchasing power of all its subsidiaries and franchisees to negotiate lower prices from suppliers, and the movement of information in a decentralized operation is essential to do this. The information collected and analyzed provides important marketing information about the movement of goods, and helps them formulate appropriate strategies.

> *"Telecommunications is critical to us. Daily item movement, price changes etc. must be communicated quickly between stores. The key to keeping costs low is minimizing inventory – at the store level and the warehouse level. Just in time ordering is a big part of how we operate. Often a shipment arrives in the warehouse in the morning and is out by the afternoon."*

ELECTRONIC ORDERING, CREDIT AUTHORIZATION

A US retail chain has a leased 56 Kbps line connecting directly from its head office to one of its suppliers, as well as between each of its stores. Daily sales of that supplier's products, for each store, are transmitted directly to the supplier, who replenishes at the store level. Four other suppliers are updated weekly; the chain's computer automatically generates a purchase order for replenishments, and transmits it directly to the supplier's computer. (Computer-to-computer ordering is one example of Electronic Data Interchange, or EDI.) The chain's buyers have access to terminals connected to the computer of a purchasing co-op which does central buying in the Pacific Rim; orders are placed by electronic mail. Batch processing is done every night, to subtract sales from inventory, charge sales to credit card balances, and update all records. Credit card verification is also done automatically.

"Consider the volume: on the day before Christmas, in one hour we handled 82,000 transactions. We take pride in being able to do In-house inquiry for credit verification (for charges to our own cards) in 2 seconds. External cards take longer but we use leased lines to speed that up. We couldn't do it over dial up lines: customers wouldn't accept the delays."

COMPUTER-TO-FAX ORDERS AND NOTIFICATION

Companies in several industries, in both Canada and the US, have automated their order placing process, even though they have suppliers who are not equipped to receive them by computer-to-computer communications. Most suppliers have facsimile machines, however. So the orders are placed by mainframe-to-fax: the purchaser's mainframe computer generates the purchase order and sends it out as a fax image. Examples include:

- A Canadian reservation centre serving a variety of small hotels and inns uses this technology to inform each of them of bookings. When the reservation is recorded on the reservation agent's terminal, a push of a button delivers a fax directly to the hotel.
- A Canadian manufacturer has recently installed a system to use mainframe fax to receive quotes from suppliers and to generate purchase orders.
- A US retailer places all its orders by EDI, except with some suppliers who don't have compatible computer systems. For those, the retailer's mainframe computer generates a purchase order and sends it by fax.
- An answering service offers its customers the option of being notified of messages by fax. When the message is taken, the information is entered on a computer terminal; the agent can push a button to deliver the message by fax. When the customer gets back to the office, their "pink slips" have come through on the fax machine.

WIRELESS COMMUNICATIONS FOR AIRLINE OPERATIONS

Airline maintenance staff use radio and other wireless technologies to communicate between crews working on the wing or the engine and customer service agents inside the airport. Radio and satellite links are used for air-to-ground communications between flight crews and ground crews. Air-to-ground service is now available from some airlines as a passenger service on some planes, as well.

TERMINALS IN CUSTOMERS' OFFICES

One Canadian insurance company, which provides group insurance to many organizations, will soon provide on-line access to its databases to some of its group customers. Administrators on the customer's staff will be able to update employee profile information and process claim payments on behalf of employees. This will reduce the insurance company's workload, and will speed up service to the customers.

TELEMARKETING TO REINFORCE MAIL PROMOTIONS

Tourist organizations receive inquiries from people interested in certain types of travel. With the recession, tourism has been in a slump. One small organization decided to send customized letters to prospects based on the type of travel in which they had expressed interest – and which had been captured on a database at the time of the original call – and then followed up with a personalized phone call. Over 50% of these calls resulted in bookings, and for longer-than-average stays because the telemarketers were trained to offer additional information about the local attractions.

CUSTOMER SERVICE APPLICATIONS

Telecommunications is used by a wide variety of organizations to give their customers better access, and to improve the company's ability to serve customers. Examples include:

- One hotel chain has a special 800 number that goes directly to the President's Office for people to call if they have any problems. All calls to that number are handled promptly and courteously.
- Several hotels have "frequent guest programs". When these guests check in, their preferences (smoking or non-smoking, type of bed, newspaper preference) are immediately available from the main computer, where they were transmitted when the guest stayed at another hotel in the chain.
- One publisher receives three million calls a year from customers, and views these calls as a key opportunity to meet these customer's needs.

  "The three most important success factors in publishing are customer service, customer service, customer service"

GEOGRAPHICALLY DISPERSED WORK GROUPS

A number of industries – for example, aerospace and consulting – make use of decentralized work groups to collaborate on projects. Work teams can be assembled based on who is best for the job, not who already lives in the same city or can be persuaded to move. Depending on the nature of the project, the team's work may be conducted with a mix of voice, data, and image technologies. Quality products and services can thus be delivered more effectively, in less time.

TRANSMITTING ARTWORK TO PRINTERS

Advertising and publishing both require camera-ready art for the printer. Examples of using telecommunications to deliver artwork electronically, thus increasing speed and accuracy:

- A major Canadian newspaper transmits the entire issue nightly by satellite, thus enabling it to have national presence without the delays inherent in shipping from a single printing location.
- A US retailer plans to begin sending advertising copy directly to newspapers

in each city where it has a store – or, if the newspapers are not equipped to receive artwork electronically, the image will be transmitted over a 56 Kbps line to the nearest store and then taken to the newspaper.

- A US publisher uses high-speed fax to transmit camera- ready art, galley proofs, and advertising to printers all over the world.

GATHERING INFORMATION ELECTRONICALLY

Some examples of companies who use information obtained electronically to develop or deliver services:

- Publishing firms use on-line databases for literature reviews and wire service stories.
- Writers gather information on the phone or from databases, and transmit their articles to publishers from geographically diverse locations.
- Law firms use legal databases to search for precedents and case law, and for title searches.
- Airlines receive weather information electronically.
- Telemarketing firms receive client databases on-line.

TRACKING ORDER PROGRESS

Customers often want to know whether an order is on schedule. A company that can give its customers accurate and immediate information on the progress of the order often has an advantage over competitors with less sophisticated systems. A number of couriers and trucking companies have installed systems which constantly update a central depot about the location of a given parcel or truck. Manufacturing is also finding that such tracking is increasingly important. In the words of two Canadian manufacturers:

> *"Part of our service is letting customers know where their order is at any given time. We have a very sophisticated tracking system. Anybody can go on screen and know where a given product is in the production process."*
>
> *"We are implementing a Computer Integrated Manufacturing system, which will include scheduling information, tracking, certification information, etc. So providing current information on status of jobs can become part of the service to our customers."*

VANITY NUMBERS

In some cases, "vanity numbers" are used to facilitate customer calls. These numbers – usually spelling a company name or product – become identified with the company, and become, in effect, part of the product. As one respondent said:

> *"Our phone number is [our company]. We're married to that number. It's how customers remember to call us. It's very important."*

REMOTE MAINTENANCE AND SUPPORT

Many suppliers of high-tech products (for example, computers and telephone systems) provide remote maintenance on systems at their customer premises. This occurs either by the equipment detecting that it has a problem – and automatically dialling the service centre for a maintenance call – or by the maintenance centre dialling in to the customer equipment to perform remote diagnostics. Often if a problem arises, it can be solved remotely, too – without the customer even having been aware that there was a problem. Some suppliers of software-controlled products download new software changes to customers by telecommunications.

WORK AT HOME OR FROM REMOTE LOCATIONS

One large Canadian manufacturer now has about 1,000 people who work out of their homes or from customer locations, some or all of the time. This reduces some costs associated with providing office space, though telecommunications costs are incurred to give these employees access to all customer databases and central voice messaging. A Canadian insurance company also has some of its employees working from home, mainly as claims approvers. This allows employees some freedom in structuring their work schedule, and also means that commuting time is less of a factor in their choice of residential location.

VIDEOCONFERENCING

For some companies, videoconferencing is not just a "nice to have", but an essential part of how they do business. Some are using it as an alternative to travel; others are using it to have meetings which otherwise would not take place at all. For example, one Canadian manufacturing company schedules a weekly videoconference which allows one of its vice presidents – heading up a US subsidiary company – to participate in the weekly executive meetings.

> *"He has a major impact on how things run in the company; we need him in those meetings. Maintaining the information flow is important."*

LINKING PROFESSIONAL SERVICES OFFICES

A large US professional services firm, with offices around the US as well as in other countries, has in the past six months linked about 30% of its US offices with frame relay technology (on a virtual private network service) in order to provide company-wide voice messaging and access to corporate networks. The other locations are linked over dedicated T-1 lines, but the company intends to replace all of these with frame relay as quickly as possible. They will also be adding LAN connectivity and mainframe connectivity over frame relay, and plan to be a beta test for international frame relay providing similar service between its offices in Europe and the US. This is interesting, both because the company is planning to abandon dedicated T-1 links in favor of virtual private network service – at a time when many Canadian firms are still wishing they could afford T-1 – and because of the firm's strong belief that this commitment to technology will give it a competitive edge:

"Telecommunications is our front line capability to be responsive to our clients. We have to be easy to reach, and we have to give quick and accurate answers to our clients. This means that all our staff need quick and easy access to the information needed. Telecommunications is the enabling technology by which the reachability and the personal touch is provided to clients. The objective is seamless communications, giving us 100% reliable desktop to desktop communications. The services have to be non-volitional: in other words you don't have to go and check whether you have a message, you are informed of it. If you receive an e-mail message, it notifies you inside your current application, and you have the alternative to answer it right away or not. Any products which can help us deliver that seamless communications more smoothly or cost-effectively will be positive for us."

3. Competitive Success

Most companies, in most sectors, mentioned *customer service* and *cost control* among the top three factors contributing to competitive success in their industry. In almost every company, telecommunications contributes to the success factors, although there were clear differences in its importance and centrality.

a) Sector Comparisons

While some cautious conclusions may be drawn about the role of telecommunications in various industry sectors, it is important to emphasize that there were major differences within the sectors. A computer manufacturer with an extensive sales network operates, in many respects, more like a retailer than like a steel manufacturer. Similarly, a book publisher's business is different from that of a newspaper publisher. An oil company which operates retail sales outlets is different from an oil company which focuses on exploration.

In some respects the competitive factors are related to the functional areas of the company as well as the particular vertical market. In many ways, an airline with its heavy dependence on reservation systems has much in common with a hotel in the hospitality segment, although oil prices and scheduling are also critical as they are in other transportation industries. In order to draw clear conclusions about particular segments it would be necessary to have finer distinctions within categories as well as a larger sample.

The "key success factors" vary between sectors, but the top indicators are similar among industries. There is some evidence to suggest that in industries where customer service is the main driver, telecommunications is particularly important.

Respondents in many sectors, even commodity production, echoed the sentiment that "We must be reachable or our customers will go elsewhere."

Appendix 5, which summarizes information from a number of other studies, provides additional information on the role of telecommunications in several of these sectors.

MANUFACTURING

The success factors in manufacturing are related to the product being manufactured. For example in high tech industries, product innovation is more important than in the steel industry. Nevertheless, while they rate these factors differently, the manufacturing respondents indicated that the key success factors include:

- Product innovation
- customer satisfaction
- product quality (particularly in a commodity market)
- cost control
- productive staff
- proximity to markets

Several also said that overall economic growth affects their customer's financial health and thereby their own market.

To some manufacturers, product innovation and product quality is paramount, while others are more dependent on marketing and merchandising.

Telecommunications has an impact on most of these areas, although the extent to which it is important depends on the industry. For example, in steel, telecommunications is not part of the product but is important in terms of keeping staff productive – they must be reachable by phone – and in facilitating customer service. In industries such as computing and aerospace where technical innovation is critical, telecommunications is part of the design process. Most manufacturers said that service to customers is a critical success factor, to which telecommunications makes an important contribution.

Typical Applications

- ☐ Electronic Data Interchange to link companies with suppliers and customers using a variety of value added networks
- ☐ Just in Time Inventory Management to link dealers to manufacturing
- ☐ Teleconferencing/groupware to manage decentralized teams

FINANCE

In the finance industry the emphasis is on:

- customer service
- cost control
- product differentiation

Financial companies were unanimous in maintaining that telecommunications is essential to their competitiveness. Increasingly, the services they provide use telecommunications – for example, automatic teller machines, electronic funds transfer, interbranch banking. Speed and accuracy in transaction processing, and reducing the cost per transaction, are of key importance.

Typical Applications

- ☐ Automatic Teller Machines to provide customers with anywhere, anytime access to their accounts
- ☐ On-line credit authorization to link banks to retailers for speedy authorization
- ☐ Imaging to provide fast access to customer information, faster document transfer
- ☐ LAN to LAN communications with the move to decentralized processing
- ☐ Telemarketing for collections
- ☐ On line financial information for stock updates etc.
- ☐ Wireless for technical support
- ☐ Teleconferencing, particularly on the investment side for daily updates

INSURANCE

Respondents in the insurance industry say that the most important success factors are

- price
- product
- service

Some regard telecommunications as less important to their product, and a small part of overhead; others are looking at innovative ways to use the technology to compete effectively with larger firms on a national basis. (For example, through implementing work at home programs, or providing on-line access to their databases for large customers.)

Typical Applications

- ☐ Remote access to databases for agents
- ☐ E-mail with agents
- ☐ 1-800 service for agents and clients

RETAIL INDUSTRY

In the current economic environment, the following are seen as key in the retail sector:

- cost control
- effective inventory management
- customer service
- merchandising

Many retailers use telecommunications for inventory control -- for example, using within-warehouse communications to verify quantities, locations, and item movement, and using sales data to update the information on store requirements.

For retailers involved in phone order sales, delivery speed is mentioned as a key factor in customer satisfaction. Telecommunications enhances delivery speed; for example, customers can place orders over the phone, and shipping information is transmitted immediately for prompt delivery.

Many retailers rely on telecommunications for receiving a significant part of their orders and inquiries. This is particularly true of catalog sales operations and retailers who promote products by mail or television.

Typical Applications

- ☐ Electronic Data Interchange to exchange trading information with suppliers
- ☐ Point of Sale Terminals/ Inventory Control/Credit to link local stores to central inventory and financial information
- ☐ Incoming Call Management to handle customer inquiries and orders

RESOURCES

Respondents mentioned the following as competitive factors in this segment:

- technology
- cost control
- productive efficiency

Making sure no calls are missed is just as important in this sector as in the retail sector, even though the volume of calls may be less.

> *"We could have $20 Million on one invoice. Missing one of those calls could wipe out all our profit for a year."*

Telecommunications also contributes to productive efficiency, reducing the cost per unit of the resource product.

Typical Applications

- ☐ Process management
- ☐ Wireless communications for sales
- ☐ Electronic Funds transfer and point of sale

PUBLISHING

In publishing, key success factors mentioned include:

- customer service
- quality journalism
- advertising/marketing

Telecommunications is regarded as an essential part of the production and delivery of the product. Writers frequently gather information by phone or through data searches, and often transmit articles and other material to the editorial office by modem. Design of magazines or other publications is largely electronic, and high-quality images of the finished product may be transmitted to the printer for production. Advertising copy and images may also be received electronically and incorporated in the publication, speeding up the production process.

Typical Applications

- ☐ Voice processing to handle advertising and incoming calls
- ☐ High speed data transmission to publish remotely
- ☐ FAX for special services
- ☐ Telemarketing for sales and collections

TRANSPORTATION

In the transportation sector, key success factors include:

- costs
- service
- scheduling
- response time

Telecommunications is essential in the provision of service, in particular in tracking the location of shipments or vehicles and in scheduling. Companies with automated central tracking systems can answer customer inquiries on the spot, which gives them an advantage over competitors with manual tracking systems. Constant information about vehicle location also enhances the company's profitability, by reducing the times when vehicles are empty.

Typical Applications

☐ Real Time Tracking

PROFESSIONAL SERVICES

Depending on the specific nature of the business, professional services emphasize different success factors, but they include:

- price
- customer service
- technology
- marketing
- excellence in people

Telecommunications affects both price and customer service, by reducing the amount of time it takes to respond effectively to client needs.

Smaller professional service firms interviewed emphasized the importance of the quality of their people. Larger firms discussed the importance of using technology to link their staff teams and make them more productive.

Typical Applications

- ☐ E-mail and file sharing among professionals
- ☐ Modem links over dial-up lines from client site into in-house database
- ☐ Searching remote databases (precedents, title searches)
- ☐ Wide area networks linking professional teams located remotely from each other into a single work team

HOSPITALITY

In the hospitality industry, success factors mentioned include:

- customer service
- product
- marketing
- general economic factors

Telecommunications is key to providing good customer service in the hospitality sector (for example hotels, tourist bureaus, and restaurants). Initial contacts and orders often come in by telephone or fax. Multi-location hospitality chains maintaining centralized databases can enhance their attention to individual customers – for example, through "frequent guest" programs – and thus gain an advantage over less telecommunications-intensive competitors.

Typical Applications

- ☐ Incoming call centres to take orders and reservations
- ☐ Data or fax links from call centre to inform service locations if bookings
- ☐ Central databases to record guest preferences

b) Size Differences

Only medium and small firms specifically mentioned excellence in people as key competitive issues, though this may be an artifact of the interview process. (There is no apparent reason why this factor would not also contribute to success in larger firms.) Telecommunications was described by many respondents as a key facilitator for increasing staff effectiveness in working with each other, and with customers.

Small firms mentioned that technology can give them access to resources (and thus an ability to operate on a larger scale) than was the case in the past. Facsimile services, in particular, were mentioned as beneficial in allowing small companies to deal with remote customers. Several small retailers said that telecommunications has allowed them to serve larger areas and compete with larger companies in their segment.

Competitive success factors mentioned did not vary significantly by size of company within each sector. Smaller firms in each sector appear to face similar competitive challenges to those which the larger firms face.

c) Comparison to US

In general the competitive issues mentioned by US firms in each segment are similar to those mentioned by Canadian firms. Although US respondents placed slightly less emphasis on cost control as a competitive issue than Canadian respondents, this is still an important factor for them.

In some sectors, additional points were raised by US respondents. For example, one US bank emphasized location as being the most important issue, and appeared to view the bank as a more concrete community centre than an electronic service.

Some US retailers placed more importance on the impact which telecommunications has on their business than some of their Canadian counterparts.

> *"Telecommunications is critical to get the customer the right merchandise at the right time, whether it is in the store or in their home."*

Several US respondents specifically mentioned telecommunications as a major success factor in the context of providing customer service. (This was also true of Canadian respondents, however.)

D. COMMUNICATIONS HIGHWAY

Telecommunications plays an important role in allowing companies to exchange information with customers and suppliers, as well as to communicate effectively within the company.

1. Communication with Customers

Virtually all companies interviewed, across all sizes and all industry sectors, use telecommunications to communicate with their customers.

Incoming calls are critical in most companies for receiving orders or inquiries. In some industries any given call may become a sale, often a big sale. Many companies have implemented 800 services and voice response technologies to ensure that it is easy for customers to place orders.

Customers also call in for service. Some industry segments are more dependent on good customer service than others. For example, in the computer industry, service and technical support are particularly important.

Even in industries like pulp and paper or manufacturing, telecommunications is important to allow customers to track the status of an order. In some segments, telecommunications is used for remote monitoring of products placed on the customer premise and to provide diagnostics.

a) Sectoral Differences

The large manufacturers interviewed make less use of outbound telemarketing than companies in the retail and financial segments. Outbound telemarketing is used in retail, banking, publishing, hospitality and some transportation companies (for example airlines). Inbound call centres are also important in these industries for links to the customers.

Resources industries with limited retail operations are less dependent on telecommunications for communicating with customers, than are those with retail outlets.

In manufacturing, there appears to be a connection between telecommunications intensity and the size of the customer base in manufacturing. Companies with large numbers of customers, for example in the consumer market, are more dependent on telecommunications than for example the steel industry where there are typically a smaller number of customers (with relatively larger orders).

b) Size Differences

Size of company does not appear to affect the degree to which telecommunications is used to communicate with customers, as much as sectoral differences and

functions do. For example, companies operating incoming call centres – whether small, medium, or large – made very similar comments regarding their applications. Similarly, companies across the size spectrum are involved in telemarketing.

Retailers – whether large or small – need on-line credit verification. An increasing number of retailers are using both inbound *and* outbound telemarketing.

c) Comparison to US

Although the applications of technology for communication with customers are similar in both countries, it does appear that American companies have been more aggressive in implementing telemarketing systems and on-line ordering systems. In addition, more US companies mentioned using *teleconferencing* for communication with customers (in two cases for sales training) than did Canadian companies. In addition, there were more examples of providing consumers with on-line, PC based ordering and account inquiry services than in Canada.

2. Communication with Suppliers

Telecommunications is also important as a means of communicating with suppliers.

For some industries, *inventory management* is strategic; therefore efficient communications with suppliers is particularly critical. While many companies place orders using voice communications, more are turning to facsimile. Several companies mentioned using "mainframe-to-fax": a mainframe computer program which generates a purchase order and faxes it to suppliers. This permits companies to generate orders electronically, even if their suppliers are not equipped to handle orders by EDI (Electronic Data Interchange). Many firms are investigating EDI for placing orders, particularly where inventory management is strategic, for example, in retail.

Companies involved in international trading report that the ability to transmit customs documents electronically is becoming increasingly important. Even in the insurance business, medical claims forms are being transmitted electronically. The airlines use EDI for cross billing with other airlines.

a) Sectoral Differences

The retail industry places emphasis on EDI for inventory management. As well, POS (Point of Sale) and on-line credit verification are critical to large retail chains.

In the oil industry, telecommunications is also used for process control and for monitoring exploration projects.

In professional services (for example, law firms) and publishing, telecommunications is used to provide access to on-line information sources for research. This type of information is a "supply" necessary to effective client services.

b) Size Differences

Small and medium companies make less use of EDI to communicate with their suppliers than large companies do. Smaller companies rely heavily on voice and fax for this function. (Larger companies use voice and fax for ordering and price gathering too, however.)

c) Comparison to US

More American companies appear to have implemented EDI, while Canadian companies in similar industries are still looking at it.

Some American publishers have high speed links to printers to allow camera-ready art to be transmitted, something which is less common with Canadian publishers, due to the relatively higher cost in Canada of the high-speed services needed for transmitting high resolution images.

3. Administering the Business

Many of the companies interviewed are multi-location firms and rely heavily on voice, data and even video links to keep head office, regional offices and branches tied together. A few mentioned that telecommuting – "work at home" arrangement – are either in place or under consideration as a means of reducing overhead costs and maintaining a more flexible work force.

Staff in most companies (whether the firm operates from a single location or multiple locations) make heavy use of voice and data to communicate with each other.

a) Sectoral Differences

Segments such as retail and finance typically have more offices and require a much higher level of geographic coverage than manufacturers or resource industries, which tend to be more concentrated in their locations.

However, manufacturers with large sales operations have a greater requirement for telecommunications for internal communication. In retail and banking, internal communications is critical.

In some industries such as hospitality, communications between the head office and the branches is very important, but there is less need for branch-to-branch communication. In contrast, some industry segments such as professional services have extensive need to communicate between branches.

Some companies are using telecommunications to link field and sales staff from customer locations or from their homes. Some use telecommunications to support

collaborative design between groups in separate locations.

b) Size Differences

Size appeared to be less of an issue than the degree to which operations are decentralized with offices across the country, and the specific nature of the business.

Smaller companies appear to have more limited data processing requirements and therefore less need to link offices with high speed data lines. Fewer small companies mention using videoconferencing.

Virtually every large company interviewed uses either e-mail or voice mail, and some use both extensively. Smaller companies use these technologies as well, though they are less pervasive; internal voice calls and fax are more frequently used.

c) Comparison to US

Some Canadian subsidiaries of American companies have the luxury of allowing their American counterparts to take care of portions of their internal communications, for example for transaction processing.

Some companies in both countries have developed national voice networks with uniform dialing plans, while others haven't. Companies which are subsidiaries of US companies or which have branches in other countries also rely heavily on telecommunications.

Some companies are doing more with telecommunications for internal communications than their Canadian counterparts. For example, American insurance companies appear to have more on-line services for agents than Canadian firms. As well, US firms report more extensive use of both audio and video teleconferencing.

The reasons for these differences are largely related to the relative cost and availability of services in Canada and the US, discussed in later sections.

E. TELECOMMUNICATIONS AS PART OF THE PRODUCT

1. Overview

Effective use of telecommunications to transport information is very important for most companies – and may be strategic in its impact on the company's competitive position. However, in many firms telecommunications is more than a transport medium: it forms part of the product or service delivered.

A number of examples were summarized earlier in the section describing "Key Applications". For example:

- A retail sales chain constantly tracks sales levels by store and by item, checks prices against competitors' prices, and transmits price changes to stores. This information, along with market information and regular reports, is part of the service it delivers to its franchisees.
- Reservation centres contract with hotels to centrally receive and process bookings and inquiries. These may be independent centres, or may be operated by the hotel chain as part of the service provided to each of its hotels.
- Airline reservation centres connect travel agents all over the country directly to centralized databases of available flights, and process ticket orders.
- Incoming call centres – operated by retail companies or telemarketing bureaus – receive and process orders over the phone. The service often includes on-line authorization of credit card payments, and transmittal of shipping information.
- Answering services answer calls for clients who are away from the office or for some reason are unavailable for calls. (Doctors' offices are a typical example of such a client.) The service may include message notification by cellular phone, pager or fax.
- Publishers assemble magazines, newsletters and books electronically, in many cases receiving material transmitted to them by writers and advertisers. The finished product is transmitted to printers – often geographically remote – to deliver the product simultaneously to customers in many cities.
- Manufacturing development teams are often geographically dispersed. They use image, voice and data communications to quickly share information and develop the product.
- Lawyers can research case law and conduct title searches electronically, allowing them to serve clients more quickly and within a wider geographical area. Documents can be transmitted by high-resolution fax to increase the speed by which transactions can be completed.

- Phone numbers may become part of a company's corporate identity. (Number portability becomes an issue for such firms; they cannot afford to lose their identifying number, so they may be restricted in their choice of carrier or geographical location.)
- Insurance companies and other firms can draw on a more diverse work force by using technology to allow them to work from home or from remote offices, using terminals connecting them directly to corporate databases.
- Training services may be delivered by videoconferencing, or by audioconferencing augmented by fax or still image transmission.

2. Comparisons by Segment

a) Sectoral Differences

Some respondents from manufacturing firms say that telecommunications is not part of their product, others say that it is. (Often this is a matter of perception, particularly of the degree to which customer service is viewed as inherent in what the company delivers to customers.) In companies where design is critical, telecommunications is often a key part of the development process. Several large manufacturers mentioned interactive design as a critical part of the product development process and one that is dependent on telecommunications.

In finance, telecommunications is integral to virtually all of the services delivered to customers. Automatic teller machines have become so ubiquitous that telecommunications is now an essential component of banking services. In the commercial sector, electronic fund transfer is also an essential service.

Some Canadian insurance firms consider telecommunications simply part of their overhead costs. Others are putting resources into using telecommunications to improve service to customers and agents. Increasingly, telecommunications links to agents are facilitating the process of drafting and pricing policies.

Most Canadian retailers consider telecommunications to be critical to the purchase process. Point of sale terminals (connecting the "cash register" directly to the store's computer) are increasingly essential in this industry. These are also important in the hospitality industry: for example, hotel restaurants use them to charge guest's meals directly to their room.

One retailer stated strongly that telecommunications allows them to provide timely services to franchisees, and thus gain a competitive edge on other franchise retailers. Inventory management – ordering the right products at the lowest cost on time and in the right quantities – is essential and relies heavily on telecommunications.

In resource industries – for example, mining and oil – telecommunications does not appear to be considered part of the product, though it does affect operating

costs and is thus an important competitive issue.

In publishing, telecommunications is considered a very important part of the product, as much of the production of newspapers is on-line. Although Canadian magazines are less involved in on-line publishing than their American counterparts, telecommunications is used as an important component of the information collection process. Newspapers are often published electronically in several places, making timely national distribution possible.

In the airline industry and some segments of the hospitality industry, a call is a sale. A missed call is a lost sale.

In the professional services segment, telecommunications can often be viewed as part of the product, depending on the specific service being provided. A number of small companies in this segment provide services, such as telemarketing or research, to which telecommunications is integral. Typically, consultants and professional firms also use telecommunications heavily in providing consultation to customers; therefore many consider it part of the product.

b) Size Differences

The importance of telecommunications in creation or delivery of products and services depends more on the specific industry than on size.

There are many small companies, particularly in the professional services area, where products are built around telecommunications, for example in telemarketing.

Small and medium companies may not have the resources to invest in advanced technologies which large companies have. However, there are numerous cases of innovative applications – often championed by an entrepreneurial group or individual within the firm – which small companies may implement more quickly than larger, less flexible companies. The key is having someone who understands the technology options and can apply them to the business: many small firms do not have anyone on staff with these abilities, and thus miss opportunities which could open up new markets for them or increase the range of services they could offer to existing customers.

c) Comparison to US

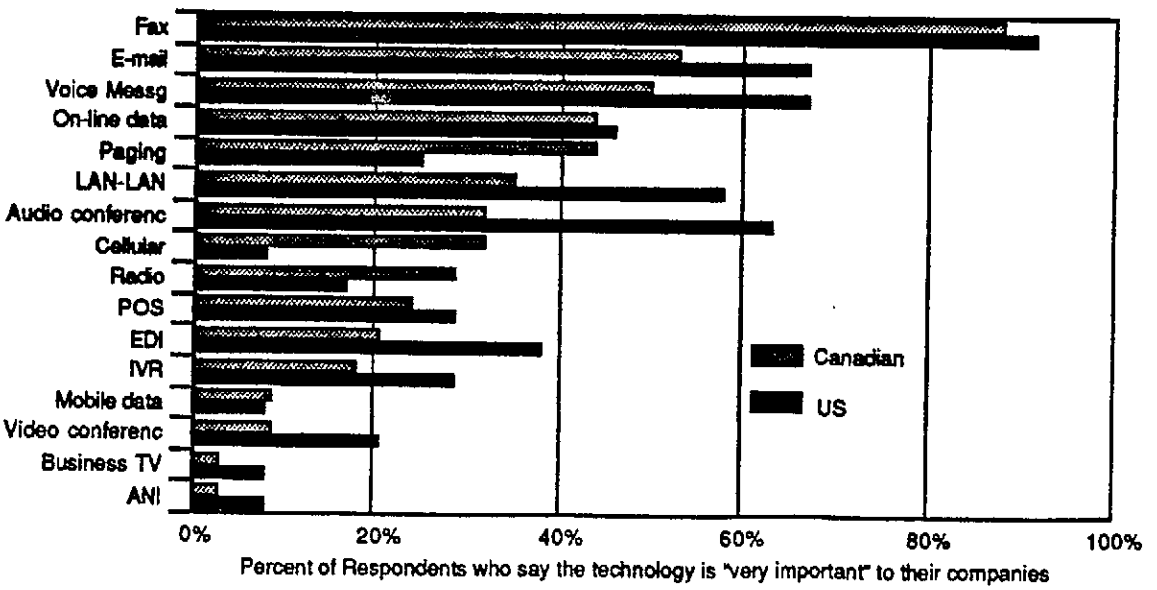
Use of telecommunications to create or enhance products and services is similar across industry sectors in both countries. There appears to be more variation within industries than between countries in the degree to which telecommunications is used to enhance products and services.

F. SERVICES USED

1. Technologies Used

Technologies used, in order of average ranking of importance by Canadian respondents:

Technology in order by % of Canadian firms reporting as "very important"	Canadian Sample		US Sample	
	Rank Order	%	%	Rank Order
Facsimile (FAX)	1	88%	92%	1
Electronic Mail	2	53%	67%	2
Voice Messaging	3	50%	67%	2
On-line data applications	4	44%	46%	6
Paging	4	44%	25%	10
LAN-LAN communications	6	35%	58%	5
Audio teleconferencing	7	32%	63%	4
Cellular	7	32%	8%	13
Wireless communication (other than cellular or paging: mainly radio)	9	29%	17%	12
Point of Sale terminals (POS)	10	24%	29%	8
Electronic Data Interchange (EDI)	11	21%	38%	7
Integrated Voice Response (IVR)	12	18%	29%	9
Mobile data	13	9%	8%	13
Video teleconferencing	14	9%	21%	11
Business TV (one-way)	15	3%	8%	13
Automatic Number Identification (ANI)	16	3%	8%	13



These comparative rankings should not be over-interpreted, particularly the differences between countries: the samples are too small for conclusive comparisons.

Nevertheless, some points are worth noting:

- *Facsimile*, *electronic mail* and *voice messaging* are clearly the top three of these technologies used.
- *Paging* was ranked as "very important" by a surprisingly high number of Canadian respondents. In most cases, the technology is used for a limited but important application – for example, to alert technicians immediately when there is a computer or telecommunications problem.
- *Audioconferencing* is more widely used than *videoconferencing* by respondents in both countries. (Relative cost is usually the deciding factor.)
- Teleconferencing – both audio and video – was judged important by a higher percentage of US respondents than Canadian respondents.
- Similarly, more US than Canadian respondents said that *LAN-LAN communication* is important. This may reflect the lower cost of T-1 services in the US, and the availability of Virtual Private Networks, both of which facilitate the establishment of connections between local area networks.
- More Canadian than US companies consider *cellular* technology important to their business – often to support mobile senior executives or sales teams. This result reflects the overall greater penetration of cellular in Canada, which has been reported in numerous studies.

An interesting example of wireless telecommunications is a US retailer who is implementing wireless sales registers, so that they can be readily relocated on the floor to accommodate sales displays without expensive recabling.

a) Sectoral Differences

There are clear sectoral differences: the technologies used are clearly tied to competitive issues within the segments.

In segments where customers service is identified as a key factor (for instance in retail, finance and professional services) there is a higher use of voice messaging and telemarketing.

In segments where inventory management is critical, such as manufacturing, there is more use of EDI.

b) Size Differences

Facsimile and voice messaging are important to most companies regardless of size. Interactive voice response is used by large, medium and small firms and appears to be linked more closely to industry sector than to size.

Data applications, including electronic mail, LAN to LAN communications and EDI, are reported as important by more large organizations than small ones.

Many small and medium firms use audioconferencing, but videoconferencing was reported only by the large firms interviewed. This reflects the greater complexity of administering decentralized operations in larger companies, and thus the greater likelihood that they can cost-justify the higher cost of videoconferencing.

c) **Canada vs. the US**

Although the data should be interpreted cautiously, there are several technologies such as teleconferencing which appear to be more widely used in the United States. Electronic Data Interchange also appears to be more extensively used, although many Canadian firms indicate that they intend to use it or are running pilot projects.

The one area where Canada appears to be ahead is in terms of cellular communication: more Canadian firms consider this to be "very important" to the way they do business.

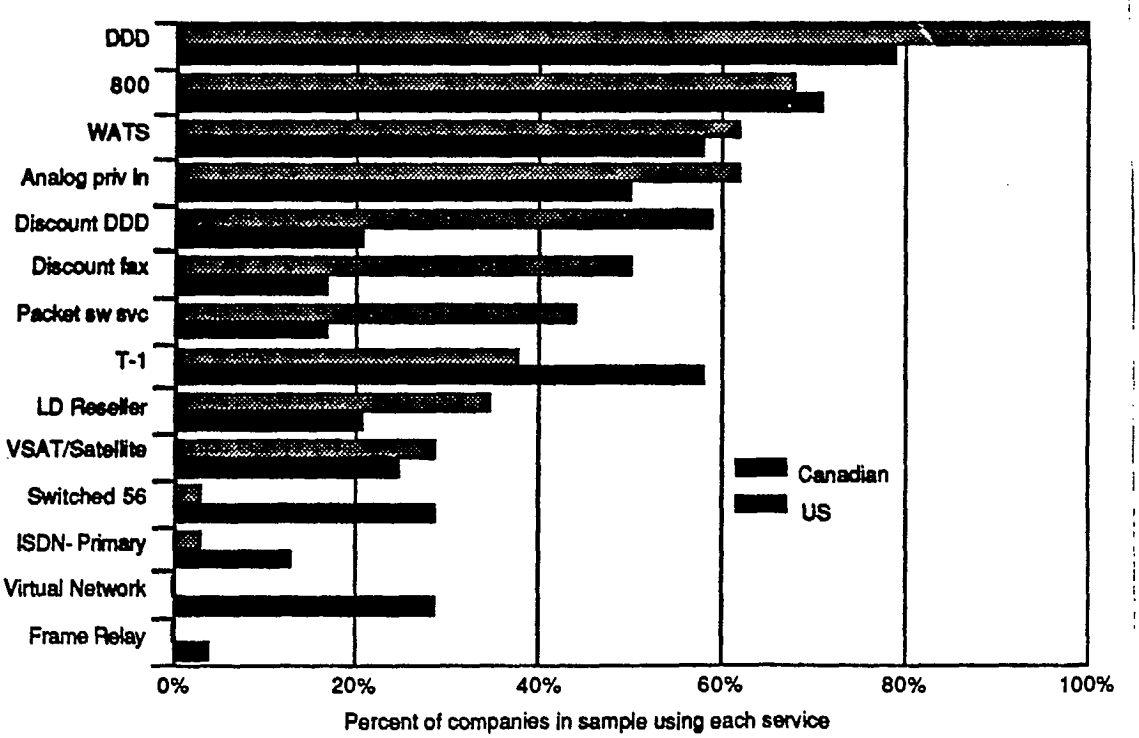
Another apparent trend was that Canadian subsidiaries of American companies tend to implement technologies such as teleconferencing ahead of their Canadian counterparts. (Although this varies even within sector: some Canadian companies are using teleconferencing heavily, even though other Canadian firms in the same industry may not be.)

Few US companies in our sample reported using Automatic Number Identification, which delivers the number of the calling party along with the call. The exceptions tended to be telemarketing service bureaus, who use the number of the calling party to access database information to speed up or customize call handling. This feature is not yet available in Canada on a network-wide basis in the public network (it is part of the Megalink and Microlink ISDN filings before the CRTC.) However, companies with private networks can use a similar feature on their internal networks, and identification of *local* calling numbers is a feature available in a number of Canadian cities.

2. Network Services Used

The Network Services used by respondents are listed below, in rank order by the number of Canadian companies using them:

Network Service in order by % of Canadian firms using the service	Canadian Sample		US Sample	
	Rank Order	%	%	Rank Order
DDD (Regular long distance)	1	100%	79%	1
800	2	68%	71%	2
WATS	3	62%	58%	3
Analog private line (FX, OPX, low speed data)	3	62%	50%	5
Discounted DDD (e.g. Advantage)	5	59%	21%	9
Discounted fax (FacsRoute, Faxcom)	6	50%	17%	11
Packet switched service	7	44%	17%	11
T-1	8	38%	58%	4
Long Distance Reseller	9	35%	21%	10
VSAT/satellite	10	29%	25%	8
Switched 56 (or higher)	11	3%	29%	6
ISDN-Primary Rate	11	3%	13%	13
Virtual Private Networks	-	-	29%	7
Frame Relay	-	-	4%	14



Interpretation of these results is complicated by the fact that US services cannot be directly mapped onto Canadian services.

For example, *WATS* (wide area telephone service) in the US is a general term embracing a wide range of discounts for outbound calling, varying from simple discount similar to Advantage service in Canada, to high-volume discounts available over T-1 accesses and often combined with multiple-location and multiple-service discounts. Some US companies have contracted for individual terms under special agreements with the carriers.

So asking a US respondent "do you use DDD, WATS, or a discounted DDD service" proved to be a very imprecise question.

It is clear, however, that *voice services* are important to all companies. Some combination of DDD, discounted DDD, and WATS for outbound calling are used by virtually all respondents.

800 service for inbound calling was the second most-frequently-reported network service in both countries.

Comparison of the data services used is also interesting. Because T-1 is less expensive in the US (some studies have concluded that Canadian T-1 rates are as much as 2.1 to 4.1 times as high as US rates – see Appendix 5), more US companies use T-1 for their data networking. Canadian companies tend to substitute analog private lines and dial-up data services (including packet switched services such as Datapac) in applications where their US counterparts use T-1. This does not necessarily reflect a preference for such services in Canada. In most cases, it is the contrary: the company has simply decided it cannot afford the high-speed link and uses the next most-affordable alternative.

A number of Canadian companies say that *local service* plays a significant role in their business. For example, answering services, taxi companies, and courier companies rely heavily on being reachable within the local telephone service area.

Switched 56 Kbps service and *Virtual Private Network* services are much more widely reported in the US. This reflects differences in cost and availability:

- Switched 56 service is available in Canada, but not in all locations, and the cost remains higher than in the US.
- Virtual Private Network service – increasingly used in the US to replace dedicated T-1 networks, especially for voice service but also for data applications – is not available yet in the Canadian public network, though Stentor has announced a market trial this spring. Unitel offers VPN service to its private network customers. (Public VPNs provide the flexibility of a switched service, along with the high speed and customer control otherwise only available with a dedicated network at T-1 or higher capacity.)

a) **Sectoral Differences**

Sectors such as banking with highly decentralized operations and high communications requirements make more use – in both countries – of T-1 and fractional T-1 networks than industries with less decentralization and lower requirements for high-speed transmission.

The service ratings also reflect a heavy dependence on voice communications in most industry segments.

b) **Size Differences**

Clearly, large companies are more likely to need – and to be able to afford – private networks. Very few medium and no small companies in Canada reported using T-1 or fractional T-1 links, though several US firms in these size groups do use T-1 and sub-T-1 leased lines.

Though Switched 56 service is available as a Small Centrex data service in Canada, none of the small or medium companies interviewed reported using it. Few small and medium companies interviewed are currently using long distance resellers, even though these size segments are the target markets for many resellers. In contrast, most of the large companies interviewed are using one or more reseller services, though most reported using the service in limited applications or on a trial basis.

c) **Comparison to the US**

Many US companies appear to use T-1 and Virtual Private Networks to accomplish the calling for which Canadians currently use WATS and 800 service for voice, and low-speed analog lines or dial-up services for data. A number of US respondents are using AT&T's Megacom service, which gives them multi-location and multi-service discounts on all outbound and inbound calling. Several of the US users use T-1 mainly for high-speed access to the carrier network, rather than for private leased networks. (This reflects the difference in the US industry structure, with local carriers separate from long distance carriers. In this case, the customer is using the T-1 access to bypass the local carrier.)

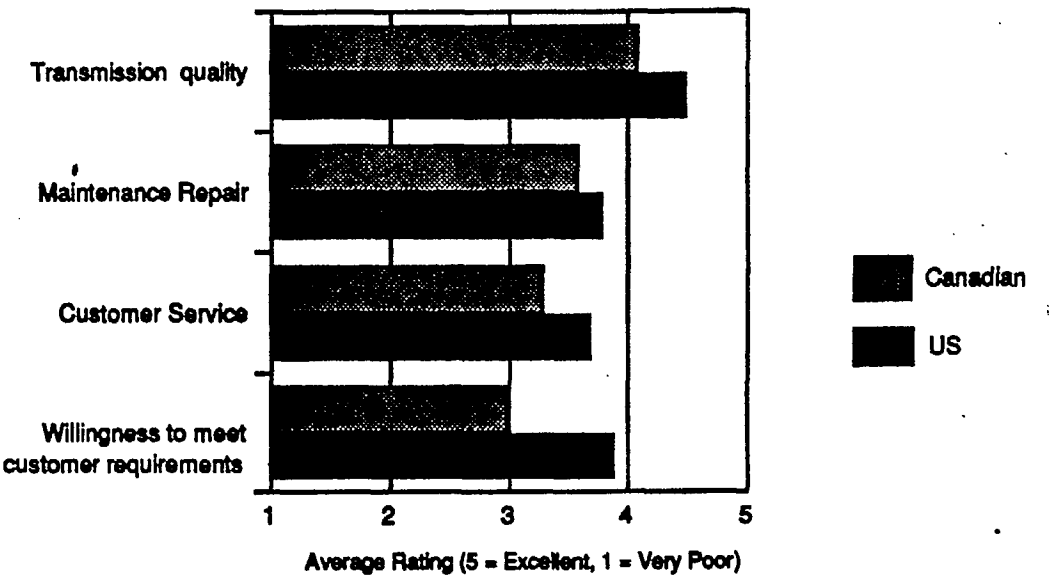
Fewer Canadian companies have private networks, and there appears to be less use in Canada of high speed lines for data transmission and videoconferencing.

The US sample reported more extensive use of virtual private networks. Switched 56 service is also more common in the US, used in particular for backup service (e disaster recovery) and videoconferencing. Frame relay is just appearing in the US, but a small number of firms are using it. (One company reported "tearing out" its T-1 network and replacing it with frame relay over VPN, with backup provided by Switched 56 Kbps service.)

3. Ratings of Current Services

Service Component:	Canadian Sample	US Sample
	Average rating	
Transmission quality	4.1	4.5
Maintenance/repair	3.6	4.1
Overall customer service	3.3	3.8
Vendor's willingness to meet customer requirements	3.0	4.0

Rating: 5 = Excellent; 4 = Very Good; 3 = Good; 2 = Poor; 1 = Very Poor



It appears that companies in both countries are very satisfied with the quality of their transmission services. The difference between the Canadian and US sample on this item should not be over-interpreted – a larger sample would likely bring the two ratings into line. It is safe to conclude, however, that US companies are no less happy with their transmission quality than Canadian companies.

The most notable of the ratings, however, is in the area of *customer service* and *vendor's willingness to meet customer requirements.*

The low rating Canadian companies gave their carriers on these two items was certainly borne out by customers' critical comments. These ratings applied to the various telephone companies across Canada, and to Unitel as well in cases where customers are using Unitel services. This point will be discussed more fully in the section on "customer concerns".

A small number of customers stated that they are getting good customer support from their carriers – that their representative always keeps them up to date and is willing to find ways to accommodate their specific needs. (This tended to reflect the particular individual acting as their representative, however; other customers of the same carrier gave them poor support ratings.)

a) **Sectoral Differences**

Users in very telecom-intensive industries, such as finance, seemed to have higher expectations and so were somewhat more critical than users in less telecom-intensive industries. Professional services companies also generally had high expectations.

b) **Size Differences**

Large firms, with more sophisticated requirements, tended to be more critical than smaller firms – with the exception of small firms who make heavy use of telecommunications such as telemarketing firms.

c) **Comparison to US**

Notwithstanding the limits of the sample, it appears that while some American respondents complained bitterly about their carriers – including their local carriers – overall, they are more satisfied with the flexibility of their carriers in meeting their requirements.

4. Network Topologies

While it is difficult to draw conclusions about network topologies from this study, there are a number of issues to consider.

In many cases, the nature of the company's topology is dictated by cost and availability of services, rather than by the "ideal case". A number of Canadian respondents, for example, say that they would like to be able to have dedicated on-line connections between all of their locations, but can only cost-justify low-speed dial-up communication.

> *"We put in Datapac for our general agents: that decision was made by cost. We would have preferred a private network at the time, but the cost was too high. We outgrew the Datapac service as soon as we got on it. It wasn't the best service for what we wanted to do. We put in lower speed service to keep our costs down, but it meant we couldn't really do what we wanted to."*

In some cases Canadian companies want to centralize because of operational efficiencies. In other cases, companies want to decentralize information processing in order to implement client/server applications and to provide more flexibility for end users. It may be that the move for large transaction processing applications,

whether voice or data, is best centralized whereas end user applications are decentralized.

Many of the Canadian networks are regionalized, with offices feeding into regional hubs and then to the head office. Several respondents said that this is not through choice but because of the prohibitive costs of moving to a centralized network. T-1 and fractional T-1 often form the backbone of larger networks, but these "backbones" are in some cases limited to a link between two or three cities.

Some companies are moving to distributed processing via local area networks, but typically still need mainframe access.

a) **Sectoral Differences**

Companies with large data processing requirements (eg. insurance and finance firms) reported using regional data centres, and appear to be more data communications intensive than the manufacturing sector.

The trend in the retail industry appears to be toward centralized topologies, because of the necessity of consolidating information.

In some instances mergers and acquisitions have created anomalies and hybrid topologies.

Typical, for example in the hospitality industry and in the airline industry, were star networks connected to mainframes with dial-up or satellite links.

Some companies report linking PBX and ACD systems together for networked applications such as centralized reservation systems and nation-wide voice messaging.

b) **Size Differences**

Small companies report less use of private networks; they rely more heavily on switched services and packet switching. However, even some large companies in Canada reported that they are using dial-up data services and packet switching, though they would much prefer to use dedicated T-1 facilities: the issue for them, as for the smaller companies, is cost.

There was some evidence of a trend to decentralization: recognizing the importance of access to information on a local level, several large transaction intensive companies – including banks and retailers – have moved in recent years to implement LANs and network them together.

Many companies, particularly medium and small companies, still handle voice and data separately. For instance in some cases, T-1 is used to link voice switches together but not for data communications – or vice versa. There are still a relatively large number of companies using analog facilities for data in Canada but many are

moving to digital links. Several indicated that they would prefer to use high speed facilities but cannot cost-justify it.

Fewer small and medium companies have dedicated links between locations, even when they operate in multiple locations.

c) Comparison to US

More US companies, particularly large companies, report use of large complex private networks. In addition, one American respondent has completely outsourced their data processing and network operations, which is less common in Canada (and was not reported by any of the Canadian respondents.)

On the other hand, many US companies in the past five years have replaced some or all of their dedicated T-1 networks with Virtual Private Network services. Some retain a T-1 (or higher bandwidth) backbone network and use VPN to connect to it. Some use VPN for voice and T-1 or T-3 for data, though increasingly companies are using VPN for data as well.

Few of the companies interviewed in either Canada or the US report using ISDN. (In Canada, commercial ISDN services await tariff approval. In the US, services are fairly widely available from the interexchange carriers, but cost and availability of local access is variable.)

Small companies in the US, as in Canada, are much less likely to have private line services or to use high-speed transmission. None of the small or medium US firms interviewed, for example, reported using VPN or Switched 56 service, though several use analog leased lines.

G. RESPONDENTS' CONCERNS

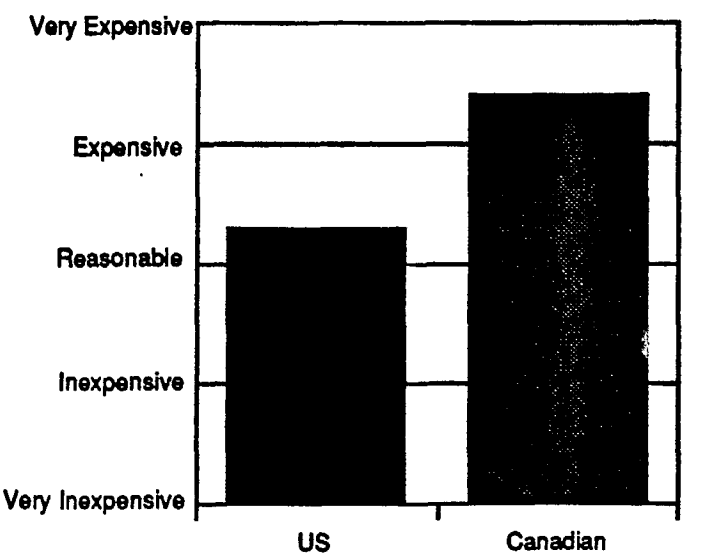
Canadian businesses have a number of concerns about telecommunications costs and services. There was a great deal of discussion about the need for lower prices, for a wider selection of services, and for better customer service from the carrier representatives.

It was fairly clear that many Canadian companies are aware of services, billing options and pricing available in the US. Many US respondents were unfamiliar with Canadian costs and services, although most had a vague sense that prices are higher in Canada.

While US companies appear to want for less, and more of them rate their costs as "reasonable", they did indicate that services are not universally available south of the border. Respondents in remoter areas in the US complained of a lack of services. Many want access to the same things as their Canadian counterparts.

1. Cost of Services

Rating of Cost of services	Canadian Sample	US Sample
Very expensive	52%	4%
Expensive	36%	25%
Reasonable	12%	63%
Inexpensive	-	8%
Very inexpensive	-	-



Average Rating of Cost of Current Services

Most Canadian respondents said telecommunication service in Canada is expensive.

Many Canadian respondents expressed the view that Canadian telecommunications costs are still 2 to 5 times higher than US costs, particularly for high speed datalinks such as T-1 and fractional T-1. (These perceptions are supported by the available research: see Appendix 5 for a summary of available studies.)

On a per minute basis, several respondents mentioned that their American counterparts are paying as little as 1/7 of the Canadian rate, because of the lower cost of private networks in the US.

When respondents are compared by company size, it is clear that dedicated private networks are feasible in the US for companies who cannot justify them for similar-scaled operations in Canada.

> *"Our sister company in the US puts in leased lines without the blink of an eyelash — and if we had their rates we could too. But we find our Canadian operations can't justify T-1 except on a couple of routes, and then only because our parent company shares the circuits too. Mostly we use dial-up data services for the same functions that our US sister company can do on-line over dedicated links."*
>
> *"Our parent company in the US is paying 7 cents a minute on its internal network, charging 9 cents a minute to external users on the network. In Canada, we are paying 42 cents a minute on average. They get a T-1 to go across a city, it costs $500. We would pay thousands. That's the biggest thing: the cost of service is so much higher here."*

One Canadian respondent said that the cost of local voice service is reasonable, though several complained that they could see no reason why rates for business lines should be higher than residential lines. Otherwise, local service costs were not specifically discussed.

> *"I'm disgruntled at the difference between business and residential rates. They don't give us any volume buying breaks — in fact in Edmonton, the more trunks we order, the more expensive each one of them gets."*

The most common view expressed was that, though Canadian costs have fallen enough to put some services within reach, they are still too high. For example, one respondent complained that the initial DS0 minimum for Megastream is too high. Some identified specific services such as fractional T-1 that they would use more extensively if they were cheaper. Others said that they would use additional services — or more of their current services — if they were less expensive.

- Some indicated that they would more aggressively explore new applications such as telemarketing if 800 and 900 services were less costly (and if more optional features were available on both services.)
- Several mentioned that they would significantly expand existing telemarketing operations if 800 costs were lower.
- Another said they would like to establish better links to their sales agents

and provide better services, but that the high cost of bandwidth is a bottleneck.

- Several said they would use more cellular service if it was less expensive.
- Another said "We would develop more client/server applications" if data networking costs were lower.
- For voice intensive companies, the cost of networking PBXs and voice messaging systems is considered a constraint even though the technology exists. (Currently this requires dedicated networks, though Virtual Private Network service could perform the same function if available.)

a) Sectoral Differences

Understandably, segments which are more telecommunications-intensive appear to have a larger shopping list than those which are not. They also appear to have a clearer idea of the products and services that they would use if they were available.

- In retail and banking, applications requiring high bandwidth such as image transmission and home shopping are specific applications mentioned.
- In the insurance industry, better services to agents would be provided with cheaper telecommunication access.

One respondent in the retail industry claimed that

> *"you probably see about 10% of the possible applications in our industry because of limits to service availability and high costs."*

Respondents whose market is local tended to think that telecommunications costs are reasonable; respondents from companies with large regional or national markets expressed concern over the high cost of long distance service.

b) Size Differences

Companies in all size ranges complained about the cost of service. Larger companies expressed more concern about the cost of T-1 and high-bandwidth services. 800 service cost was a concern across company size, as is the cost of switched voice service.

c) Comparison to US

Fewer American firms complained about high costs of telecommunications – it appeared to be much less "top of mind" as an issue with American respondents as compared to the Canadian sample. Smaller US companies expressed more concern with costs than larger firms.

Some US respondents thought US services are expensive, although most were unable to compare them to Canadian rates.

One New York respondent claimed that they had discontinued switched 56 service because it was too expensive – $600 per month for two lines. (This cost included both local and interexchange components.)

There were also complaints about the costs of T-3 and ISDN services in the US. Regarding ISDN, a large company not currently using it said

> *"It's still pricey. There is a wide variation in ISDN pricing from state to state."*

One large respondent complained about the cost of local service in the US:

> *"They should recognize that business drives economic development in the area. They need to balance consumer and business interests but if they don't keep costs down, business will move out."*

In general there were more complaints from US respondents about the cost of local service. Some advocated competition in the local exchange to bring prices down. Two large American firms specifically mentioned that they benefit from special tariffing arrangements with their carrier based on their high volumes.

These concerns about the cost of service are justified. Networking prices in Canada are significantly higher than in the US (see Appendix 5 for a review of some comparative studies.) Though prices have fallen significantly in recent years, and various discount options have been introduced, the differential is still very significant and is a clear barrier to the full implementation of telecommunications as a facilitator for economic growth in Canada.

Section L presents Bell Canada's and Unitel's views on the basis for these cost differentials, and whether they can be eliminated in the near future. Both agree that, for switched services in particular, there is an economic basis for significant price reductions in Canadian telecommunications.

2. Availability of Services

Many Canadian respondents expressed concern at the fact that many services or features available in the US are not available in Canada. There is a general perception that Canada lags behind the US in terms of the introduction of services, even though the underlying network technology is perceived as leading edge.

This perception, too, is accurate. Comparisons of services conducted in 1990 and 1991 showed significant disparities in the services available in Canada compared to the US. (See Angus, August 1990, and Brown, February 1991, listed in the bibliography.) Some of these gaps have been filled in the meantime, but many have not.

There is some cynicism that this lag will ever be caught up:

> *"Bell says we'll catch up to US costs in five years. But by then the US will have other services, like frame relay. We want to not just catch up but stay ahead."*
>
> *"Canada has to be more aggressive, faster in introducing new services. For example, there is this ballyhoo about having Switched 56 now. But Sprint has Switched 384, Switched T-1 service — in Canada we may get Switched 384 by 1995. We have the network technology here but don't use it. We seem to have lost our initiative."*

There were also concerns expressed about lags in service introduction within Canada.

> *"I'd like to see new services and enhancements get to market faster. I'm continually reading about things available in the US — then several years later Bell Canada gets them — then even later our phone company gets them."*

Several respondents expressed the view that while there were serious gaps in Canadian services a couple of years ago, Canadian services are catching up to US services. The real difference, in their view, remains in terms of costs and accessibility. For example, some mentioned services which are available in Canada but not universally or, in their opinion, are priced too high.

Some of the services which respondents would like to have available include:

- Several small businesses said they want 800 service terminating on regular business lines. (This service was filed by Bell Canada and other telcos in 1991 as part of a restructure of 800 and WATS service, and was approved by the CRTC on March 19, 1992, after the interviews were completed.)
- More flexibility in 800 service features. Larger companies, for example, want the ability to allocate calls between call centres, and have more flexible control over call routing. (Many of the additional 800 features wanted were filed by Bell Canada in December 1991, and await approval.)
- Switched 56 Kbps service, in particular for back up to data networks, and for videoconferencing. (Switched 56 service is available in some locations, but not all.)
- Higher Speed Switched Services — Switched 384 and switched T-1 service.
- High speed dedicated services, T-3 or higher.
- ISDN — Basic Rate to support ANI for incoming call centres and for work-at-home applications.
- ISDN — Primary Rate for access to switched services and to link PBXs and ACDs in private networks.
- Frame Relay, Fast Packet for data networks

- Virtual Private Network services

A few respondents expressed a desire for services not yet commercially available anywhere, such as Personal Communication Services. They would like to have them available as an alternative — for example, PCS might be used instead of older wireless technologies, such as radio; possible applications include warehouse communications, communications between maintenance teams, etc.

Some additional services mentioned include:

- Clear Channel DS0 with no premium for special assembly
- National Resellers
- Flat Rated X.25
- Personal Communications Numbers
- Access to services such as DISA in small centres
- Terrestrial services rather than satellite to remote locations
- Cross-border satellite service
- Uniform 800 number access to/from the US.
- National 900 service with interactive capability (the caller can speak to a live operator) and cross-border 900 service.
- Implementation of network features, including local features which are not available everywhere: for example remote call forwarding, call forward on busy, call forward on no answer. (These would benefit customers of answering services, for example.)
- Implementation of customer calling features to more exchanges.
- Portability of phone numbers.

Virtually everyone agreed that these services would at least have an effect on profitability and could also support new products and services. If more bandwidth were available at a lower price, companies would use more videoconferencing, imaging and collaborative design technologies which require high bandwidth.

Regulatory delay was specifically highlighted by a number of Canadian respondents as a factor contributing to the slowness of new service introduction.

> *"We can't plan based on a promise that a service will be available on a certain date. What if it's not? And we have changed our business relying on that promise? We need to know that a service is available, and what it costs, in order to plan."*
>
> *"We've been waiting for CRTC approval on the new 800 rates for some time. We expected the new rates to be approved by December 1 of last year, and that was in our budget. But the approval didn't come through. [Approval was issued March 19.] So our costs have been exceeding budget for months, due to the CRTC holding up that decision."*

Some participants suggested that deregulation or partial deregulation would speed up service introduction. The Railway Act, under which the CRTC regulates tele-

communications, does not allow the CRTC to forbear from regulating any of the markets served by the carriers it regulates; the new Telecommunications Act (Bill C-62) would permit this.

a) Sectoral Differences

There are marked differences in the services companies want depending on the sector and nature of the business. Companies where customer services and telemarketing are important (retail, publishing and hospitality for example) are very concerned about access to voice services such as 800 service.

In contrast, segments with high levels of transaction processing such as banks are particularly concerned about high speed data transmission such as T-1 and fractional T-1.

b) Size Differences

Small companies in the sample are almost without exception voice intensive. The focus of their concerns is access to 800 services in new packages (more flexible and less expensive) and to lower-cost outbound services.

"Larger" does not necessarily mean "more sophisticated" (or more knowledgeable). Some smaller companies are particularly eager to get access to new services such as calling number identification.

c) Comparison to US

Many American companies say they want the same services that Canadians are waiting for, which suggests that despite impressions to the contrary, new services are not universally available in the US. Large companies are particularly concerned about inconsistencies in service deployment. Several services which some US respondents specifically mentioned as not available to them included:

- Cheaper and more accessible ISDN
- Cheaper and more accessible videoconferencing
- Calling number identification
- Rapid deployment of wireless technologies – PCN and mobile data
- Virtual Private Networks – still limited in availability
- Switched 56/112 – not completely released in the US
- Signalling System 7 – not fully deployed
- FDDI
- True bandwidth on demand/dial up capability
- Frame Relay

- Residential ISDN and wideband services
- Integrated Voice/Data/Image Services
- International VPN and Frame Relay

3. Flexibility of Services

Respondents said they would like more flexibility in provision of current services.

"Our only flexibility now is cancelling a service. Ordering it in, ordering it out."

In particular, flexibility in billing formats, and additional flexibility in 800 service, were frequently mentioned.

Billing

Many respondents indicated that the current billing structure complicates their administration. Many drew comparisons to American service providers and resellers in highlighting the phone companies' weaknesses in this area. Most respondents believe these options are available in the US.

They expressed a need in particular for:

- **Consolidated billing with options.** Large companies in particular want national billing and regional billing options for all services. Even medium-sized companies operating in a single province said "We get too many phone bills." Some suggested a need for exception reporting options on bills. They also expressed difficulties in dealing with more than one phone company because of lack of consistency in services, pricing and billing.

  "I want to get one Megastream bill instead of three".

  "Right now I get 40 separate telephone bills — I would like them consolidated. Within these bills, I would like some items broken out which aren't now."

- **More usefully-organized information on bills.** Many said that the bills provided by the telcos are difficult to understand and that clearer definitions are required.

  "Right now my phone bill is 130 pages long. We need a better understanding of what we're paying for...In one of our towns, I get 6 phone bills. And they don't come in on the same date. So figuring out what our costs are, and comparing them to what we thought they should be, is nearly impossible. Accounting is spending too much time on this as it is. In all of our other purchasing, we carefully compare our bills to what we ordered. We can't do that with telephone service. Our approach is 'how is the bill different from last month?' If we can account for the difference, we pay the bill. To go any further would just cost us too much time. It's very frustrating."

- **Machine-readable bills.** Several expressed a need for billing information to be provided on-line or in machine readable form.

- **Ability to allocate calls by accounts.** Many organizations allocate bills internally to clients, projects, or departments. The ability to sort bills by customer-defined account codes would benefit many. (This is one of the services offered by many of the resellers, and is an area where they currently have a competitive advantage.)

These billing features would assist customers in cost control and management of costs, and in ensuring appropriate allocation of costs (especially for those firms which charge costs to departments or clients.) In general, more flexibility in billing would provide better control and more efficient use of resources.

Changes to 800 service

Lower minimums for Centrex and 800 service were mentioned by a large number of companies. (Small Centrex and the recently approved restructuring of 800 service go far to meet this requirement, but are not available from every telephone company.)

Many respondents drew comparisons to American service providers and resellers in highlighting the weaknesses in Canadian 800 service.

> *"We need to eliminate the need to specify zones up front."*
>
> *"We took out an ad and most of it had to be devoted to a map which showed the correct 800 number to call in each part of Canada."*
>
> *"We should be able to shift from incoming to outgoing trunks based on seasonal requirements."*

Changes to Bell Canada's 800 service, now before the CRTC, will meet many of these demands. However, customers would like to see them implemented quickly, and in other jurisdictions as well.

a) Sectoral Differences

The differences have less to do with sector than with the nature of the industry and the degree of decentralization. Obviously consolidated billing is more of an issue for national organizations with many small offices.

b) Size Differences

Larger companies tend to be more concerned about billing than medium and small companies unless the company is in an industry segment such as professional services, where telecommunications costs are billed back to customers and clients. In those industries, detailed billing is an issue.

However even small customers expressed frustration with deciphering bills. Many stated that they want more detailed information provided with 800 service bills.

c) Comparison to US

Although American respondents had fewer complaints about billing, they did complain about the tariff requirements and the slowness with which some services are made available. One major US respondent expressed similar concerns to those mentioned in Canada: "The processes and procedures seem to be in the carriers' favour, not the client's favour. And we have too many account team shifts." Another said that they needed more flexibility in obtaining information at a corporate and divisional level. One respondent complained about the accuracy of their bills. A telemarketer also complained about the fact that the telcos take a percentage of the 900 service calls rather than charging a flat rate. Another mentioned a need for more flexible disaster recovery services.

4. Quality of Customer Service

Canadian respondents raised numerous concerns about the responsiveness of vendors to customer requirements, though several respondents went out of their way to praise their telcos for their responsiveness and service.

Opinions varied: one respondent with a national organization lauded one of the telcos, calling them "number one in service"; but another said that the same telco "is appalling and needs competition."

Complaints centred around slow response times in responding to customer requests for information, and the knowledgeability of staff. One respondent said that responses to requests for proposals are poor and that there are problems getting accurate quotes for prices. One respondent mentioned that delivery dates are missed without enough advance notification of the changed due date.

> *"The telco's willingness to meet our requirements and its sales and marketing support are appalling when compared to vendors on the data processing side."*
>
> *"We want circuits installed on a 24 hour basis, not 3 - 8 weeks."*
>
> *"If I treated my customers the way I am treated by the telephone company I would not have any customers."*
>
> *"It should be easier to get a handle on what a given service costs and when we'll reach a point that a new service would be justified. It is harder to make an informed decision in telecommunications than in any of our other inputs. You have to beat the bushes to find out what they've got and whether it's justified for you or not. If they have the service and I can find out about it, they'll do it. If not, they'll take their own sweet time."*
>
> *"We have to push to get anything different. They only respond when faced with a competitive threat."*

A number of respondents indicated dissatisfaction with the quality and knowledge levels of sales staff who are the "front line" of information to customers.

"The reps we get don't know the technology. The co- ordination across the country is terrible. The people who work with PBXs and with Networks don't know each other's products, which is a problem for us, since both are so important to how our whole system works."

"We'd like more consistent information on what our network is costing, and advice on how to optimize it. I have to chase our phone company rep — or I call Telecom Canada in Ottawa, which the telco doesn't like me to do, but that's OK. I'd like to see them be more proactive in telling us what's available. There are a lot of services that are hidden. If you know about them, you can get them."

"The general knowledge level of the reps is not high. I often know more than the sales rep, and I'm no expert. Mostly the sales and service people are great people as individuals, but they're stymied by the bureaucracy. And the customer service reps — they're supposed to be the front line interface with the customer, but many of them are far too junior for their job. They just don't know enough. The rest of the troops hide in the bushes. They'll talk to the CSR, but they won't talk to the customer. And by the time it's relayed through the CSR, the information is incomplete."

"It was interesting to compare getting quotes for our private network from the telcos and from companies like Motorola. The telcos sell bandwidth, then add, 'oh, by the way, you'll need some multiplexers.' The multiplexer vendors, on the other hand, sell equipment to take advantage of the bandwidth (for example, voice compression.) The telco told us they couldn't do voice compression above 32Kbps. We said 'your competitors are bidding it.' So they went away and figured out how they could do it. But what if we'd signed a contract for the bandwidth based on their first recommendation? They don't work with you that closely. You really have to push them. It's frustrating."

Some comments centered on the difficulty in co-ordinating services between different telephone companies:

"There is too much finger pointing between telcos"

"Internal communications within telcos is a problem. No one knows what anyone else is doing."

A final quote sums up the attitude of many customers we interviewed:

"Overall, we have reliable service and a reliable network. And there are well-meaning individuals at the phone companies. But the bureaucracies tie them up. I know that lately there's a lot of talk about emphasizing 'total quality' at the phone companies. Well, that's like taking a U-turn inside an oil tanker."

a) Sectoral Differences

There are no obvious sectoral differences although several companies with a heavy dataprocessing emphasis were particularly critical of telco sales and support, comparing them to service levels from their computer vendors. (Generally, they rated computer vendors' support much higher.)

b) Size Differences

National companies reported more difficulty in coordinating services across different telcos and, in general, have more complex requirements and therefore higher expectations. They also seemed more likely to complain about the knowledgeability

of sales staff, probably because they tend to have a higher level of technical expertise than respondents in smaller companies. In smaller companies, however, the respondents are often very knowledgeable about particular services such as 800 services which are essential to their businesses.

c) Comparison to US

While the sample is too small to provide conclusive results, it appears that Canadian businesses have more complaints about service than their US counterparts. At the same time, many of them indicate that they think the transmission quality in Canada is excellent but service is inferior.

Some US businesses also have complaints about service.

> *" In a nutshell, the Regional Bell Operating Companies [local service providers] are mediocre at best."*

H. IMPACT ON BUSINESS

1. International Competitiveness

Some of the Canadian companies interviewed compete in the US with US firms, but more stated that US firms compete with them in Canada.

Most large Canadian companies – and some of the smaller ones – said that they compete with US firms. In some cases they compete for development projects with divisions of their own company operating abroad. Most Canadian respondents stated that they are at a disadvantage because of higher telecommunications operating costs in Canada versus the United States, as well as less choice and availability in services.

One multinational company said that the high cost of telecommunications in Canada impedes their Canadian operation's ability to win manufacturing jobs and product mandates over other divisions within the international company, because the cost of communication within a multi- location work team is higher in Canada. This could lead to downsizing – or a lack of growth – in the Canadian operation, in favour of more cost-effective manufacturing sites.

For companies with American competitors there is no question that higher telecommunications costs put them at a disadvantage, particularly when the US competitor can operate some or all of its network out of the US. For example, reservation centres and catalog shopping operations in Canada face direct competition from US counterparts who pay considerably less for continent-wide 800 service than the Canadian companies do.

> *"It costs us more to run our call centres than it costs our US competitors. They can haul traffic further for less money. It's cost-effective for them to run single large call centres, with the associated economies and efficiencies. We would like to do that too, but the cost of hauling the traffic across the country is prohibitive. Networking our call centres with Network ACD has helped some of that, but we still don't have the same economies as if we could run one or two large call centres."*
>
> *"Our counterparts in the US pay much less, especially for 800 service. For example, we pay 15 cents a minute for US Sprint 800 calls from all over the US into Buffalo, but in Canada we pay 45 cents a minute for Canadian 800 calls. And even though we get US 800 rates into Buffalo, we still pay more than our US competitors, because we have to pay to bring those calls to Toronto. The fixed cost of the leased line from Buffalo to Toronto is more than the variable cost of the 800 service itself. We're exploring bringing this traffic to Toronto over a reseller's line – but it will still be more expensive than what our US competitors pay.*
>
> *"Our counterparts in the US take for granted things that are on our wish list. For example, we'd like to have voice messaging linked across Canada as in a single system – but the cost of bandwidth makes that prohibitive."*

This is particularly acute in industries hard hit by the recession such as the retail

industry. Not only are they concerned about cross border shopping where southern retailers have lower costs and can offer lower prices, but they are concerned with incursions by "stores without walls", entering the Canadian market through mail order sales supported by US based telecommunications services such as 800 services.

One respondent said:

> *"Retailers are dropping like flies. Even though telecommunications is not a large portion of our costs, in this environment every cent makes a difference."*

Similarly, in the resource industry,

> *"Exploration knows no borders. Telecommunications costs contribute to higher exploration costs in Canada. It may also be one factor contributing to the high cost of producing in areas which the company would like to develop but cannot afford to."*

Another respondent stated that American companies moving into Canada have a decided advantage in instances where they can use their American internal networks to provide services at a substantially lower cost.

In publishing, Canadian companies compete with American companies. Canadian subsidiaries of American firms often benefit from having work done south of the border using lower cost facilities with limited Canadian operations focused on selling. Another said the cost of telecommunications in Canada has hindered their ability to adapt to the market.

Some Canadian professional services providers said that they compete with US firms which benefit from reduced costs and better backup services. Others, for example in accounting and law firms outside the major cities, stated that they serve clients within their local area and do not compete with US firms at all.

Because of reduced networking costs, American companies can operate centralized call centres more efficiently. With better service and cost reduction Canadian companies say that they can compete more effectively.

a) Size

Some small companies stated that they compete with US companies and are disadvantaged because of the cost and complexity of Canadian 800 service. Interestingly enough, in our sample, more small companies than large companies indicated that moving some or all of their operation to the US because of the cost of telecommunication was a real possibility.

b) Comparison with US

Most US companies interviewed were unaware of cost or service differences between Canada and the US, and tended to consider telecommunications insignificant as a competitive issue.

"Our prices are better because of our buying power and inventories. Even when Canadians had to order by mail and took a month to get a shipment, they were ordering from us."

Another large US telecommunications-intensive company which competes with large Canadian firms said:

"Telecommunications gives US companies a cost advantage over Canadian companies although there are many other factors affecting their relative positions."

2. Business Decisions

Some Canadian respondents stated that telecommunications costs had influenced business decisions in the past two years, in that they had slowed the rate of innovation.

Two cited specific decisions regarding network configuration. For example, one large retailer said that the company's credit operation is regionally distributed because of the high transmission costs of linking to central sites. Another mentioned that certain products are marketed only in areas where they have access to local calling or Datapac, because 800 services are too expensive.

A number of respondents stated that their decisions to use certain technologies to provide new customer services and links to branches have been constrained by costs. Specific examples included videoconferencing and business television.

For service providers where telecommunications is part of the product, high costs have constrained expansion and limited their ability to get new business.

One said that the cost of telecommunications was a critical factor in a decision not to continue a large portion of their operations in another location. The problem was that the cost of transmission was prohibitive.

Another company is using Datapac – where they would have preferred dedicated links – because of cost.

Delays in service introduction have also affected business decisions:

"Our small city expansion was delayed because we had to wait for the Remote Call Forwarding implementation."

"The delay over ISDN has played havoc with our plans. It's affected our decisions on computer hardware and software, our phone system, and so on. We just haven't been able to move forward on the whole application."

"We wanted to relocate our head office, but the phone company couldn't move our phone number so we had to make do with our current location and remodel the building."

"The delay in ISDN availability has affected implementation of our new ACD network."

a) **Comparison to US**

Few American firms mentioned specific effects on major decisions although one said that the cost of dedicated service means that they could not justify satellite offices until they have 20 or 30 people for the office. (Their mode of operation is to link satellite offices by T-1.)

Another respondent mentioned that the decision to outsource was specifically a function of the costs of the network. One large American company stated "As a result of our new telecommunications dependence we can move into new markets [eg. Canada] or to lower cost labour markets." Another mentioned that teleconferencing allows them to service customers that are spread across the country.

More of the US firms appear to view themselves as operating within a global context; they discussed the need for global networking and advanced features in international telecommunications. In contrast, most of the Canadian respondents talked about services within Canada or to the US, rather than internationally. Most of the Canadian firms stated that they face competition within Canada from US firms, but fewer are themselves competing in the US or global markets.

Several US respondents spoke of ways in which new telecom services and reduced costs have facilitated business expansion. One large US professional service provider went so far as to say:

> *"New applications and reduced costs have been very beneficial. Telecommunications is a strategic enabler...with e-mail and data sharing desktop to desktop this gives us major strategic capability. New technologies are becoming available and because they are affordable, cost is not an issue in deciding to implement them."*

Two US professional services providers mentioned that the high cost of Canadian service has prevented their expansion into the Canadian market.

I. RESPONDENTS' OUTLOOK

1. Changes Wanted

Canadian respondents indicated that they anticipate – and want – a number of changes in telecommunications products, services and prices. They also would like to see some changes in the regulatory framework.

POLICY AND REGULATION

All of the respondents with operations across the country commented on the need for a national telecommunications policy and national regulation. (The interviews were conducted before the new Telecommunications Act was tabled.)

Many would like to see faster decisions from the CRTC, particularly in approving new services. Respondents mentioned:

- need to empower the CRTC to make decisions on a national basis
- need to have faster decisions regarding rates and tariffs

Several respondents were more dissatisfied with the CRTC than with the telcos. One respondent felt that Bell is doing a good job but that the CRTC has delayed approval of new services.

Several expressed a strong need for a consistent regulatory environment and clear national policies in telecommunications.

> *"Telecommunications is an infrastructure question. There is a lack of national policy, national focus. We need national regulation of all telecom – so we don't have to have separate deals with edmonton telephones, Sask Tel, and so on...We are talking about the future of Canada in 5-10 years. This is not just a question between customers and phone companies. We need a Canadian policy that puts the focus on international competition. Japan is our competitor, not the US. If Japan has 1500 ISDN nodes – why do we have none in Canada? Regulators should put less of their attention on questions like service to remote areas and the cost of local service – to focus more on how to make Canada more competitive internationally. And we're not optimistic that that will happen!"*

COSTS

Respondents are unanimous in wanting lower prices, in particular for DDD, 800, and T-1 service.

> *"High bandwidth is very important to us to reduce our non-telecom costs –for example, employee costs and office costs. We want to reduce costs without impacting service."*
>
> *"We would like private lines to be more cost- effective in Canada. The volumes needed to get the best prices from the carriers are horrendous. For example, we had to combine our traffic with that of our parent company to justify T-1 between 3 cities. We'd like to be able to justify T-1 into Atlantic Canada. That would increase our ability to react to the*

market, and would reduce our costs, which is key in a low-margin operation. Right now, telecommunications is a fixed cost, and is a fixed high cost. We'd like to reduce communications as a percentage of operating costs, whereas now it is rising as a percentage."

INDUSTRY STRUCTURE

Many respondents said that, in their view, competition will ensure more service choice and lower prices. Some argued that unbridled competition would identify the viable players.

One respondent stated that he wanted competition but did not want to see full deregulation because he is concerned with social impacts such as access in remote areas.

A few mentioned that they thought that the market should open up to American carriers. Others wanted an end to restrictions on "double border hop" transmission.

One respondent expressed concerns about concentration in the telecommunications industry, for example in terms of "the relationship between National Pagette and Bell Canada Enterprises." Some believe that there may be cross subsidization between services offered by a large carrier, which makes it difficult for small companies offering similar services to compete.

CONSISTENCY

Several respondents stated that they want more standardization in services, pricing and billing across the country.

SERVICE

Many respondents stated that they want the carriers to provide sales reps (and customer service representatives) of better and more consistent quality.

One mentioned "Less lobbying at high levels": he dislikes the political activity of the telcos.

SERVICE INNOVATION

A number of specific services which respondents would like to see were listed in the section on "Service Availability."

Generally respondents maintained that new services will help reduce costs and stimulate development of new products and services to customers. In the retail environment, for example, there are a wide range of home shopping options that would be considered if costs for high bandwidth dropped. In Insurance, there would be more services to agents. In other companies there was mention of using new applications such as videoconferencing and extending the application of telemarketing.

a) **Sectoral Differences**

In general, the telecom intensive segments tend to be more specific in their demands.

b) **Size Differences**

Larger companies tend to focus more on high speed service. Smaller companies are more concerned about voice services such as 800, although this varies more by industry than by size.

c) **Comparison to US**

Some US respondents mentioned that they want the same services as Canadians: in particular, ISDN and high speed switched services. One US respondent stressed the need for better service quality. Another argued for local competition and for the need for speedier regulatory processes.

2. Impact of Changes versus the Status Quo

Generally respondents maintained that new services will help reduce costs and stimulate development of new products and services to customers. In the retail environment, for example, there are a wide range of home shopping options that would be considered if costs for high bandwidth dropped. In insurance, there would be more services to agents. In other companies there was mention of using new applications such as videoconferencing and extending the application of telemarketing.

When asked what the impact on their business would be if they *don't* see these changes, responses varied.

Some stated that it would be "business as usual", although their growth and market expansion could not proceed as quickly as anticipated with the service and cost shifts they'd like.

Others were more blunt – particularly heavy users of 800 service, such as hospitality and telemarketing firms.

> *"If costs don't come down, we'll have to consider moving our call centre to the US. We want to stay in Canada, but we can't compete at this level. And that means that our job growth will move to the US. We'd still keep part of our operation in Canada, but probably not much."*
>
> *It is a two-sided coin: we can fail to win jobs which don't come to us, and we can also lose missions we have now which could go south. Inside our company, we're like the Canadian economy in microcosm. As the marketplace looks more to the North American context, we run a risk of more of our business being operated out of the US. That affects us personally – it could affect our own jobs – and it affects the number of jobs our company has in total in Canada. And it affects us externally as well: we have a concern*

that our customer base in Canada may fade away, move to the US. Telecom is a factor in this as well: high costs affect our customers as they do us."

"If we don't get lower costs – we will look to do our diversifying in the US. Our growth will migrate to the US, which has an impact on the number of new jobs we have in Canada. Telecom is not the only factor – labor costs are lower in the US too – but telecom is a component, even though it alone wouldn't make or break a deal."

"If we don't get lower costs, bringing more effective communications into reach, it will mean that the Canadian operations will likely stay about the same but our growth will be in the US, not in Canada. We see ourselves as a North American player, not just a Canadian player. The challenge is to become an international player. If we don't move in that direction, we will lose market share to European or Japanese players who will move into our markets."

Some said that given the recession, their businesses are precarious, and that while high telecommunications costs are not a deciding factor in the firm's survival, they would have an impact. Several multinationals said that the threat of downsizing in Canada in favour of operations in other countries is real.

A few said that moving Canadian operations south is a real possibility. The majority said that they are in Canada to stay, if they could survive. Still others said that without the changes they expected it would be business as usual, but the pace of innovation and expansion in their business would be slowed.

Several said that if rates did not fall they would look for ways to decrease telecommunications usage and would seek cheaper alternatives to deliver services.

A number said that it would slow service expansion to other locations.

J. CONCLUSIONS FROM THE SURVEY

Telecommunications is of strategic importance to most Canadian companies interviewed, large or small, though its relative importance varies by segment.

Many Canadian companies consider telecommunications to be an important component of their products and services.

Partly as a consequence of costs and service availability, Canadian companies use certain telecommunications technologies (for example, teleconferencing) far less than their American counterparts. Similarly, Canadian companies make less use of private networks and high speed data links, although they would like to be able to cost-justify them more readily.

Canadian companies believe that telecommunications costs and services affect their ability to compete internationally. While for many, the main impact is on profitability and their ability to provide innovative services, some claim that their company's very survival is at stake. A number of respondents said that moving all or part of their operations (particularly call centres) to the US is a real possibility. Others stated that relative telecommunications costs may inhibit growth in their Canadian operations: that their corporate growth will migrate to the US.

While high costs of switched long distance services and digital private lines are of concern to many Canadian companies, the availability and flexibility of services are also of concern. In addition, many customers feel that their carrier representatives lack knowledge and information about services available. Many customers – of all sizes – perceive the carriers as inflexible and not very willing to meet customer requirements. This concern was not carrier-specific: it was voiced by customers across the country, served by various telephone companies as well as by Unitel.

Overall, respondents view telecommunications as closely related to their business prospects. If they can obtain lower costs and more services, they anticipate using the technology to serve customers better, improve their competitive position, and expand markets – all of which imply job growth in Canada. On the other hand, if these changes don't materialize, several companies anticipate that significant numbers of jobs will migrate to the US.

K. PERSPECTIVES OF MAJOR CANADIAN CARRIERS

We asked representatives of Bell and Unitel to discuss their views of why there are such large cost and service differences between Canada and the US. The key points raised by each carrier are summarized here.

1. Bell Canada / Stentor

The following individuals participated in a joint interview for this study:

Doug Carruthers (Assistant Vice-President Planning and Standards Research, Bell Canada)
Bernard Courtois (Vice-President Law & Regulatory Affairs, Bell Canada)
Marc Davidson (Assistant Vice-President, International Marketing, Stentor)
George Hariton (Assistant Vice-President, Engineering Economics)
Jim Schram (Assistant Vice-President, Large Business Marketing, Bell Canada)
Carol Stephenson (Assistant Vice-President, Rates and Policy, Bell Canada)

Bell's view is that historically, Canadian long distance prices have remained high because they heavily subsidize local service. This decision is as much a result of regulation and policy as of telephone company inclination.

The decision not to implement Signalling System 6 in the network in the early 1980s, but to wait for Signalling System 7, resulted in Canadian telcos being unable to offer some of the services introduced in the US (eg.advanced 800 services) during the last part of the decade. Now that Signalling System 7 is deployed in Canada — and more widely than in the US — the differential in the range of services can be quickly erased.

The underlying cost of network provision *for dedicated services* in Canada remains higher than in the US, because of differences in actual and potential traffic loads. Canadian carriers don't have the economies of scale on T-1 which exist in the US, because of the low density of population and vast geographic distances in Canada.

As a result, the end-user price of T-1 services and other dedicated line services is higher than the US and will likely remain higher. Canadian T-1 prices have been falling, but the underlying cost differences between Canada and the US make it difficult to reduce Canadian T-1 rates to US levels.

However, Bell says that its cost per minute on the *switched services* carried over the network is now (in 1992) *as low or lower than any carrier in North America*: equal to MCI's, and lower than AT&T's.

That means that Bell has considerable manoeuvering room to reduce prices on switched long distance services. This applies not only to existing services such as DDD, WATS, Advantage and 800 services, but also to new switched long distance services, such as Virtual Private Network services.

Bell's direction will be to migrate high-volume users to VPN services for both voice and data applications. This will allow Bell to offer customers the benefits of private networks while riding on the low costs of the switched network. However, Bell expects that large customers will continue to use hybrid networks (with a mix of dedicated and switched services) well into the late 1990s.

Bell also says that reducing long distance prices quickly to US levels will force the telcos to refocus on the question of rate rebalancing: that in order to reduce long distance rates as dramatically as Canadian users want and need, local services must contribute more revenue.

This could occur partly through revenues from optional local services, but Bell says that revenues from basic service will likely have to rise as well, depending on the extent to which competition in long distance affects the sustainability of the contribution from long distance to local service.

Bell also points out that Canada does not have the separation between local carriers and long distance carriers which exists in the US. They believe that this gives Canada an advantage, in that regulation can be more nearly national, and without the costs inherent in a multi-layered industry structure.

2. Unitel Communications

Unitel participated by setting up an interview with:

David Watt (Vice-President, Pricing and Economics, Unitel Communications)

Unitel says that the cost of providing dedicated service is high in Canada, and that T-1 rates cannot fall much further. In fact, they believe that Bell Canada is currently losing money in the "competitive network" category (private lines).

Unitel also thinks that US carriers are pricing T-1 based on marginal cost, not fully distributed costs. In other words, Unitel thinks that US T-1 prices may be lower than the full cost of providing the services. (In Unitel's view, US T-1 prices are set to encourage the sale of excess capacity in the network, and do not fully take into account the cost of network provisioning if this were allocated across all services including T-1.)

Unitel believes that economies of scale do not support arguments in favour of monopoly provision of switched long distance telecommunications service. In their view, the economies are such that relatively small carriers can be as productive as larger ones. Unitel points to the fact that MCI has lower costs per minute than AT&T.

Unitel's application to provide switched long distance service in Canada is based on the view that the *cost structure* of providing switched service is such that Canada's long distance rates can fall dramatically.

Unitel states that, if its application to provide switched voice long distance services in Canada is approved, Unitel will move as quickly as possible to fill the service gaps identified by respondents in this study.

Unitel believes that the level of the long distance subsidy of local service is a public policy decision. Unitel has not proposed a shift in this level.

Unitel's position is that long distance rates can be reduced through competition, which will lower costs and expand the market. If a public policy decision did lower the subsidy to local service from long distance services, this would reduce or eliminate the "contribution fees" which Unitel, in its current business plan, assumes it will have to pay to the telephone companies as its share of the subsidy to local service.

L. RECOMMENDATIONS

Based on input from the interviews with users and carriers, we suggest the following recommendations for the Department of Communications to consider in formulating its policy directions:

1. Priority should be placed on significantly reducing the overall prices of long distance services to Canadian customers, across all services, in all provinces, and for all sizes of organization.

   We make no recommendation on local service pricing; we believe this requires further study. Certainly there will be objections from both residential and business users if local rates go up. For many small and medium businesses, local service is at least as important as long distance service, and increased costs in this area would inhibit their growth.

2. Equal priority should be placed on reducing the time required to *introduce* and *approve* new services, both at the carrier level and the regulatory level. Carriers should be encouraged to provide innovative services based on customer input. Greater consistency in services and pricing structures across the country should be encouraged, so that businesses can use similar approaches in choosing services, wherever they are located in Canada.

3. Encouragement should be given to activities which assist businesses – in particular, small and medium businesses – to understand the available technologies and how they can be applied in creative ways to make the businesses more effective and productive. Useful educational activities could include seminars and demonstrations; they could be organized by government bodies, suppliers, user organizations, or any of these working together in combination.

APPENDIX 1. GLOSSARY

Following are brief definitions of some of the acronyms and terms which appear in this report:

ACD **Automatic Call Distributor.** System used to answer large volumes of incoming calls and distribute them equitably among telephone agents.

ANI **Automatic Number Identification.** Network feature which electronically delivers the originating telephone number at the same time as the call.

BRI **Basic Rate Interface.** ISDN option designed to replace single telephone lines. Supports 2 voice or data channels and 1 control channel.

Bps **Bits Per Second.**

CCS6 **Common Channel Signalling System 6.** Analog system for distributing control information in a public telephone network.

CCS7 **Common Channel Signalling System 7.** Digital system for distributing control information in a public telephone network.

CDR **Call Detail Recording.** Feature or system which produces computer reports on long distance usage on a PBX.

Centrex PBX-like system in which the switching equipment is located on the telephone company's premises.

CLID **Calling Line Identification.** Similar to ANI. Provides calling number information to receiver of call.

CMS **Call Management Services.** Canadian term for a family of *local* network services including CLID.

CRTC **Canadian Radio-television and Telecommunications Commission.** Federal regulator of telecommunications.

DDD **Direct Distance Dialing.** Long distance calling dialed by the customer, with no operator assistance.

DID **Direct In Dial.** PBX feature which permits extensions to be dialed directly from outside phones, without operator assistance, using a 7-digit number.

DISA **Direct Inward System Access.** PBX feature which permits outside access to PBX features.

DS0 **Digital Service, Level 0.** Dedicated digital circuit which supports 1 standard voice channel (64 Kbps).

DS1 **Digital Service, Level 1.** Dedicated digital circuit which supports 24 standard voice channels. See T-1.

DS3 **Digital Service, Level 3.** Dedicated digital circuit which supports 672 standard voice channels. See T-3.

EDI **Electronic Data Interchange.** Electronic exchange of commercial documents.

FAX **Facsimile.** Device or technology which transmits printed information over telephone lines.

FDDI **Fiber Distributed Data Interface.** Standard for 100 Mbps Local Area Networks.

FX **Foreign Exchange.** Telephone number or line which terminates on a telephone system which is outside of its normal exchange area.

ISDN **Integrated Services Digital Network.** Set of international standards for digital telecommunications.

IVR **Interactive Voice Response.** Equipment or service which permits callers to retrieve information from computers. Input is by a touch-tone phone; response is by computer-generated voice.

IX **Inter Exchange.** Any service which crosses exchange boundaries.

Kbps **Kilobits per second.** Thousands of bits per second.

LAN **Local Area Network.** High speed data network designed to work within a single building. Examples: Ethernet, Token Ring.

MTS **Message Toll Service.** Switched long distance telephone service.

OPX **Off-Premises Extension.** A PBX extension on a telephone which is not in the same building as the PBX switching equipment.

PBX **Private Branch Exchange.** Business telephone switching equipment which allows users to make outside calls by dialing "9" or some other code.

PCN **Personal Communications Network.** Network which provides personal cordless telephones.

PCS **Personal Communications Services.** Network features which allow users to receive calls regardless of their location. May be associated with PCN.

POS **Point of Sale.** A POS Terminal is a cash register/terminal, connected to a central computer database. Typical applications: retail store, restaurant in hotel.

PRI **Primary Rate Interface.** ISDN option designed to replace multiple PBX trunks. Supports 23 voice or data channels and 1 control channel.

PSTN **Public Switched Telephone Network.** The public telephone network.

RBOC **Regional Bell Operating Company.** One of the seven holding companies which have provided local telephone service in the US since the break up of AT&T.

RCF **Remote Call Forwarding.** Network service which allows a call to be automatically redirected to a remote location.

RFP **Request for Proposal.** Document which solicits proposals for new communications equipment or services.

SS6 **Signaling System 6.** See CCS6.

SS7 **Signaling System 7.** See CCS7.

Telco **Telephone Company.**

T-1 Dedicated digital circuit which supports 24 standard voice channels. Often used as a synonym for DS-1.

T-3 Dedicated digital circuit which supports 672 standard voice channels. Often used as a synonym for DS-3.

VPN **Virtual Private Network.** Service for multi-location organizations. Uses the PSTN to simulate a private corporate telephone network.

VSAT **Very Small Aperture Terminal.** Satellite receiving antenna for data.

WATS **Wide Area Telephone Service.** Bulk-rate long distance telephone service.

X.25 Standard for transmitting data over networks in the form of "packets."

APPENDIX 2. RESEARCH METHODOLOGY

Information was gathered through individual interviews. The interview method was selected in order to encourage greater richness of description, and greater variety of response, than would be possible with a method requiring respondents to answer within a standardized format (for example, a mailed questionnaire.)

Interviewing is, however, a time-intensive research method. In order to maximize the number of businesses which could be surveyed in the time available, interviews were conducted by telephone. Because telephone interviewing eliminates any travel component, this method also permitted us to survey businesses which are geographically widely dispersed.

The interviews explored the role of telecommunications in each organization in some depth. Each interview lasted for between half an hour and an hour. Each respondent was sent, in advance, a summary of the topic area to be explored in the interview; this permitted them to consult colleagues and gather summary information in advance of the actual interview.

The time available for the project permitted no more than approximately 60 interviews: 30 in Canada and 30 in the US. (The final number included an additional five Canadian respondents, for a total of 65 companies interviewed.) Within this size constraint, it was considered important that the sample be as representative as possible – including small and medium businesses as well as large ones, and representing businesses in various regions and various industry sectors.

The project definition included focusing on "telecom-intensive" organizations: i.e. businesses for whom telecommunications is important to how they do business.

The sample was constructed by the quota method: the project design determined in advance how many organizations to include in each size group, region, and industry sector. Approaches were made within each category to organizations who had indicated a significant interest in telecommunications – by attendance at industry educational events, membership in telecommunications-related organizations, subscriptions to telecommunications publications, participation in public forums on telecommunications, as well as by word of mouth or mentions in the press.

Respondents were given the option of being interviewed in French or English.

It is important to point out that this type of sample is broadly "representative" (because it is constructed to be so) but is not intended necessarily to represent the *average* or *typical* business. The value of this type of study is the range of qualitative information obtained; it is not intended to produce results statistically generalizable to the entire business population. In the body of the report, occasional numeric summaries of responses are reported; these should be taken as descriptive only.

APPENDIX 3. PARTICIPANTS IN THE STUDY

Canadian Companies

Agnico Eagle Mines
Canada Facts
Canadian Airlines
Check Ins, Ltd.
Delta Hotels Ltd
DMS Management Services
Fine Line Communications
Fraser Inc
Hongkong Bank of Canada
Hudson's Bay Co
IBM Canada
IPSCO Inc
ISM Info Systems Management Corp
JS Crawford Trucking
Lee Valley Tools
Loblaw Companies Ltd.
Maclean Hunter Limited
Manufacturer's Life Insurance
Maritime Life Assurance Co
Mobil Oil Canada
Newfoundland & Labrador Computer Svcs
Norlite Technologies Inc.
Peat Marwick Stevenson Kellogg
Phillips & Vineberg
Phoneworks
Pizza 73
Poole Althouse & Clarke
Pratt & Whitney
Readers' Digest
Royal Bank of Canada
Steinberg's
Wallace Construction Specialties
Woodward Stores
Yellow Cab - Edmonton
Yellow Cab - Halifax

US Companies

Air Compak International
Associated Electric
Association Management Professionals
Boscov's Department Stores
Chapman & Moran
Company Car
Confertech
Cushman Darby Law
Ernst & Young
Gelet Enterprises
Gentner
Hecla Mining Company
Henry Schein
Hongkong Bank
Hopkins & Sutter
Horizon House Publications
IBM
IDG
Institute for the Future
J.C. Penney
John Alden Life Insurance
Matrixx Marketing
Optel Communications
Phone Programs
Pickwick Travel
Readers' Digest
Sinet Bank
United Technology Corp.
US Air
Yellow Cab Seattle

APPENDIX 4. CHARACTERISTICS OF THE SAMPLE

1. Segments

a) Size

The final sample consisted of 35 Canadian companies and 30 US companies, distributed by company size as follows:

	Number of Companies	
	Canadian	US
large (over 1,000 employees)	16	12
medium (100 - 1,000 employees)	9	8
small (up to 100 employees	10	10
TOTAL	35	30

Company size was defined by the number of employees, rather than by revenues, because employee size is more readily obtainable. Many private companies, particularly smaller ones, do not reveal revenue information, but are willing to state the number of employees in the organization.

The original plan was that the Canadian and US samples would each consist of 30 companies, 10 in each size category: small, medium, and large. In conducting the interviews, however, several companies thought to be "medium" proved to be "large".

The actual distribution of companies, by employee size, within each group in the sample is as follows:

	Range of employee sizes	
	Canadian	US
Large	1,350 - 60,000	3,000 - 190,000
Medium	170 - 650	135 - 890
Small	18 - 100	11 - 100

The Canadian and US samples are thus roughly equivalent within each size group. With the exception of one US firm – the one with 190,000 employees – the US companies interviewed are comparable in scale to the Canadian companies.

b) Geographic Distribution

The survey included companies located in each Canadian province except Prince Edward Island. The actual distribution was as follows:

Region	Province	Number of Companies	Region total
West	British Columbia	3	10
	Alberta	4	
	Saskatchewan	2	
	Manitoba	1	
Central	Ontario	14	19
	Quebec	5	
East	New Brunswick	1	6
	Nova Scotia	3	
	Newfoundland	2	
	TOTAL	35	35

Many "large" companies, and some of the "medium" ones as well, have locations in several provinces; in the above distribution, the tabulation is based on Canadian head office location.

The sample from each region includes companies in all three size ranges.

Companies interviewed in the US sample are similarly distributed across the country, located in states in the east, southeast, central, southcentral, midwest, northwest and southwest parts of the country. The objective was to include a wide geographic representation, though we did not attempt to match Canadian and US companies by region, since the economic implications of the various regions are very different in the two countries.

c) Industry Sectors

The objective was to include a wide range of companies within the sample, representing different sectors and uses of telecommunications.

The companies interviewed are distributed by industry sector as follows:

Sector	Canadian Sample	US Sample
Banking	2	2
Hospitality	3	2
Insurance	2	1
Manufacturing	5	4
Publishing	2	3
Professional Services	9	9
Resources	2	1
Retail	4	3
Transportation	4	4
Wholesale distribution	2	1

The Canadian and US samples were matched as closely as possible by industry segment, and size of company within the segment.

These sectors were chosen because they tend to be significant users of telecommunications. The sectors selected for the study are standard industry classifications for industries considered to be telecommunications intensive. This determination was based in part on the literature review (see Appendix 5) and in part on the results of other studies.

The International Communications Association (ICA) for example, did a survey in 1988 and again in 1989, to assess corporate expenditures on telecommunications as a percentage of sales. Financial Services at 4.9% was the most telecommunications intensive, followed by Office Equipment (1.7%), Transportation(1.65%), and Banks (1.5%). For the purposes of the current study, banks and financial services were grouped together, partly as a relection of the structure of the Canadian financial industry.

In the ICA study, Electrical and Electronics (0.8%) Aerospace (0.7%) were next. Again for the purposes of this study, manufacturers were not differentiated on the basis of product. Fashion and retail (0.6%) Insurance (0.45 %), Service industries (0.5%) were next with other manufacturers (0.45%) At the lower end of the scale were fuel (0.3%), Paper and Forest Products 0.3%) which were combined under Resources in this study.

It should be emphasized that the ICA study examined very large companies only.

Expenditures on telecommunications were considered to be one indicator of telecommunications intensity.

Similar segments were selected in the medium size and small company size categories.

We deliberately did not include government, health, and educational organizations in the sample – even though these are often telecommunications-intensive organizations – because the question of being competitive is more nebulous to define in their case. We restricted the sample to organizations whose objective is to make a profit, and which are subject to competitive pressures in their markets.

2. Company Ownership

Selection was based on where a company is located and does business, not by its ownership. Nevertheless, the Canadian sample includes Canadian-owned companies along with Canadian subsidiaries of foreign-owned (especially US- owned) companies. All of the companies in the US sample are US-owned.

	Canadian sample	US sample
Canadian owned	27	-
US-owned	6	30
other foreign ownership	2	-

Several of the companies in the US sample also have Canadian operations, and thus are at least somewhat familiar with the Canadian telecommunications environment and able to make comparisons. Similarly, the US-owned subsidiaries in the Canadian sample were able to make direct comparisons to costs and services available to their US parent. Many Canadian-owned companies also have direct experience with US services and costs – some because they do business there, others because they have discussed the question with colleagues in the US or follow US publications and media.

3. Telecommunications Budgets

Annual expenditures on telecommunications (excluding equipment) were within the ranges indicated below:

	Range of expenditures ($000)	
	Canadian Sample	**US Sample**
Large	$200 - $120,000	$3,400 - $200,000
Medium	$100 - $1,000	$120 - $1,000
Small	$30 - $350	$30 - $250
Figures are given in national currency, not converted.		

These figures confirm that the companies interviewed in Canada and the US are comparable in the scale of their telecommunications budgets. (It is not meaningful to use these ranges to draw conclusions about comparative costs in the two countries, however: these are total expenditure figures, not matched in any way by type of service or volume of use.)

The range of expenditures reported by the "small" group of companies shows that these indeed focus on the telecommunications-intensive portion of the small business sector. The Canadian Federation of Independent Business study described in Appendix 5 indicates that two-thirds of small businesses spend less than $28,500 per year on telecommunications, with the *average* annual expenditure by small businesses being $10,500.

APPENDIX 5. LITERATURE SURVEY

1. Price and Service Differences

There appears to be near-unanimity on this question: Canadian business users face higher costs and have access to fewer services than are available to US businesses. This particularly affects telecommunications-intensive businesses.

a) PRICE DIFFERENCES: REVIEW OF STUDIES

Hoey Study

This study, published in 1989, compared daytime MTS (direct-dialled long distance) rates for Telecom Canada and AT&T. It concluded that Canadian long distance rates in 1989 were about twice as high as US rates, with the exception of short-haul calls (under 20 miles). Canadian calls over 80 miles were priced at a multiple of 151% - 210% of US rates for calls of the same distance.

Brown Studies

In February 1991, Brown found that "business services, almost without exception, are priced far higher than they are in the US — in fact as much as 4.5 times as high. Message Toll Service (MTS), High Speed Digital Services (DS0 benchmark, Dataroute) and Packet Switched Services (Datapac) are all more expensive in Canada with very minor exceptions."

Brown's February 1991 report updates the Hoey 1989 MTS comparisons using January 1991 rates, and finds that Canadian rates continue to be higher than US rates for call distances over 20 miles. Canadian calls over 80 miles are priced at a multiple of 150% - 178% of US rates for calls of the same distance.

Other 1991 rate comparisons (Canadian rate as a % multiple of US rate:

- DS0 rates: 280% - 456%
- DS1 rates: 210% - 414%
- DS3 rates: 448% at 100 miles, 146% at 2000 miles, 115% at 3000 miles
- The Dataroute comparison is somewhat complex. Brown summarizes: "Dataroute rates are, in general, considerably more expensive (up to 356%) than AT&T's rates for the equivalent service. The exception is the long distance (over 2000 miles) 56 Kbps rate. This possibly shows concern by Telecom Canada about bypass potential."
- Datapac rates: "Canadians pay from 40% less to 2.5 times more than Americans for this services. Canadian packet rates discriminate by municipality (e packet charges from Toronto to Markham, Ontario, 18 miles away are four times greater than sending the same traffic to Ottawa, a distance of

219 miles.)" In another article, published in April 1991 (see *TELEMANAGEMENT* #84) Brown points out that Bell has eliminated the "grade of office" distinction. However, Brown maintains that end-to-end usage costs in Canada remain much higher for Datapac users.

Ford Study

This study compares the cost of services used by four medium to large Canadian companies which used the following services:

- local analog private line services
- interexchange analog private line services
- local digital private line services at 1.2, 2.4, 4.8, 19.2 and 56 Kbps
- interexchange digital private line services at 1.2, 2.4, 4.8, 19.2 and 56 Kbps
- Multiple DS0 services
- packet switched data services
- facsimile - non MTS

The study contrasts the rate structures of these services under current Canadian tariffs in 1990, proposed tariffs, and U.S. tariffs.

The effect of substituting US services varied significantly, depending on the specific applications, from a reduction of 32%, to an increase of 44% largely depending on the nature of use.

It concluded that the bottom line impact of the proposed Bell/Telecom Canada tariff revisions on data communications costs for the companies in the sample is not large, ranging from a reduction of 2% to an increase of 6%.

When small companies were compared, significant saving would result from conversion from Facsroute or MTS to US services.

Submissions to CRTC Regional Hearings

In February and March 1991, the CRTC held a series of nine regional hearings across Canada as part of the long distance competition proceedings. Many of the intervenors were business people, who came to make their views known. They represented a wide spectrum of businesses, from small to large and from a variety of business sectors.

Many gave impassioned descriptions of how telecommunications affect their business, and commented in particular on differences between the prices and services available to them and those available to their competitors in the US.

Excerpts from a number of these submissions appear in the Appendix. They are grouped by topic (e those commenting on cost issues, service issues, regional

disparity issues,etc.)

Many submissions noted that their costs of telecommunications service are considerably higher than those of their competitors in the US. We did not find any who commented that their costs are the same or lower in Canada.

OECD Study

The Organization for Economic Co-operation and Development (OECD) has proposed a methodology for comparing telecom costs between its member countries.

The report says that "ideally the basket weightings should reflect average telephone bills received by subscribers....[but] there is surprisingly little information available on user charges....PTOs are generally unwilling to release commercially sensitive information, especially in a competitive environment."

In the absence of comparative data on *user bills*, the OECD proposes comparing "baskets of charges" based on the ratio in *carrier revenues* between fixed costs (line charges and installation) and usage costs (both local and long distance). The OECD calculates separate baskets for business and residential charges, but does not differentiate further within the business category.

The 1990 OECD report uses 1989 data. Using its tables, the baskets of charges in Canada and the US to *business* subscribers are cited as follows, in 1989 $US:

Component	Canada	US
Fixed Costs (line charge + 1/5 installation charge)	$433.94	$174.67
Usage Charges (local and long distance)	$636.03	$900.95
Total Basket	$1,069.96	$1075.61

This model suggests that business telecommunications costs are about the same in the US and Canada. It is hard to reconcile this conclusion with those of the studies noted earlier, and also with the testimony of the participants in the CRTC regional hearings (excerpted in Appendix 6.)

We note however, that the OECD methodology lumps the charges to *all* businesses together, and does not attempt to differentiate between telecommunications-intensive businesses and other businesses. At the same time, most of the the other studies do not compare local service costs – though one study (see Angus, May 1990) which compared local *and* long distance costs found that the total telecommunications costs in Canada were still significantly higher.

The OECD report argues that MTS rates are still one of the most important measures of comparison in telecommunications costs between countries, more important than comparing (for example) packet switching or private line rates).

"Voice Telephony is only one part of a telecommunications policy evaluation matrix, but there are strong arguments to support the choice for detailed consideration. Firstly, the telephone service remains the most important part of the business of traditional Public Telecommunications Operators...(93.2% in Canada)....Between 1978 and 1987 the revenue base of the PTOs has become more diversified. However, this trend has been partly reversed in recent years because of the use of the PSTN, rather than specialized data communication networks, for facsimile and dial-up data services....For the moment, PST tariff structures offer the best basis for inter-carrier comparisons." (p 24-25).

b) SERVICE DIFFERENCES: REVIEW OF STUDIES

Angus Study

This report examines an exhaustive list of switched interexchange services and options available in the US from five IX carriers, and notes which of these services were available in Canada as of August 1990. Service introduction dates in each country are given.

The report notes that the US carriers offer greater variety and flexibility in service features, access methods, customer control features, reports and management information provided to subscribers, billing methods and payment structures.

It noted that, of the many services and options introduced in the US since 1984, the majority were not yet available in Canada in 1990; others had been introduced in Canada after a time lag of 3-5 years after US service introduction.

A number of the services identified in this report as unavailable in Canada in 1990 have subsequently been filed for introduction by Bell Canada and other Telecom Canada members; several of these currently await CRTC approval.

Brown study

In his February 1991 report, Brown identified numerous "service voids" in Canada. These included:

- Automatic Number Identification
- Integrated Service Digital Network
- Virtual Private Networks (Software Defined Networks)
- High Speed Digital services

The report pointed out that "other services such as 800 service and billing are crude in comparison to US services."

c) CANADIAN CARRIER VIEWS

Costs

Bell Canada has indicated for some years that, in its view, long distance rates in Canada should fall.

> "Industries that use telecommunications intensively, the so-called information-intensive industries and others, are the sectors of the economy that are growing most rapidly. There are also industries that are highly competitive internationally and offer good opportunities for Canadian companies seeking business abroad. With the advent of an historic agreement on free trade with the United States, lower MTS/WATS rates must be achieved if all sectors of Canadian business are to compete fairly and equitably....It is vitally important to all businesses in Canada that the disparities between Canada and US long-distance rates be reduced." *1988 Rate Rebalancing Proceeding, Transcript, Vol 22 p 4844, cited in Englehart, 1989.)*

Bell Canada has argued that, overall, business costs in Canada are similar to those in the US, using a "basket of service" approach similar to that used by the OECD. Dale Orr, Bell Canada's Chief Economist, wrote in 1989 that the average charge per US business access line was only 5% less than the average charge per Bell Canada business access line. (See Orr in *TELEMANAGEMENT* # 67.) This comparison, however (in common with the OECD study) did not distinguish between telecommunications-intensive users and others.

More recently, Bell Canada and other Telecom Canada members appear to fully acknowledge that Canadian telecommunications costs for telecommunications-intensive businesses are much higher than those in the US.

In the "Bell Vision", Bell's submission to the long distance competition proceedings in November 1990, Bell promised – if it were assured of a monopoly environment – to reduce long distance charges to US levels for medium- to large-volume callers by 1996, without any increase in local rates:

> "Those [customers] who make greater use of long distance enjoy lower prices in the US. Canadian businesses, be they large or small, that make heavy use of long distance do not have access to the same range of service options and pricing discounts as their US counterparts. In this information age, these customers are increasingly important to Canada's future. *(Bell Vision, Vol 1, p. 5)*
>
> "This proposal includes rate reductions in the order of 60% for high volume users and 40% for medium users, thereby reaching US parity for these customers between now and 1996. *(Bell Vision, Vol 1, p. 16)*
>
> "Bell Canada's proposals do not incorporate general basic local service (primary exchange service) rate increases." *(Bell Vision, Vol 1, p. 67)*

BC Tel, in its evidence to the same proceeding, made similar promises to reduce long distance rates for medium- to high-volume callers, though BC Tel stated that it would require modest local rate increases to offset these reductions.

Services

As noted above, Bell Canada acknowledged in November 1990, in the "Bell Vision" document, that "Canadian businesses...do not have access to the same range of service options...as their US counterparts." (p. 5) That document goes on to promise that most of the service gaps would be filled:

> The service development plan includes enhancements to Advantage, Teleplus, Between Friends, Calling Card, Operator Services, WATS, 800 Service, 900 Service, Customer Network Control services and teleconferencing as well as introduction of new targeted discount options like contract-based revenue volume discounts. WATS and 800 will be restructured to enhance their flexibility and to position these services as major vehicles for delivering targeted reductions to large and medium users. Integrated Voice Messaging Services will also be introduced to complement Custom Calling Features and Call Management Services for residence and small business customers."(*Bell Vision*, p. 17)

In the intervening period, many of these services have been filed with the CRTC: for example, restructuring of WATS and 800 service, and ISDN service. These include enhanced service options as well as cost-reduction components.

d) WHY ARE THERE COST AND SERVICE DIFFERENCES?

A number of possible reasons have been put forward to explain why US carriers have provided lower prices and greater diversity of service than Canadian carriers:

- **Monopoly, no competition:** This is the argument generally advanced by Unitel and strong pro-competition proponents such as the Communications Competition Coalition. This argument has two variants. The first suggests that the monopoly carrier becomes complacent and unresponsive to the market; thus new services are introduced based on the carrier's own business needs, and not those of its customers. The other variant says that a monopoly provider is not forced to be efficient, resulting in a higher-than-necessary cost base. This latter view is illustrated by one of the submissions to the regional hearings on long distance:

  > "I had the pleasure some years back of interviewing the then President of the Newfoundland Telephone...When I reflect on the opulence of the office he was in and his reported salary, which I heard about a couple of years later, up in the hundreds of thousands of dollars, I asked myself: can Newfoundland consumers afford that? Is that part of good telephone service? My perception is that Newfoundland Telephone costs too much, in part because I think it is probably top-heavy with over-paid managers." *(Ray Penton, Jr., The Dream Company, St. John's Newfoundland, Feb 28, 1991, pp. 80-81).*

- **Geography:** Canada is a large country geographically, with a small population and market to support its telecommunications service. This argument says that costs in Canada are *necessarily* higher than in the US, and that our market is too small (in revenue terms) to achieve the economies of scale and scope possible in the US. This argument remains to be proven.

  The OECD says, on the one hand, that "it is to be expected that the cost base of different PTOs will differ considerably according to factors of geography, concentration of user base and economies of scale" (p 27), but also says that "the data provides no evidence for an 'economies of scale and scope' argument in European public telecommunications" (page 79).

  Bell Canada claims that it has made greater productivity gains in recent years than US carriers have. (Bell Vision, Vol 1, p. 4)

- **Regulatory delays.** Services may be filed with the CRTC and then take months or even years to approve. (Examples include 800 Plus services and Megalink ISDN services.) A factor here is the extent to which interventions from competitors prolong the regulatory process: for example, the various Advantage filings have all been contested by competitors.

- **Different regulatory environments.** Some have claimed that the FCC, with national jurisdiction, simplified the process of introducing new services and competition in the US. This argument ignores the extent to which state legislatures are responsible for local and intra-state services and rates – while Canadian provincial governments' jurisdiction over telecommunica-

tions has been sharply diminished by the Canadian courts – and the fact that the CRTC now regulates all provincial telcos except SaskTel and Manitoba Tel.

- **Delay in introducing SS7.** A number of the services identified by Angus in 1990 as "service gaps" – for example some of the enhanced 800 services – were possible in the US because carriers had implemented Signalling System 6, while Canadian carriers had decided to wait for Signalling System 7, which took longer to arrive than anticipated. (However, BC Tel had Signalling System 6 and nevertheless did not introduce these services.) Now that SS7 is nearing full-implementation in Canada, it seems possible that many of the service gaps can be quickly filled.
- **High cross subsidies required for local service.** There has been little examination in the literature as to whether the *costs* of local service in Canada are out of line with those in the US, requiring a higher cross-subsidy. In any case, the US approach has eliminated this cross- subsidy. In Canada, rate rebalancing, – increasing the cost of local service – has been proposed, but a more recent variant is to introduce services which generate revenues from local service options. (Eg. call waiting, Call Management Services.)
- **Inefficiency of multiple telcos** to provide nation-wide service. For Telecom Canada members to introduce a service across the country, they must go through a protracted period of negotiations. Each telco has its own agenda and views of how to meet it. Services could be much more quickly introduced by a single body, or by a Telecom Canada with a much-streamlined decision process. (Bob Kearny, Bell Canada President, in conversation with Lis Angus and others at Bell Canada's **Gateways** demonstration, Toronto, October 1991. The establishment of Stentor in 1992 to facilitate joint planning and service development among the major Canadian telcos is clearly an attempt to address this inefficiency.)

The extent to which any of these, or all of them – or other factors – have affected cost and service levels in the past remains unclear, though the interviews with Unitel and Bell Canada conducted as part of this study were undertaken to further explore this question. The important question, of course, is which factors will continue to influence cost and service levels in the future. If any factors can be changed or compensated for, so that Canadian cost levels can drop and the range of services available can increase, that will be of benefit to Canadian customers and carriers alike.

2. Competitive Advantage

The extent to which telecommunications has strategic importance varies according to the vertical market segment.

Increasingly, telecommunications is becoming a part of the *product* for many businesses, making telecommunications a strategic input. For example:

- in banking, telecommunications is part of the service
- in many industries from pizza, airlines, catalogue sales, a completed call is a sale
- in courier/freight, 50% of the service is delivery the other half is information
- in service companies (consulting, law, accounting) accurate billing is key and so is call management

In other industries, telecommunications is an important part of *service*:

- in retail, point of sale tied to inventory an on-line credit verification
- in automotive, EDI is becoming critical in managing production

In every segment, long distance services are important. However further analysis of typical budgets could include percentage of sales, voice versus data transmission, extent to which they use alternate services, private networks etc. These may vary significantly depending on the vertical market and size of the company.

- Most large companies have transnational links
- The trend towards distributed processing is increasing the need for high speed links connecting Local Area Networks

In some industries with a local focus, such as real estate or fast food retail, long distance services are less important. However a significant increase in local services or the introduction, for example of local measured service would be a major problem.

In every cell on the size/industry matrix there are bleeders, leaders and receders, whose spending patterns vary significantly, depending on the extent to which they invest.

Some applications, such as EDI and POS credit verification, are driven by large companies and draw in smaller companies which must use the technology or be disadvantaged.

Many segments use telemarketing for sales and credit collection, companies which are disadvantaged are those operating on a national scale.

Major disadvantages are to companies which are large enough to be distributed over a large geographic area but not large enough to gain any economies of scale.

In most segments, incoming call management is important. Incoming toll free numbers are used in a wide variety of segments to provide customers service, direct mail and television advertising, help lines etc.

Characteristics in terms of telecom use are similar in vertical markets regardless of size although larger companies have many more opportunities to achieve economies of scale and introduce new applications.

Strategic applications of telecommunications may be found at any stage in the value chain: linking corporations to their suppliers; tying together decentralized operations; linking companies to their customers

- Inter-company links pose additional challenges
- Telecommunications can offer competitive advantages by locking in customers, providing new services, improving efficiency and responsiveness
- Depending on the industry and the company, telecommunications may be treated as a operating expense with little planning, an internal utility with cost control emphasis or as a strategic resource
- Telecommunications can reduce barriers posed by distance by allowing sales forces to get closer to the customer and maintained linked to central information and decision making
- Telecommunications provides opportunities to improve internal efficiency and information flow in a decentralized organization through electronic mail, teleconferencing etc.
- Telecommunications is often the single largest operating expense after salaries and services which reduce costs can have a significant effect on the bottom line
- Telecommunications allows tighter connections with suppliers and inventory management through EDI and CIM
- Telecommunications can provide improved products and customer service through interactive voice response, telemarketing, 1-800 services
- Trend is towards integration of voice, data and image in some sectors such as financial but they still tend to be managed separately in others such as retail
- Image for document management and engineering applications will significantly increase bandwidth requirements
- The trend is towards increasing data and other traffic relative to voice but voice still dominates
- Expenditures and organizational structure and reporting relationships tend to reflect strategic importance

- Criticality of security and disaster recovery vary
- Degree of centralization varies

Management of networks in many Canadian subsidiaries is shifting to the US - eg. Union Carbide.

Outsourcing is appearing particularly in industries where the network is not part of product.

Further notes:

- Shared concerns of large companies include: pricing levels, service availability, regulatory issues, standards, international links, consistency.
- Many medium and large corporations are using long distance resellers and many are using bypass technologies.
- Unlike American companies, few Canadian companies have exploited opportunities for teletraining.
- There is limited use of value added networks.
- Use of cellular and mobile is relatively high compared to the US.
- Use of Centrex is significantly higher in Canada than in the US.
- Concerns regarding international competitiveness and globalization have accelerated with free trade.
- Multi-vendor networks are the norm but some companies have made strategic commitments to a principal supplier.
- Network management is a key issue.
- Large companies often have national or international operations in which telecommunications is a significant part of operating expenses and, in some sectors, of strategic importance.
- most regard telecommunications as important; even if it is not strategic it is a large percentage of operating expenses.
- the most telecommunications intensive segment is finance.

a) LARGE BUSINESS SEGMENT – VERTICAL MARKET ISSUES

MANUFACTURING

Holding inventory is expensive and cost control can be strategic. Applications vary significantly depending on the specific industry and its market. Because access to markets and suppliers is key, manufacturers tend not to be highly decentralized although they may be supported by sales offices spread across the country. Competition with the US is a key issue for manufacturers particularly in light of the free trade agreement and telecommunications costs are an issue which may affect location decisions. As well, some manufacturers have taken advantage of the technology to handle increasing amounts of financial management previously done by banks.

RETAIL INDUSTRY

Inventory management and customer service are key issues. Retailers are often highly decentralized with outlets scattered across the country. While overall telecom budgets may be substantial, they often have difficulties establishing the economies of scale required to take advantage of discounts, private networks and advanced applications. Competition from US retailers, who have better purchasing power and lower costs, is becoming a major strategic concern. Ability to stock in response to changing trends and local requirements is a key competitive advantage and accomplished in the US through use of telecommunications.

SHIPPING

Increasingly, access to information is being viewed as a part of the service provided by shipping companies and most are in the process of implementing real time tracking systems. Reliable information is almost as important as reliable delivery. This is an industry that is becoming telecommunications intensive.

PUBLISHING

In the publishing industry, especially newspaper publishing, the ability to access and distribute timely information is key. Rather than shipping newspapers across the country, newspapers with national aspirations are distributing them electronically and printing them locally. News wire services are telecommunications intensive. Handling incoming callers for advertising and other purposes is also critical. many publishers consider themselves information companies and offer on-line as well as printed information sources. For specialized information providers, timeliness is critical.

INSURANCE

The insurance industry depends on sales agents with access to relevant information. It involves large corporate and regional offices as well as independent agents and brokers who must be tied to essential information.

REAL ESTATE

As with insurance, real estate includes large companies, small agents and brokers who must have ready access to information on the one hand and be accessible by prospective as customers on the other. Most real estate agents, however, work in a local area.

FINANCIAL

Of all industry segments, the financial industry is probably the most telecommunications intensive as telecommunications forms an increasing part of the product. Large banks in Canada are national in scope with a constant need for remote access to large databases of information in order to provide customers with services. With growing threats from other financial institutions such as credit providers and insurance companies, banks are sensitive to the costs of telecommunications.

RESOURCE INDUSTRIES

Extraction may be remote from processing and sales operations, maintaining links is critical because products are largely undifferentiated.

AIRLINES

On-line reservation systems revolutionized airline industry in 1970's and telecommunications has continued to be critical. (See excerpt from submission of Paul Nelson of Gemini.)

b) MEDIUM-SIZED BUSINESS SEGMENT

This segment is defined for this study as including companies with 100 - 1000 employees and encompasses a broad range of vertical markets.

In some cases, they are less telecommunications intensive than larger companies in the same vertical segment because they are more local or regional in scope.

In other cases, they are national but are significantly disadvantaged because of their medium size in that they are unable to achieve the economies of scale needed

- Manufacturers in this segment are more specialized but may serve large market.
- Financial institutions in this segment tend to include Canadian branches of foreign banks, specialized institutions and a range of credit unions.
- In some cases, they are subsidiaries of foreign companies which operate only sales branches in Canada.
- There are a large number of resource companies.
- Most local utilities fall in this segment
- Some food products firms
- National wholesalers and distributors
- A number of chemical and pharmaceutical companies
- Retailers tend to be specialized
- Some high tech firms, consulting firms

Strategic Issues

- improving customer services
- coordinating decentralized organizations
- differences in US versus Canadian operations
- growth through expansion into new markets
- gaining competitive advantage or defining niche in market dominated by larger companies
- using telecommunications to differentiate products and services

Typical Applications

- Long Distance cost control through alternative service, chargeback etc.
- may use EDI to tie to larger companies
- Call Management to track costs especially in service companies
- Call Processing (Incoming call centres, Voice messaging)
- FAX for internal and external communications

- Distributed Design - Engineering/Architecture
- Teleconferencing and Electronic Mail for timely access to information

c) SMALL BUSINESS SEGMENT

This segment is defined, for the purpose of this study, as composed of companies with under 100 employees. It is a major source of new employment and business in Canada.

Telecommunications services are a vital and increasingly important component in the operation of small and medium sized Canadian businesses. Based on a survey of over 2000 small businesses in 1991, The Canadian Federation of Independent Business, concluded that:

- satisfaction with the telephone companies declined significantly since the previous survey in 1987. In 1987, 62.1 % of respondents indicated that they were satisfied with the value for money spent on telecommunications services, compared to only 43.2% in 1991. There was considerable provincial variation in the levels of satisfaction.
- There was significant variation in the expenditures on telecommunications: on average small business spent $875 per month on telecommunications with a standard deviation of $1500.
- Most of the expenditure was on long distance.
- 73.2 % either strongly supported or supported long distance competition.
- Most believed that competition would bring reduced prices (77.60 and over half (50.9%) believed that it would make service providers more responsive to their needs. Cost reduction was more important to medium firms while smaller firms appeared more concerned with responsiveness than medium firms.
- 8.7% opposed and 3.8% strongly opposed competition principally because they expected increased local rates would result and the remainder undecided.
- When asked about their interest in services, WATS (discounted outgoing long distance) was most commonly selected (64.9%), followed by call detail recording (44.3%) and 800 service (35.3%).

6. EXCERPTS FROM LONG DISTANCE HEARINGS

Excerpts from business' submissions on telecommunications and competitiveness, to the CRTC's regional hearings on long distance, held in February-March 1991.

1. Submissions on Cost Differentials

A recent experience might give you some insight. I had been considering installing an 800 service to provide 24-hour support as is offered by larger Canadian organizations and US enterprises. I had planned to forward our new line to residences of my employees after business hours to avoid the prohibitive costs of hiring new employees.

Upon further inquiry, however, I was told that not only will I not have the ability to call forward the line, but that I would also in some cases pay nearly double my current direct dialling charges to receive the calls.

After discussing this with a US colleague, I found that neither applied to his service. Further, I found that I was forced to pay for time in no less than one hour blocks meaning I inevitably would pay for unused time. I was also told that I would be unable to control and monitor these costs as no current information on bill status could be provided until after it was too late.

Mr. Chairman, to large organizations, this uncertainty might seem of little concern, but to a small business person trying to make ends meet, it can be crucial.

(Am Ahluwalia, Vancouver, British Columbia
February 26, 1991, pages 393-394).

However, if we revert to the analogy of the transportation networks, it is like having modern freeways covering the country, but having tolls so expensive we do not use the freeways as we might.

(Phillip Batt, Canadian Utilities Limited, Calgary, Alberta
March 6, 1991, page 554).

It is hurting our competitive position. Because our competitors are able, as a result of competition, to purchase this cost of doing business at a lesser price, Saskatchewan firms are losing out on these kinds of opportunities that this province must take advantage of if we are to effectively participate in an increasing competitive global economy.

(Norm Wallace, Wallace Construction Specialties, Regina, Saskatchewan
March 8, 1991, page 790).

WATS is a shining example. For years Manitobans have needed a separate access line to get WATS. If you wanted to take advantage of lower rates for different zones you needed multiple access lines. Recently Advantage Canada has been introduced, so now we can get a discount service over regular lines when we bill over $200 a month.

In the United States, regular WATS lines are lower, the discount is larger, there is no minimum monthly billing, and there are three types of access. Small business users do not require dedicated access lines, while major WATS users have the option of using T1 access or dedicated facilities, whatever best suits their requirements. As a result,

Manitoba businesses, but particularly small businesses, are being disadvantaged by not being able to realize savings that would otherwise be available to them.

Virtual private networks offering significant cost reductions and enhanced control and already available in the United States will not be available in Manitoba until sometime in 1992. Hence Manitobans are not able to avail themselves of the savings of their American counterparts.

Detailed consolidated billings, while unavailable but planned by Canadian telcos, are already offered by major American telcos. This places Manitobans at a competitive cost disadvantage as we are unable to monitor usage, control costs and optimize networks quickly and readily in response to changing market conditions.

On-demand dial-up access to high-speed T1 digital communication channels to allow bulk data transfer, video conferencing and private circuits for back-up reserve to private line services are not offered by the telcos. These services both enhance operational efficiency and reduce costs, thereby once again giving American business the edge.

Developments like ISDN and automatic number identification and the value added it gives to improving customer services and facilitating the creation of innovative uses of telecommunications to capture market share, while in trial mode in Canada, have been around for a while now as a feature of the public long distance network in the United States.

And lastly, prices are too high, with long distance being about double AT&T's interstate rates, and high capacity T1 services as much as three to five times more expensive.

Telecommunications that are viable in the United States are cost prohibitive and uneconomical in Canada, and when this happens we all stand to lose.

We could go on, the point being that the reality is that American companies have a host of competitive-priced services, many of which are available at lower rates than in Canada, and which in many cases are not available in Canada at all. The inevitability of all of this is that we have to compete with them to survive.

(Greg Hauser, Chamber of Commerce and Federal Industries Ltd., Winnipeg March 11, 1991, p 1151-1152.

I'm afraid if I was 30 years younger and trying to set up a talent agency and a production company, I would have to look at moving to the United States to do it, because not only the phone, but other aspects of doing business in that particular industry favour location there. (p. 621) ...

I feel that strongly about the costs that are involved in telephone long-distance charges in this country, that business flourishes and survives on the telephone. It is a very phone- oriented business, and long-distance is an integral part of it. Depending on the size of your operation, your particular years you're in, the particular projects, whether they're onstream at that time, they're all an integral part of your costs.

(Roy Warhurst, Sarcee Holdings Ltd., Calgary, Alberta March 6, 1991, page 623).

Telephone companies in Canada, or should I say the telephone monopolies, maintain the old high rates and reduced levels of service, because there is no choice or competitive arena. And in a lot of cases, business people like myself sit back and don't demand better from them.

But we all reach a point where we say, "To hell with them, there's got to be another way", and I went through various contortions and voyages of discovery, but I obtained

a better service than the one available locally, and at about one-third of the cost on average. At the same time, the telephone companies in Canada lost, the Canadian economy lost. Very small, but they lost. I was sending my dollars out of the country. (p. 1038) ...

Why is it that the telephone companies announce new revolutionary services or pending rate reductions every time they discover a customer utilizing other services, or when a potential competitor makes application to the CRTC? Why is it that the Canadian business telephone user has to pay a premium price for older technology when new innovations have appeared elsewhere at lower cost?

And why, for example, does business pay more for its connection than the residential user for a like type of connection? There are some things about the whole telephone tariff system that defy logic.

(Bert Wold, President, Incheck Ltd., Winnipeg, ManitobaM arch 11, 1991, page 1039).

Canadian long distance rates are 2.5 times more expensive than American long distance charges. DS1 normal rates are now 3.5 times more expensive than the United States. Our cross-border links between Longueil and Moors Forks costs approximately $6,000 for a distance of 38 miles. The American portion to Hartford, Connecticut is approximately 300 miles and costs $4,000 U.S. If our plants were located just 38 miles further south our costs would be significantly less.

(Sam Sonnenschein, Pratt & Whitney Canada, Montreal, Quebec March 11 1991, pages 98- 99).

Our primary competition for the Canadian customer is not from Canadian service providers. Our competition for Canadian business is the American service provider. When it is cheaper to place a 1-800 call from Toronto to Fargo, North Dakota, or to Omaha, Nebraska, than it is to place the same call to Winnipeg, Manitoba, there is something terribly wrong. (p 1182-1183) ...

The impact of this rate structure is obvious. Most Canadian 1-800 calls generated from Canadian television advertising connect in the United States. Telecom Canada should be nominated for an award from the United States Chamber of Commerce for the creation of jobs in the U.S. (p 1183) ...

Last week one of my colleagues, a senior vice president of a national Canadian paging company, left me a message. He left a 1-800 number that connected with a terminal on which I left a voice message. The 1-800 number was an MCI number terminating on his Canadian-owned equipment in the United States. Data was then transmitted along American circuits back to Canada to access his Winnipeg-based paging terminal to alert him to my message. Not a single Canadian regulation was broken. All that happened was that Canadian money moved from a Canadian company's bank account to the bank account of an American company, and the Canadian company saved money doing it.

(Merrill Shulman, President, Shulman Communications, Winnipeg, Manitoba March 11, 1991, page 1184).

In addition, the way that I get my U.S. costs down is by accessing my U.S. carrier through a T-1 line to Buffalo. This line costs $12,000 a month to run a distance of 100 miles. A line covering the same distance in the U.S. would cost me $3,000, or a quarter as much.

(Steve Gittins, Vice-President, Manulife, Toronto, Ontario
March 13, 1991, page 127).

I would like to cite some specific examples. The first – currently, in my teleconferencing operation, our costs are four times more expensive than an identical sister Darome office in the U.S.A. of the exact same size and volume of conference calls on a per month basis; four times larger than we are in Canada on a cost basis versus an exact same operation in the United States.

(Steve Moffatt, Darome Teleconferencing Canada Inc., Toronto, Ontario
March 13, 1991, page 245).

Like other companies in Canada, we are facing increasing competition from the United States. This isn't competition from companies that are coming over here and doing business in Canada. In our business, we are facing competition from companies that are sitting in the United States doing the same kind of business we are doing and using telecommunications to come into our country and really compete against us at a lower cost than we can provide. (p. 64) ...

In the United States, our company, with 110 or 120 telephone lines, would be a major competitor in the mid-west. If I could take every telephone line I pay for in this country, move down to the U.S. and pay exactly the same rate, I would become a major player in that country. But, instead, I have to decentralize my lines across the country because I can't afford to compete on the long distance rates. (p. 65) ...

I have seriously considered moving our operation. In fact, I have been down to Cedar Rapids, Iowa and I have talked to the teleconnects down there, and I have talked to the telecommunications people.

Quite frankly, we could do a more cost- competitive job for a national-type survey out of the United States if the client wants a central location facility where all of the interviewers are in one location – and our industry is going in that direction – if I was located in the United States. I would prefer to stay here.

(Yvor Thompson, President, Thompson Lightstone, Toronto, Ontario
March 12, 1991 (pages 66-67).

I have friends and relatives in the U.S. that I can call for less than I call my parents in Campbellford, Ontario, a mere half hour drive away.

Canadians are currently being charged 2.5 to 7 times the amount that our American neighbours are paying for comparable and sometimes better telecom services. This seems highly unreasonable and unjust. To add insult to injury, Americans have a greater selection of services and custom-tailored packages available to them.

(Glenn Dunnett, All Natural Green, Toronto, Ontario
March 13, 1991, pages 388-389).

Recently, EDS of Canada attempted to secure a computer graphics engineering contract on behalf of our largest customer, General Motors Canada. Unfortunately, this effort was unsuccessful as a direct result of telecommunications costs for high capacity

bandwidth. In a letter to EDS, the Markham, Ontario company stated that, "This enormous price difference may well leave us no choice but to perform all our CGS – computer graphics system - related engineering functions in the United States." The company ultimately decided to expand its Michigan operation. The loss of these design engineering jobs is contrary to Ontario's high technology job creation goals.

(Brian Black, E.D.S., Toronto, Ontario, Volume 3-A March 14, 1991, page 885).

We spend approximately $600 a month just communicating between the two companies. I have a company that I deal with in the United States which has an office in New York and an office in Los Angeles. They communicate about the same amount that we do, the New York and the L.A. offices together. I am using a very specific example here.

They tell me that their telephone and fax bills are approximately 65 percent of what mine are, yet I am competing in the same global marketplace as this company. I don't want to move to the United States. I am a Canadian and I would like to remain in Canada, and I would like to keep both of the companies in Toronto and Victoria for a number of reasons. I don't want to move them to Seattle and to south of the border.

Why can't Bell bring their prices down to be able to compete with the rest of the North American communications companies? That is one question. Second, as soon as one started to hear that there was another company that was going to get into this long distance communication market, what happened? Suddenly, there were all sorts of advertisements on television telling you how good they were.

(Les Harris, Canamedia Productions, Toronto, Ontario March 13, 1991, pages 196-197).

In addition, business services in Canada are generally priced far higher than they are in the U.S. Message toll service, high speed digital services and packet switched services are all more expensive in Canada, with very minor exceptions. Reductions in Canadian long distance rates continue to occur, yet it still costs about twice as much to make a long distance call in Canada as it does in the United States and high capacity digital rates are far more expensive, upwards of two to four times higher, in Canada than in the U.S.

(Terry Holmes, Vice-President and Finance Manager, General Motors, Toronto, Ont. March 14, 1991, Volume 3-A 831-832).

It is the security alarm industry's opinion that the rates being charged for services are artificially high in Canada and bear little relationship to the actual costs of providing the service. Under the current rates and tariffs, a one-minute 800 service call originating from British Columbia to Sarnia, Ontario costs approximately 78.3 cents Canadian. A similar one-minute call between Washington State and Port Huron, Michigan, which is located directly across the St. Clair River from my place of business, costs a maximum of 25.9 cents Canadian during the business day or 16.6 cents Canadian during nights and weekends. These are MCI rates.

Similarly, a one-minute call from British Columbia, originating in Canada and terminating in Port Huron, Michigan, costs a maximum of 56 cents daytime or 33 cents nighttime. This means that a competitor of mine located less than one mile from my operation can carry traffic for approximately one-half the cost that I incur from the same point of origin in Canada.

(David Currie, Vice-President, Canadian Alarm and Security Association, Toronto, Ont. March 13, 1991, Volume 2-A,pages 477-478).

In addition to these "service voids", significant rate disparities remain between Canada and the U.S.. Even Canadian T1 rates are still conservatively five times more expensive than the equivalent U.S. rates.

The current maximum discounted Bell rate for, say, a 2500-mile telephone call from Toronto to California, is about 34 cents Canadian a minute. A typical Canadian reseller's rate for the same call is about 25 cents a minute, while in the U.S. carrier rates for a 2500-mile call is as low as 15 cents Canadian per minute.

At Bell's maximum discounted rate, even with the many welcome reductions over the past couple of years, a short-haul call, say, from Toronto to Hamilton, about 40 miles, costs about 22 cents. In other words, it costs me 7 cents a minute more in Canada to call 40 miles than in the U.S. to call 2500 miles.

These price disparities and service voids not only impair our – my – ability to win missions from other IBM sites outside Canada and outside vendors in the U.S.A. and overseas, but as a worldwide consolidation of our computing facilities continue in Canada, around the world, could result in the transfer of existing Canadian operations and Canadian jobs to a more efficient operation in other countries.

(Dr. Gordon Davidson, Director of Computing and Telecommunications, IBM Canada, Toronto, Ont., March 14, 1991, pages 613-615).

Clearwater's telephone bill is approximately $900,000 per year and from our relationship with large U.S. companies, which we used to own, we know we could save about 40 percent of that telephone bill if we had U.S. telephone rates.

(Steven Green, Vice-President, Clearwater Lobster, Halifax, Nova Scotia February 26, 1991, page 30).

Let's take a look at our American clients and the manner in which we are currently forced to do business. Although we do have one transborder line for special projects, the majority of our calls from the United States terminate in an office in Portland, Maine. It is considerably cheaper to use AT&T services in the United States and terminate them in Portland than to bring the 800 lines across the border to terminate them in Halifax. This results in a loss of jobs in Nova Scotia and what we want is Nova Scotians working in Nova Scotia.

(Susan Russell, Systems Manager, Check Ins. Ltd., Halifax, Nova Scotia February 26, 1991, page 196-197).

Our business takes us into the US, and we want to access 1-800 numbers from Canada. The only way that this can be accomplished is by leasing a private line to the US. The Canadian portion of the line is bought from the telephone company and costs five times as much as the US portion, the distance being almost the same on either side of the border. (Andrena Mungham, Finning Limited, Vancouver BC, Feb 25, 1991.)

When we began to set up CANET [Canada's National Research Network] two years ago, half of our projected annual operating cost of $1.2 million was for communication costs. All we could afford was a 56 kilobit circuit across the country.

At the same time, the National Science Foundation, NSF NET in the U.S.A., was supporting a similar network at 1.5 million bits per second and is currently moving to 45 million bits per second.

The Hickling study for the Industry, Science and Technology Canada, on a national Canadian network, criticized CANET for being too slow to accomplish anything innovative, and the CANET Board agrees fully...

Yet, when the CANET Board was faced with communication costs eight to ten times higher than those in the U.S., we are forced to be followers. CANET's long-range plans have allowed upgrading to higher speed but only when we can afford it. (pp 40-41.) ...

Indications are that unless we can find another funding source – and we are actively working on that – the Prince Edward Island link to CANET will be shut down when our funding expires. That will be a major blow to our university researchers, our students and those in other PEI organizations who are learning to apply CANET.

(Jim Hancock, University of Prince Edward Island, Charlottetown, PEI February 25, 1991, p 44 .)

Gemini has a similar requirement to be freed from excessive tariffs to allow the development of new products and services in Canada. An example of restrictive tariffs is two high-speed communication lines that run from our data centre in Winnipeg to Detroit and Seattle respectively.

Our U.S. partner picks up these lines in both cities and carries them to their data centre in Denver. The cost for the Canadian side of the network is $70,000, or about eight times more than the cost of a similar service in the United States.

(Paul Nelson, President and Chief Executive Officer, The Gemini Group, Toronto, Ont. March 13, 1991, pages 175-176).

We need 800 number service. However, I have looked into it several times here, and looking into getting into debt again, getting into that market, into Saskatchewan and into Alberta; where I see my counterparts down in the United States virtually covering the whole of the United States with their 800 numbers, and we can't even afford to go into Saskatchewan or Northwestern Ontario, never mind buying an 800 number coming into Winnipeg.

(Richard Langtree, Empire Waterworks, Winnipeg, Manitoba March 11, 1991, page 1066).

2. Submissions on Service Differentials

I would like to discuss a number of services which the hotel industry is seeking.

WATS resale. Currently the CRTC rules permit private line resellers to offer long distance services in competition with the telephone company. The services of these resellers can be utilized by hotels, and for some of their calling needs – or the hotels could engage in private line resale themselves.

To date, these solutions are not cost effective for many hotels. WATS resale would be a great benefit to the hotel industry. WATS resale would allow resellers to offer universal termination, so that their offering would become more attractive. Second, hotels could utilize WATS resale themselves, and thereby recouping some of the costs of operating telecommunications services to their guests.

Operator and billing services. The hospitality industry utilizes a number of operator services which we obtain from the telephone companies, in order to serve our guests. When you stay in a hotel and dial a one-plus long distance call, frequently an operator comes on the line and asks you your room number. This operator is typically a telephone company operator.

The telephone company prepares the call record, which is forwarded to the hotel, generally shortly after the call has been made. This information then gets added to the guest's bill at the hotel. In addition, telephone company operators handle zero-plus calls and zero-minus calls.

Zero-plus calls allow the telephone company calling card to be used, or allow charges to be reversed or billed to a third party. Zero- minus calls allow the operator to place the call. In a competitive environment, we expect that Unitel and other long distance providers, will provide operator and billing services as well.

This will allow hotels to have a choice of operator service as providers. In the United States, the competitive providers of long distance services do indeed offer a choice of these services to the hotel industry. Along with a choice of different options, the hotel operators are able to reduce costs.

Commercial credit cards. Some guests do not have a telephone company calling card, but do not want the calls placed on their hotel bills. These guests in Canada cannot charge calls to commercial credit cards such as VISA, Mastercard or American Express.

In the United States, it is possible to charge calls to commercial credit cards. Indeed, AT&T has begun issuing commercial credit cards. We believe that in a competitive environment, the telephone company and their competitors would be required to seek new ways to serve customer needs. This would no doubt include the ability to charge telephone calls to commercial credit cards, which would provide added convenience and flexibility to our guests.

Pay phones. We believe that there is a significant market opportunity for long distance telephone company pay phones. We understand that Unitel is proposing to offer pay phones which place long distance telephone calls only on the Unitel network.

Such pay phones, perhaps combined with facsimile machines, would be a useful service for many hotel guests. Hotels would expect to share some of the revenue by leasing the space occupied by these phones. In a competitive environment, we expect such opportunities to arise which will provide not only revenue opportunities for the hotel, but also new and improved services for guests.

Services targeted at the hospitality industry. In a monopoly environment, suppliers can offer a limited range of services to guests. Customers have no choice but to take the services which are offered.

In contrast, in a competitive environment, suppliers will have an incentive to target specific services at customers. As an example, in the United States telecommunication competitors provide a number of attractive packages to the hospitality industry. MCI offers a service call Hotel Watts, which is specifically designed for hotels. Subscribers must have 45 percent of their calls taking place after regular business hours. There is not equivalent service in Canada.

(Gordon Zavediuk, B.C. Yukon Hotel Association, Vancouver, British Columbia February 25, 1991, pages 67-69).

To be specific, at this time Telecom Canada will not provide DID access to 1-800 circuits at any price. This is another technological advantage that my American competitor has: Telecom Canada members are not technologically deficient. If there was a will on the part of Telecom Canada or competitive incentive I am sure that the service would be available.

(Merrill Shulman, President, Shulman Communications, Winnipeg, Manitoba March 11, 1991, page 1186).

Point number two, greater variety of products and services. In the U.S., again, where competition exists, there are 25 different WATS products available to businesses to basically choose what service will best suit their needs. We have one WATS service available in Canada.

Similarly, for 800 services, there are 10 product offerings in the U.S. versus three in Canada.

New technologies become available sooner. For example, ISDN is not yet tariffed in Canada, while it is currently available as a commercial service in the U.S. (p. 538) ...

Point number two, carriers should be allowed to compete with a full range of services, that is long-distance, WATS services, 800 services, and tie lines.

(James Solohub, Director, Corporate Information Systems, Petro Canada, Calgary, Alberta, March 6, 1991, page 539).

Our American counterparts have available a number of features from their respective telcos which allow them to provide many services we in most parts of Canada are unable to provide. Some of these features are: call-forward when busy, and call-forward no answer. This service when programmed in telco switch provides for the immediate call-forwarding of a line to the telemessaging centre whether the line is busy or unanswered after a predetermined number of rings. This feature provides the benefit of call completion for the telco, and the business or residence user an answer to every call to his or her telephone. It generates revenue for both the telemessaging service, and if long distance, for the telco.

TNA or DID-800 service. This service is provided in the U.S., and is a group of 800 numbers rented by the telemessaging service similar to what we rent now and it's called telephone number access groups. We would rent these at competitive rates and be provided - - sorry, and they are to be provided to small businesses or for use of resell to businesses with the telemessaging service providing the access trunks, and the telco billing the small business user on a usage-sensitive basis.

The features mentioned are only two of many that the telemessaging industry enjoy in a competitive environment and which we do not have in Canada.

(Pauley Craik, President, Fine Line Communications Ltd., Winnipeg, Manitoba March 11, 1991, pages 1229-1230).

It is important that Canadian industry be able to compete by having advanced technologies and competitive services like those developed by the major U.S. telecommunications providers for use by their industries and our competitors. These services are much more extensive that those provided by our domestic telecommunications suppliers, but most important, are provided at rates which put us at a competitive disadvantage if we would like to provide services to our customers such as: dial-up video services, switched high-speed data services for engine test at customer sites, switched high-speed data for the exchange of engine test information between development partners, the exchange of computer aided design and manufacturing data between plants and customers, virtual private networking, disaster recovery access services effected through the use of switched high speed DS1 services to standby computer centres. (p. 94) ...

High speed digital services have come late to Canada. We required such services between two of our plants in Toronto to be able to provide computer-aided design and manufacturing to our employees at the two sites. We had to create competition for Bell by applying for a license to operate a microwave radio link to transmit data between our plants. This action encouraged the telephone company to provide service at a reasonable price. (pp 95-96)

It is not that Canada is behind in technology, as all the digital services are provided by hardware platforms developed by Northern Telecom. It is rather that this technology is delayed for five to ten years while higher cost, old technology is offered to its customers. It is only with increased competition that we will see this technology lag shortened dramatically.

(Sam Sonnenschein, Pratt & Whitney Canada, Montreal, Quebec March 11, 1991, pages 97-98).

We have developed business not only in Ontario and Quebec, but also have worked

with clients across the country, as well as in the United States and in Europe. In addition, we deal extensively with contacts and candidates in many different location. We make extensive use of the telephone and of long distance telephone. In 1990, for example, we spent over $60,000 for telephone costs for equipment and local service and over $15,000 on long distance telephone. In addition, we use the fax a great deal, particularly in the last two years.

We have investigated the use of an 800 service number, but have found that it is too expensive for a firm our size. Yet in checking with some of my associates in the United States, I find that they are able to have an 800 number at a fraction of the cost which would greatly facilitate our business.

(Patrick Rourke, Montreal, Quebec, March 11, page 204).

Our growth as a company is also predicated on our ability to provide value-added services which in turn are tied to their availability and/or costs of obtaining these services from the telephone companies. Case in point, the bulk of Voice and Data Systems revenues today are derived from sales of messaging services to subsidiaries of U.S. companies operating in Canada, in particular, the pharmaceutical and distribution industries. These companies have implemented in-house messaging systems and serv ices at their U.S. corporate offices or major locations. They can obtain, for instance, 800 services at such a price that it makes more sense financially to have Canadian users or subscribers to the service call to the United States to deposit messages and to receive messages, as opposed to continue to avail themselves of services provided by Canadian independent providers.

(Jim Earley, Voice and Data Systems, Montreal, Quebec, March 11, pages 519-520).

One of our members in Cambridge, Ontario recently lost a customer to a U.S. telemessaging firm which provided a Canada-U.S. - wide 800 number at $9.50 per month, plus usage sensitive billing, by a U.S. telco. I might add that, if that number were called by a U.S. telephone, it was billed at 35 cents a minute; if it was dialled by a Canadian telephone, it was billed at 75 cents per minute, a good portion of what competition brings. This customer cancelled his Bell 800 service because he no longer had any need for it.

The features mentioned are two only of many that the telemessaging industry enjoys in a competitive environment which we do not enjoy here in Canada.

(Ted Moses, Director, Canadian Associations of Message Exchanges, Toronto, Ontario, Volume 2-A, March 13, 1991, pages 465- 466).

I spend a fair bit of time during the year with my American counterparts generally drooling over their operations, concentrating on the advantages that they have over me simply on the services that are available to them from their telephone companies. You have heard from many people in regard to the 800 services, about just the variety. Here in Canada we basically have one type of 800 service. The design of the billing and everything is many years old, and the functionality is very difficult to work with.

(Steve O'Connor, Answer Plus, Toronto, Ontario, Volume 2-A March 13, 1991, page 484).

Some of the deficiencies that have hampered our ability right now to take advantage of the opportunities that exist, especially in the States, are user pay 900 interactive services, 800 lines that piggy-back on existing telephone lines, a limited choice of 800 services, also a limited choice of 800 numbers to support promotional acronyms such as Federal Express' 1-800 line that say "go Fed Ex" or "Call AVIS".

(Dan Plouffe, FIRSTEAM Marketing Inc., Toronto, Ontario March 14, 1991, page 707).

Technologies such as automatic number identification, integrated services digital network, virtual private networks and high speed switched digital services are not even offered in Canada. Medium and large business users in the U.S. have many options open to them which are not available to their Canadian counterparts. Such networks provide reduced administration effort, as well as better accounting of cost and feature support which can enable businesses to better manage their telecommunication costs. Detailed billings are very restricted in Canada in comparison to the U.S. Canadian customers do not receive call detail for services such as WATS, making it more difficult to control costs.

(Terry Holmes, Vice-President and Finance Manager, General Motors, Toronto, Ontario, Volume 3-A, March 14, 1991, pages 831-832).

Another example is the Official Travellers Guide to Canada. The guide will be distributed to U.S. travellers who are requesting information on Canadian destinations. Potential travellers call the 1-900 number which terminates in Columbus, Ohio. Ironic, isn't it? We are a Canadian company who could have easily handled the contract, however, we could not compete with the telecommunications offerings currently available.

(Susan Russell, Systems Manager, Check Ins Ltd., Halifax, Nova Scotia February 26, 1991, pages 197-198).

For example, services such as Virtual WATS, or Virtual Private Networks and Switched T1 are available in the U.S. and not available in Canada. Co-location on carrier premises of customer-owned equipment such as voice and data multiplexors is available in the U.S. and not permitted in Canada.

(Dr. Gordon Davidson, Director of Computing and Telecommunications, IBM Canada, Toronto, Ontario, March 14, 1991, pages 613-615).

Like many other companies, we saw that the high costs of long distance calling and low speed data circuits meant there was an opportunity to reduce expenses by renting fixed costs, high- speed bulk facilities and using them for both voice and data traffic.

I might add, by the way, that although we spent several millions in setting this up, and save many more millions as a result, we would seriously look at shutting the whole voice side of it down tomorrow, freeing up our technical resources to work on retail technology issues if we could get the same kind of savings and service that virtual private networks are offering in the United States today.

This is just one example of where Canadian carriers are lagging behind the U.S. in offering new value added services.

(Jim Lambert, Manager, Communications and Technical Services, Hudson's Bay Company, Toronto, Ontario, March 14, 1991, Volume 3-A, page 940).

3. Submissions on Regional Disparities

We are planning a new manufacturing plant in Western Canada and are concerned that access to our headquarters information resources will be extremely costly. A high priced telecommunications infrastructure acts as a disincentive for companies such as ours to decentralize and create jobs across this vast country. It would seem that an enlightened approach by the western provincial telephone companies to encourage the western migration of industry is needed. Competition in Western Canada is urgently required.

(Sam Sonnenschein, Pratt & Whitney Canada, Montreal, Quebec, March 11, pages 97-98).

Many of our customers in the larger centres – and I will cite one. Last week, for one day I was in Montreal. One customer there has a U.S. line in his office which is what? Seventy or eighty miles from the U.S. border. That system is not available, certainly, in Prince Edward Island. As a result of that, our competitor in Quebec can utilize 800 services in the United States which we cannot.

I think if we are to progress in the future in lines of marketing and marketing abilities, certainly we need a level playing field in having access to those other areas where we can tap into not only 800 numbers, but 900 numbers as well.

(Ray Keenan, Keenan Farms PEI Ltd., Charlottetown, P.E.I. February 25, 1991 page 120).

4. Miscellaneous Submissions

On telco costs:

I had the pleasure some years back of interviewing the then President of the Newfoundland Telephone...When I reflect on the opulence of the office he was in and his reported salary, which I heard about a couple of years later, up in the hundreds of thousands of dollars, I asked myself: can Newfoundland consumers afford that? Is that part of good telephone service? (p. 80) ...

My perception is that Newfoundland Telephone costs too much, in part because I think it is probably top-heavy with over-paid managers – in part. It is not the only reason. I also realize the expense it takes to bring service onto this island; there is no question. Our geographic limitations do provide amazing challenges.

(Ray Penton, Jr., The Dream Company, St. John's Newfoundland Feb 28, 1991, pp. 81.

On Universality:

Today, a researcher at the university can sit at his or her desk and within seconds using CANET [Canada's National Research Network] connect to a super computer at the University of Tokyo, search the catalogue of the library at the University of California, send electronic mail to a colleague in Australia, transmit a book for publication to North Carolina, transfer images to be prepared into slides to Dalhousie University, send a statistics' job to be processed at the University of New Brunswick, or search a CD RAM catalogue in our own university library.

In the next few years, that same researcher will want to receive full-motion video, the sound of an animal's beating heart, full text, electronic journals around the world, voice messages, images from video disks, and interact with colleagues in ways that we can't yet imagine.

Instantaneous access to a rich variety of information resources is rapidly becoming a critical asset to Canadian researchers. This will require a significant improvement to the communication services now available to them. (p 39-40) ...

Prince Edward Island is geographically located on the fringe of Canada. However, when an Islander can sit at his or her computer and reach colleagues, access databases, participate in electronic conferences, and be as up to date in his field as anyone in central Canada, his or her perspective changes. Instantly, Prince Edward Island is at the center of Canada with the world's information arrayed around him to use and to which he or she can contribute. (pp. 42-43) ...

Given a chance, our bright young minds can compete equally in the commerce of ideas which will be driven by low-cost computers and communications.

This is not just a Prince Edward Island problem; it is a national problem. We are moving toward a universal, all-pervasive communications network that will be at the heart of a global information-driven economy.

(Jim Hancock, University of Prince Edward Island, Charlottetown, PEI February 25, 1991, pp 44-45.)

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