AN ECONOMIC ANALYSIS OF COMPUTER COMMUNICATIONS SERVICES FOR THE MASS CONSUMER MARKET

Interim Report

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An Economic Analysis of Computer-Communications Services for Mass Consumer Markets

Revised Outline for Final Report

Chapter 1: Introduction

- Overview of computer-communication services
- Definition of interactive services

Chapter 2: Defining the Mass Market

- a review of alternative definitions/uses of the term mass market as applied to the field of computer communications services.
- delineation of the definition adopted in this study.

Chapter 3: Taxonomy of Service Offerings

- a review/annotated listing of selected services currently in place.
- a review of planned/foreseeable services.
- identification/discussion of alternative models of classification of services, such as one based on different technologies; one based on technical characteristics; one based on type of market served; one based on function provided; etc.
- selection of preferred classification model.
- classification of service offerings according to prefered model.
- analysis of classification, in particular with respect to the implications for mass market services.

Chapter 4: Demand Analysis

- a review of existing demand forecasts.
- discussion of demand determinants.
- establishment of a framework for analysis of demand determinants including discussion of alternative frameworks.

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Chapter 4: Demand Analysis cont'd

- analysis of demand determinants within framework established.
- comparative analysis of framework analysis and existing forecasts.

Chapter 5: Supply Determinants

- establishment of a taxonomy of producers, cross referenced with taxonomy of service offerings from Chapter 3.
- identification of supply determinants including discussion of market structure, role of carriers, competition, and role of government.
- analysis of supply determinants.
- examination of demand-supply interrelationships.

Chapter 6: Scenarios of Market Development

- identification of possible market development scenarios in the near to medium term, including implications of: alternative hardware developments; gateway facilities; new carrier options and/or different levels of carrier competition; foreign service providers/content; alternative market structures; alternative pricing structures for content, service provision, and communications; alternative hardware prices; and alternative marketing strategies.
- delineation of possible economic/social objectives.
- analysis of alternative market development scenarios relative to economic and social objectives assumed.

Chapter 7: Policy Implications

- review of existing policy.
- identification of possible policy concerns resulting from preceeding analysis.
- identification of possible policy actions based on policy concerns identified.

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Chapter 8: Conclusion

- based primarily on the analysis of Chapter 6, an assessment of the near to medium term development of mass market computer communications services likely to be experienced in Canada.

Notes on Interview with J. Schram of Bell Canada

It was noted that technology is a major factor driving the telephone companies or the communication market more generally towards competition at the present time. The question is no longer one of if versus when. It is also felt that over time computer communications services will fold into personal computer usage. Bell is currently offering or has been involved with three services that qualify as potential mass market services. These are: iNet, Vista and Envoy. Regarding iNet, the market trial has yet to come and until that time, there may be little that can be said as to the potential of the service. There is some surprise that many IPs reacted against the concept as they have. Small IPs do appear to be happy with the system. It is the larger IPs who have their own communications system or the capability for this who are the problem. The Envoy system is now tariffed to begin to appeal to the residential market. iNet is starting with the business market but downstream can be expected to begin to also serve residential users. It was noted that Bell does not have and will not receive a monopoly on this type of business. If iNet becomes universal enough then a quasi-monopoly could develop however. iNet on the other hand does allow more competition in database supply. It provides a point of entry for small IPs through picking up billing and such functions. Regarding control of IP entry, there is some concern with quality given that Bell is the marketing agent for the service. There is also some concern about duplication. In addition, universality of access could create cross-subsidy issues. If content is controlled, then the question is: does

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this violate the content carriage distinction that has traditionally been imposed on the company? In Bell's mind the answer to this is no. The telephone companies at the moment do have a technical constraint in terms of their capacity to handle large volumes of computer usage through the main switched network. They are moving towards ISDN and this will help considerably to remove the capacity constraint. The introduction of certain services can be expected to be paced in line with the digital conversion. If they are caught short, however, this would create short-term problems and could add impetus to bypass possibilities. It could also add impetus to the introduction of local measured service. In general flat rate local service is of concern. If average holding times go up, then usage costs rise considerably. But while more of the network is usage-sensitive, technology is also developing, for example, square switches, that might reduce the problem. This would mean, for example, having the same number of lines out as there are in. If major congestion does develop on the system, local measured service will become a greater certainty. Competition is also, of course, likely to push the market towards local measured service. The chances of a real capacity problem developing is far less for intercity traffic then for local. It is possible that pricing could be altered to distinguish voice from data.

It is not expected that Bell will maintain Vista. Bell does not see its own strength being in database creation and the decision to go with iNet was to some extent a decision to give up Vista.

Regarding cable companies as residential carriers, if

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services take off fast enough, cable will try to get into the market. If there is more time, the telephone companies will be in a better position to make sure that cable does not gain a major market share because more of the network will have been digitalized. Some service providers are likely to go the cable route regardless. The telephone companies have the advantage of presently being able to provide universal access. The telephone companies, however, may suffer if local rates rise since this will put them at a competitive disadvantage to the cable companies in terms of price. As personal computers become the standard terminal device and downloading becomes a standard service feature, the impact of local measured service will decline. By the same token the introduction of local measured service will accelerate the offering of downloading as a feature. The slow rate of transmission on telephone lines is a present problem. The digital system will overcome this, except in the local loops until the latter are converted. The local loop is definitely perceived to be the Achilles' heel for mass market development on the part of the telephone companies. ISDN will allow simultaneous voice data, etc., and hence will offer an additional advantage of not requiring users to install a second line.

(This was a preliminary interview only and will be followed up in more detail at a later time).

Notes on Interview with CNCP Telecommunications

CNCP currently is not targeted to the residential market. The perception of CNCP of mass market services is one which, if not exclusive to residential service, would necessarily involve servicing of residences. It was noted, however, that access to the residential market is becoming necessary for providing business market service which is the present primary audience of CNCP. The logic of this is simply that access must be where the individual is conducting his business. New service offerings such as message services coupled with the increased mobility or portability of computers is forcing the market in this direction as they see it. The inter-connect which CNCP already has in Bell territory and in British Columbia gives them this access in the major population centres of the country. They have also just reached an agreement for inter-connect with Edmonton telephones and anticipate that other such agreements will follow. If, however, this does not happen, the portion of the market represented by the present inter-connect rights which they have makes them believe that inter-connect will not be a major constraint on their ability to move into residential based services should they make that decision.

Regarding data networking, as the company now sees their services developing, they expect to go after an audience wishing to connect to third party data bases and to in effect

provide the carrier capability to allow that to happen. They do not anticipate packaging of their own services nor going the Bell route of user contracts direct with the carrier. This is the way in which Bell has currently packaged its iNet proposal. Billing on CNCP's system would be by the information provided not by CNCP. It is possible that they would provide storage on one of their machines for the data base of some IPs if this was requested but it would be a storage function only and would still not involve offering of packaged services. An index is something that they see might be necessary to provide. The above described service or network which is essentially a gateway facility is currently operational in technical terms but has not yet been marketed. No decisions have yet been made on charging for communication costs on the system. Cost of content will be definitely up to the IP. On the communication cost side they see the probable options as a choice between reverse charging and direct payment by the user. In the long term it is felt that predominant access to telecommunications facilities from office locations will become less reliant on the telephone companies but that this will not be true for the residential market. There is thus a continuing concern, and perhaps for some future applications growing concern, regarding potential changes in local pricing and the structure of local rates on the part of the telephone companies. There is a concern about

access on an equitable basis and a concern that Bell or other operating companies not bundle communication charges with other costs in packaged service offerings. If the telephone companies attempt to raise significantly the price of local service or if for whatever reason that price rises, this could in the short run constrain market development of the type of services we are discussing. In the longer term however, they see this promoting various options which are technically possible at the moment, the most notable of these being the use of cellular radio and the use of cable. Given present price configurations they feel there is no question that the telephone companies will beat out cable as far as this market is concerned. One of the difficulties with cellular radio is that unless there is both a receiver and a transmitter attached to the phone that inter-connect will still be a requirement. Cable is of course contrained at the moment because it is not a two-way system. Provisioning a limited bandwidth return system would be the most economic way of providing two-way cable but problems in response time on such a system were noted. Should both cable and telephone companies become competitors at the local distribution level CNCP's position would be one of support. They would anticipate providing inter-connect facilities with both. It was noted that quite apart from technical factors the telephone companies have more capital at their disposal than the cable companies and are thus better positioned to go after the market than the cable

companies. There is, however, in this the potential to national carriers such as CNCP to provide alternative systems to that of the telephone companies. This they would welcome. Should the cable companies attempt to use the cable network and in conjunction with, for example, satellite transmission to provide yet another national network alternative, there would be far less enthusiasm. They noted, however, that it is their general position that competition should be encouraged and as such they would live within the rules and not oppose such a development.

Returning to the Bell iNet proposal, CNCP does not intend to exercise any control over IP access for any system which they themselves may operate. This is contrary to the model which Bell has chosen of a package service where almost necessarily there must be some level of screening. Should Bell's selective signing of IPs make those IPs unavailable to CNCP service then CNCP sees the possibility of having to change its present policy position. They would in principal strongly object to any attempt on the part of Bell to establishing exclusive contract arrangements with IPs.

Regarding messaging service. There are three general categories presently offered by CNCP:

1. Telegram and Telepost;
2. Transmission for Private systems and;

3. Network Services, of which there are three, namely Telex, Telenet (which is a store and forward message service) and Infotext which comes in different versions but essentially is an electronic mail box service.

At the present virtually all electronic mail type services excluding telex are intra-firm business. There is as yet no directory that has been made available so that this intra-firm characteristic may be a temporary phenomena which will not be as dominant in the longer run. At present there is no ability for CNCP's electronic mail services to interface with those of Telecom Canada or more specifically the Envoy service. There are also no plans to provide or ask for such an interface at the moment.

Notes on Interview with Rogers Cablesystems Limited

In the non-programming services area Rogers have been relatively aggressive up until approximately one year ago. This is now changed. A number of U.S. market tests operated through U.S. subsidiaries met with only limited success. The judgement is that it was too much too soon.

In Canada, Rogers, in installing equipment for Pay-TV, put in addressable technology. This has immediate benefits in that it allows people to order the movie of their choice and facilitates cut-offs and the searching of services from the plant. Its major virtue, however, is a long one and indicates that Rogers still intends to move into services which will require addressable technology in the future. Previously games had been seen as the entree to two-way service. There is more uncertainty about this now. Security or monitoring services are now rated as more important in this respect.

CRTC has said that it will not consider non-programming services until 1985. Rogers therefore will not invest in the plant required until then because of the uncertainty due to regulation. This more than any other market uncertainty may be one of the major reasons for the hold-up.

There is a two way systems being operated by a Rogers subsidiary in Portland, Oregon. The biggest problem exper-

ienced there has been convincing people to use the TV set for a service that offers a hundred and two channel capacity with multiple type offerings. To date all of the hundred and two channels except thirty are being used by Rogers. The original approach was to offer a menu which did not, however, work because it was so expensive that people couldn't make choices. They have now gone to a package concept where there is a basic subscription fee which provides access to a core service for which there is unlimited usage. One then buys other packages as desired on an add-on basis. The home market is felt to be a subscription market. The user pay market is perceived as being more business oriented. The user pay residential market is likely to be a pay-per-event. It is possible that it will involve the use of the system for transaction services such as banking and shopping. The future of transaction services in general is not felt to be all that great. At the moment there are more business applications for the technology than residential. This is felt to be a disadvantage for the cable companies because their level of penetration of the business market is so low. This is simply a hardware phenomena in the first instance in that they have not wired office buildings historically. The remedy for this problem is essentially a financial one, however,

since most of the office buildings in question are passed with the cable companies lines at the moment. A mass market, in Rogers opinion, would be defined in terms of volume of business not type of customer. In others words it would not be exclusive to the residential market, though the latter would clearly be a part of that. In a sense the mass market is felt to no longer exist. The technology is highly suited to segmentation. From a merchandising perspective this enhances trends already in evidence in other sectors of the economy. To attempt to aggregate the computer communications market into some large homogenous entity would be a regressive step it is felt. Even conventional TV, it is felt, will cease to be a mass market in the form that it has been. People increasingly are becoming selective in the type of television that they will buy, i.e. new channels, sports channels, religious channels, etc. The fact that cable technology provides the possibility of a hundred and two channel capability has permitted this to take place. The technology and the licensing procedures favours one carrier for a hundred and two channels rather than a hundred and two carriers or system operators. There are economies in terms of hardware if there is just one or a few operators. Packaging of various channel combinations is an impossibility if there are too many operators. A

number of marginal services wouldn't be able to make it if they had to operate on a stand alone basis.

Cable companies will probably take part of the telephone company market in new service areas, particularly those areas which complement the cable companies' traditional service areas. Beyond that it will be a question of price competition between the two. The cable companies thus are expecting to provide a distribution service for computer based services either because the telephone companies can't or because they want too much to do it. A conversion of cable to two-way is relatively easy compared to the elimination of the telephone company's problem of capacity constraint in the existing network. The latter will only be removed with the full introduction of digital switching and perhaps fibre-optic lines. This will be much more expensive to accomplish than will be the conversion of the cable plant to two-way. Existing technology for two-way conversion is felt to be more than adequate for the service in question.

Videotex and Teletext are seen as add-ons for users who will enter the system in the first place for functions such as security or monitoring services. The role of the cable company is seen as that of carrier and marketing

agent, i.e. sales agent, rather than as content provider. The companies feel they can live with a content carriage separation but they would like to be able to fill "voids" if possible. The real problem is whether others could get fair equal treatment without content carriage separation. The answer is felt to lie in allowing this only through an arms length subsidiary.

Control of content is a different issue. It is felt that there is a responsibility as retailer to exercise some control for quality purposes and also with respect to packaging. Revenue sharing arrangements are also the preferred charging system with IPs.

Further down the road the development of gateway facilities is seen as possible. These systems would most likely operate on a straight lease, user pay type of system as far as the producer was concerned. Also in the future it is expected that there will be more attention paid to providing interface with personal computer and other terminal equipment versus TV sets.

TV oriented uses, however, will remain or are expected to remain the mainstay for the cable market. There is a need for more standardization in the industry. A

real problem is created at the moment due to the incompatibility of various types of terminal equipment with the main data base.

Foreign content issues are not perceived to be that important. In general it is felt that there are existing interest groups to safeguard against most of the adverse effects which are talked about. What is an issue is that of privacy. The system will generate a lot of information on users. This is particularly important when there is foreign ownership. In general decisions will have to be made on what can be kept, what can be sold and what can be used with respect to this user profile that will be amassed.

From the Portland Oregon trial certain lessons have been learned. Consumers want something that is real in value terms, simple in operation and straightforward as to packaging, price, etc. Two large a menu selection was seen as unacceptable based on real experience. There was a definite preference for subscription-based, discreetly packaged items. Security services in the form of fire and burgler alarms and other emergency warnings was or has been a major attraction of the system. The cable company, with respect to these services, is purely a passive carrier, in other words a private third party

does the monitoring. The cable eliminates the need for a direct wire dedicated to such services however.

Notes on Interview with NABU - A. Chitnis

October 25 NABU officially launched the NABU network in Ottawa. This is a database system offering news, family entertainment, educational programming and general entertainment information. It consists of a headend computer, a signal put over a cable channel in broadcast mode and a home terminal which is a personal computer. The system operates with a teletext type transmission coupled with the local processing capability of the home terminal. In other words, programmes are downloaded into the local unit and manipulated from there. Downloading to the intelligent micro gives the consumer or user a greater capability. It reduces the communication costs and the port requirements and it means that there is no traffic congestion because transmission is in broadcast mode. This system permits both keyword and tree search techniques. The menu is of a videotex type page format, etc., but the files themselves are not. The computer itself is a fully usable computer that can take all regular peripherals including telephone modems though most of these peripherals including the modem are not yet available.

To get some idea of the dimension of the market, at the beginning of 1983 the personal computer market in terms of sales was 1 billion dollars. Video games were 1.4 billion, arcade games 7.5 billion and software 1.9 billion. From 1982 to 1985 it is expected that video game hardware will flatten out while software will expand. Computer hardware is expected to grow quite a bit while computer software will grow very considerably.

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By 1985 for the North American market as a whole it is expected that 70% of homes will be passed by cable. 50% will have cable. The Canadian averages are already as high or higher then these numbers.

NABU has compiled a profile of what they expect their typical user to be. The characteristics are: above average income, a family with children between the ages of six and seventeen, people who regard video games as too limited, who regard a personal computer as too complicated and for whom purchased software and accessories would be too expensive. The personal computer rather than a videotex terminal is seen as the entry vehicle to the home for both data service and transactions services. In part, this is why NABU has chosen to use a personal computer as their terminal device. The major reason of course is because of the mode in which they are transmitting the database and the downloading characteristic which this requires.

Services in the electronic computer field have been grouped in the following way:

1. Data Services
   - data presentation: retrieval of passive information such as news and weather. This is the main thrust of videotex in NABU's opinion.
   - data manipulation: active processing. This involves games, education uses, etc. This is regarded by NABU as the main thrust of personal computers.
   - data transactions: interactive transactions services such as reservations, messaging and shopping. This is

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regarded as the secondary thrust of videotex and teletext.

2. Synchronous Communications
   - telephony
   - teleconferencing
3. Telemetry Services
   - alarms
   - meter reading
   - other monitoring services
4. TV-related Services
   - pay TV
5. CATV Operator Services
   - on-line
   - off-line

Videotex is seen as a time-sharing system that differs from most in: 1. the ease of log-on procedures; 2. the color graphics and key pad operation; 3. its orientation to the consumer home market. A major problem with videotex is preceived to be its limited capacity. A single VAX 11 might support five hundred people if they are only undertaking simple information retrieval but if they are playing games it might accommodate only fifty users.

NABU service, at the moment, is one way. This is phase one. Subsequently phase two will expand the system to provide 1.5 way service, by virture of attaching a telephone modem to the terminal to provide access to third party computers. Phase 3 will provide 1.9 way service, as described by NABU. At this point the user will be able to interact not just with third

party computers but with the main NABU computer using a phone link to order specific items which will then be included in the broadcast transmission. At present non-NABU computers cannot be connected to the NABU network. This means that the NABU machine is dedicated to the NABU service. There are adapters available but they are not being marketed at the present time. It was claimed that this was due to concerns over warranty problems and such matters. In fact it is probably a deliberate marketing strategy. It was noted that they do expect at some point to enter the inter-connect market but that they are for now attempting to provide end-to-end service including all hardware. They have not ruled out the possibility of entering the stand-alone personal computer market with their machine. The computer sells at the moment for $695. If the volume of sales can be increased sufficiently, economies of scale in manufacturing could bring the price down. It is hoped that the price will be below $500 within the next twelve to eighteen months. If the price is low enough it is hoped that people may be willing to buy more than one machine. The drawing force for the network is seen as being the entertainment section coupled with educational uses and on a more limited basis, current information. Pricing for the service is $19.95 per month for the machine with a three year lease arrangement and, for the service itself, the basic family unit, which must be purchased before any other items, costs $9.95 per month. There are two other packages creating a tier-type system, albeit horizontally, beyond the basic family unit. The LOGO unit sells for $4.95 per month as does the games unit. The service when introduced had

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a special introductory offer good for the first two months, i.e. to December 31, 1983, of $49.95 for the first two months for the entire package. The computer can be purchased for the price of $695. People who begin by renting and subsequently decide to purchase can expect to get some rebate on their rental payments. The machine itself is CPM compatable and can use all CPM programs in a stand-alone mode with disc drive. The machine uses the MSX standard which is the same standard that has been agreed to by 14 Japanese manufacturers. It does not at present incorporate the NAPLS standard which is regarded as basically a data presentation standard. The NAPLS standard can, however, be added either through the use of a decoder card which would be optional or through down-loading the necessary software to the computer. For the present, cost is seen as the reason for not building in this capability. A usage-sensitive pricing scheme is rejected for two reasons. First, because the broadcast mode does not lend itself to time sensitive or item sensitive pricing, at least not until they have reached phase three. Second, it is felt that usage sensitive pricing discourages experimentation by users. Once phase three is reached with its 1.9 way capability it will be possible to add a pay as you go feature. Even in the long run, however, it is expected a large base of subscription items will be required to build and to maintain the market.

The broadcast and cable distribution system was chosen over telephony because of a number of factors. These are:

1. They wanted a short response time. Videotex is quick only on

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a "good" day and the speed which is normally quoted for videotex relates to the response time of the computer rather than the page generation time which is required. When telephone transmission lines are used this page generation time is unacceptably long in NABU's opinion. This would be particularly important given the downloading feature which NABU has built into its system.

2. The cable industry is perceived as a better partner than the telephone company. The telephone companies have typically not been that aggressive in marketing and do not have that positive an attitude towards firms such as NABU. It was noted that to a large extent the relationship of many firms in the field with the telephone company has been a parasitic one and that in turn this has generated a similiar or a negative attitude on the part of the telephone company towards such firms.

3. The cable company was able to offer a billing capability so that there was no disadvantage compared to the telephone company in this regard.

4. In the long run the cable broadcast system will permit the elimination of the need for a computer at each local cable station. Distribution will be possible by coaxial cable, satellite, or microwave so that there will be no traffic problems or extra machine costs. In principle they could lease a satellite channel and serve the entire country, arranging the transmission by cycles for different regions to provide local content.

5. The telephone company will be at a disadvantage so long as the present ratio of lines-in to lines-out is maintained. In the long run, it is not expected that this is going to change and

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that, therefore, there would be a continuing traffic problem with the telephone companies.

There is a considerable worry about U.S. services in the sense that they can supply Canada with little marginal effort while the reverse is not true. NABU is beginning to try to market its system in the United States, however; it feels that it is a strong system and that it can compete. In terms of content there is not a particular concern regarding foreign content. It is noted that at present the content on a NABU system is mostly Canadian. It is also felt, however, that if U.S. content develops which is better known and if, pragmatically, subscribers want such content, then they will provide it. It is seen essentially as a business economic decision. If the government wishes to pursue a Canadian content objective then it is felt that the government should offer tax incentives for consumers who buy or lease Canadian produced hardware and software.

Interview with INFOMART

The discussion began with consideration of the meaning of mass market. It was noted that relevant markets will vary with the supplier. For Southam and Torstar the relevant market is a newspaper market, i.e. the market of newspaper readers. Mass market is felt to be an idea. For the moment at least the strategy is to pick off a piece of that market, to package and select content to suit a particular market segment. It was felt that to be relevant, mass market must be defined in terms of the number of subscribers to a service rather than number of customers of a service provider. By building on a targeted market approach it is possible over time to envisage these parts being combined in some fashion to ultimately establish a more conventional idea of a mass market.

The ultimate mandate of Infomart is to be number one in the electronic publishing field in Canada which means for their purposes to have an electronic offering available for everyone buying a newspaper. Personal computer users or owners, in themselves, will not constitute a mass audience. By virtue of the PC ownership alone, personal computer users are regareded as a very heterogeneous group and don't represent a target audience as per the above. There are no perceived advantages of putting common database elements or putting all database elements in one pot versus packaging separate pots. If one is going to target the audience correctly the question of unique design of the database is also important.

Regarding cost elements, there is first the cost of the hardware in the home. This is made up of a display unit, a decoder, a communication box and a keyboard or keypad. Second, there is the cost of the telephone connection. This may be free in the case of a service which is local dial-up. It may involve cost when there is long distance involved. There are different

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ways in which this may be handled such as, for example, a flat rate per minute design such as is being used for Grassroots. This type of charging system does not discriminate between users according to how far they live from the computer centre or the nearest point of access to the data route. There is a concern that because the telephone companies are concerned that computer users and service bureaus will get a free ride as long as local service continues to be priced on a flat rate monthly basis, this will promote or add support to the call for measured local service to be introduced. Third, there is the subscription costs for basic service and fourth there would be the subscription or other charges for add-on services.

It is felt that consumers will not want variable price structures, thus it is expected that there will be a basic service for which consumers will pay a fixed charge and enjoy unlimited usage. It is not clear what evidence supports this view of consumer preferences but it is a very strongly held conviction.

Beyond some basic service, however, it is anticipated that there will be add-on packages which will involve add-on costs. Thus a kind of tier system, albeit of a horizontal fashion, beyond the basic service will be introduced.

Going back to hardware costs it is expected that people may want a dedicated display unit, in other words they may not be content for various reasons to use their existing TV set particularly where there is only one TV in the home. Insofar as a preference for a dedicated display unit becomes a dominate characteristic, this will help push the market toward the personal computer as the basic terminal unit and the development of appropriate videotex software to go with this. In the mean time the TV is expected to be used in order to diminish the start-up cost.

Some people, it is also felt, may want a second phone line. This will

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be a function both of how much they use the videotex system and how much they use their phone for other purposes. Certain forms of content for example, games, could influence this decision. In the long run it is acknowledged that dedicated terminals will not be acceptable. In the short run, however, it is perceived that this will help to lock customers in. One virtue of a specific decoder is that many people are still afraid of computers. The "user friendly" mentality will become less relevant as the next generation becomes more computer literate. Systems operators will have to be flexible in this regard, updating hardware, software and communications.

There is a strong belief in maintaining the content-carriage separation which has held for the telephone companies up to now. There is a fear of carrier monopoly both in economic terms but also from a social perspective because of the implications for invasion of privacy etc. Allowing private operators to lease relevant equipment from the telephone companies and operate their own service, if the use of the system can be obtained at cost, will in fact reduce prices significantly. For example, Infomart at the moment on Teleguide has bought or leased lines from Bell Canada. It has then put in its own front end equipment and concentrators along the way and ended up with a system which services one thousand terminals from seven leased lines at a cost of one million dollars versus the Bell price if this service were bought directly from Bell of ten million dollars. If the telephone companies are allowed into content then over time there is a considerable chance that they will become dominate. They understand the communications market and coupled with their position as carrier will be in a position to dominate the field. There is a distinction between a utility which should not be allowed in content and a system operator who is then responsible for selection of content, targeting of audience, etc.

The adoption of the NAPLS standard will help the industry considerably and

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will begin to promote technological convergence on the hardware side. That in turn will mark the beginning of a convergence of markets or at least of market participants. There is a place for graphics in systems of the kind under discussion so that a simple ASCII mode in itself will not be sufficient for certain applications. Logos, for example, will be very important for advertising. At the moment ninety percent of the dollars going into the industry come from IPs in the form of advertising. In the long run carrier operated gateways may be a good concept but care must be taken in how this concept is introduced. In general, however, the notion of one entry point, one bill, etc., offers potentially a number of economies which would not otherwise be realizable. The system operator as an intermediary could become more prominent in such a system but could also become less prominent. Essentially it means that users would have the option of accessing services direct or through intermediaries and unless constrained by prices or other constraints would be able to move between services with far greater flexibility. This could have implications for the price structure which is adopted. There is an inverse relationship between flexibility on the part of users to obtain their services where they want and tied subscription pricing. If carrier gateways should become the only means of entry into the system, then service providers would essentially become umbrella IPs. In such a case the content carriage seperation would become blurred. The concern here is not over precluding gateway facilities but in insuring that if they come they are managed properly under very carefully and well defined rules of management. Privacy is seen as a real concern which the industry is going to have to selfregulate in an appropriate fashion. Alternatively government will regulate the industry. There is a great incentive therefore for the industry to do the job well.

Hardware costs are recognized as an impediment to market expansion at the present time while in the long run the NAPLS standard will be of major benefit. In the short run it set back the hardware industry by approximately

two years because of the necessity to redesign equipment, etc., to incorporate the new standard.

Regarding the residential market, business is regarded as being more price sensitive and usage sensitive than the home market. Consumers will want a fixed subscription pricing structure for at least basic entry and basic service. A tier system could accommodate this while still providing some flexibility in pricing and packaging of products. The type of content on a system for residences versus business will include more entertainment type packages such as games, Dear Abby and the like. There will not be as much specialized professional services. In the longer run it is expected that there will be a convergence in terms of databases available and the location of access.

Communication costs are also recognized as an impediment at the present time. Grassroots has adopted a system of five cents per minute regardless of where the user resides. This might not be a workable system with a different geographic configuration of users. Transaction services are felt to be the key to consumer entry to the market. If the savings and attractiveness of transactions services via videotex are great enough then cost of communication and other impediments will become less of a constraint.

Regarding cable operators, one of their problems is they seem to be cash poor. They are at present a one way system and it will cost a considerable amount of money to change this. It is felt that insofar as cable operators are looking at teletext services that is merely dabbling to get their foot in the door, that ultimately they will go to two-way service.

Teletext is regarded as fine for down-loading of software or for pure information but it cannot do all the things that two-way can do, whereas the reverse is not true, i.e. two-way can do anything that one-way can. British experience is at odds with this since teletext service has been far

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more successful in the U.K. than the Prestel service. This is felt, however, to be largely due to the Prestel marketing strategy in the early years where there was a universal database which offered breadth rather than depth and there was also a "pay as you play" stratagem which simply does not work.

On the issue of foreign competition, foreign service providers are seen as competition in direct delivery terms. This has implications for Canadian service providers. Right now Canada has approximately a two year head start in experience. This is then a leading edge at the moment which, however, they will lose if expenditures are not maintained at a level necessary to keep ahead. Developments such as iNet makes direct access by foreign services more likely and or easier. There might be a need for content rules if Canadian service operators provide U.S. services even if direct access is controlled or fails to develop for some reason. Again to forestall government regulation in this area may require industry to be self-policing. The major problem, however, is felt to be a direct access problem.

Notes on Interview with David Carlyle

The notion of a mass market was defined as anything over five percent of a given market. This was noted as being the conventional advertising definition. Beyond five percent you simply then measure penetration rates rather than "noses". Videotex service is seen as one potential mass market. Teletext would be another potential mass market. Both use the same decoder but one also adds the use of a telephone modem.

Videotex is distinguished or characterized by its organization into pages and the delivery of those pages one at a time. One does not search on Videotex system or at least the advantage of a Videotex system in terms of price lies in not providing conventional search capabilities. This makes the price very low. One gets one page at a time not multiples. The theory of Videotex is that if you can take advantage of these limitations you can get major gains in efficiency and in cost. For consumers the advantage is that it is a simple system that can be easily understood. For information providers the advantage is that it is the only technology which allows true decentralization as well as simplicity. Videotex can be used as a gateway in order to access more sophisticated systems. The Videotex market has not developed as fast as expected because a "valid product" has still not emerged. People ultimately will need a reason to buy the system. In the United States there are seventeen operators presently

in the field and twenty more are expected to be announced by the end of 1984. The field thus is beginning to take off.

Two and a half years of standstill because of NAPLS has slowed things down considerably. In 1981 decoders were selling for $500. They are now $1200 because of the new standard and because equipment manufacturers had to go back to the drawing board to upgrade their equipment. This phase has now ended, however, and sales will again begin to rise as prices start to fall.

JC Penny is spending one hundred million dollars to develop a service in Denver. This was noted as an example of the future which Videotex has. Reuters is a good example of an information product that has succeeded and is evidenced in the success of Reuter's public issue in the amount of one billion dollars. Dow Jones is going to turn itself into a Videotex service as are Compuserve and The Source. Communication costs are seen as a major factor influencing the market. National service cannot compete directly with local services. They either have to become local themselves or set themselves up as a gateway or become a wholesale operation. Dow Jones is an example of this. Dow Jones tried to sell against Viewtron in Miami, charging seventy-five dollars for its service. Viewtron customers were paying something like

fifteen dollars. Dow Jones ultimately gave in and began to offer Viewtron customers the Dow Jones service for a marginal charge of ten dollars. There are some who speculate that ultimately Dow Jones will have an add on charge of no more than one dollar.

Other factors limiting direct sales by IPs or by national services is users' habits. The entry of a single IP is made difficult and there is the question or desirability of local content for things such as transactions services which gives the local service provider a major advantage. The local operator ultimately will have the subscribers and will be a gateway to hundreds of IPs many of whom will be national IPs. There will be competition at the local level. The industry does not constitute a natural monopoly. The entry costs are relatively low. For one hundred thousand dollars one can acquire a computer with thirty-two ports. If nothing is done to stop it U.S. firms can be expected to establish Canadian subsidiaries or to market on a wholesale basis their services directly in Canada. This will mean that educational content will be U.S., shopping content will be U.S., transactions content will be U.S. and news content will be U.S. Each of these has major negative implications. Government seemingly has not appreciated the significance of this and it is feared that it will not until it is too late.

The ultimate market potential of Videotex is felt to be 98% of all households. The people who say that the home or residential market is not there are engaging in "gratuitous speculation". Once the product is there the market will also be there. The 98% figure will be achieved with a price in the range of fifteen to twenty dollars per month. At the moment there is a relatively large sensitivity to price. But this is in part a function of the newness of the service and as well the still relatively limited capability of the service. Viewtron for example, has only twenty thousand pages at the present time. Ultimately, to be a viable service in the long run it will require closer to two million pages. However, they have to start somewhere. Once the service is improved the price sensitivity will be less.

The monolithic concept is "garbage". It is like saying you are going to have one book or one library. A major problem that has plagued market development to date has been the lack of a standard. There has been no graphics standard up to now to compare with the ASCII standard for alphanumeric characters. NAPLS is now that standard; even IBM has now signed off on it.

The universal access concept is a practical impossibility. A data base can't be used unless someone makes it useful. The

notion of everyone feeding in and everyone taking out simply will not work.

Whether the decoder comes in the form of software in a personal computer or a set top device as a dedicated piece of equipment doesn't matter so long as the standard is the same. In the future downloading will become more common. Magazines and advertising driven material will not be discouraged by downloading. The people selling hard information and programs will be concerned. Basic content for business service and for residential service is very close. 99% of the content is, in theory, transferable. It is the packaging which is the major difference coupled perhaps with the fact business often requires higher speed and higher resolution than consumers.

On the question of telephone companies versus cable, in the long run it will be a matter of economics. The telephone companies have some real advantages. Bell for example now has a digital capability for 45% of Toronto. Full digital systems are not that far away. The telephone companies have the money required for the investment. They have the incentive to make the investment and they have and understand the technology which is involved. There is no two-way cable at the moment which can do interactive service properly. The only two way capability now in common use is in effect a

polling type system with a twelve second leg in response time. Carriers should not be allowed in the content area (i.e. the traditional content carriage separation for telephone companies should be maintained in this new field, except for the case of arms length subsidiaries.) There is too much potential for unfair practices by carriers who are also putting up their own content. Carrier gateways are okay if they do not go too far. iNet is perceived to go too far. It is not clear why anyone should want to use iNet at the extra cost involved if they can dial direct. What is not clear is whether the telephone companies want to allow direct dialing. iNet in itself does not overcome the compatibility problem. The system needs a pattern recognition software which does not now exist. When applications involve messaging then that becomes content and should not be permitted.

On the privacy issue people are very worried. Results from various field trials especially the Times-Mirror trial in San Diego shows that it is a major concern. Interestingly, people trust the companies more than government. It is not clear whether this is a unique U.S. characteristic. System operators assemble the audience and provide the service. In order to do these things effectively it is necessary to provide content and control content. Content can be ob-

tained in any number of ways. This is essentially a question of economics. A lot of information a subscriber simply will not pay for. It will be necessary for this to be advertiser financed. It also implies that universal IP access may not be a viable concept for this reason alone since universal IP access will require subscribers to pay for information itself. The preferred price structure is felt to be one of sponsored content, advertiser financing, coupled with a small flat rate subscription fee to handle administration costs, with some upper limit on the total that can be charged. A tier system is not perceived to be appropriate if it is a vertical tier system. Differential fees for defined bundles does make sense. The Times-Mirror trial tested usage sensitive pricing versus fixed subscription pricing and found the latter to be far more acceptable. The actual sale of information is decades off, in general. There are some exceptions which are already in evidence such as stock exchange services but this is a relatively small part of the total and will continue to be for some time. There is a trend for more downloading to be permitted and coupled with this to provide more capability for data manipulation at the user end. In effect this will push the market towards some form of personal computer as the basic terminal device. Many people argue that users do not need graphics and color. This may in fact be true. The point is, from a marketing stance, it is the IP who needs it because the

graphics and color will permit more effective selling.

Photo imagery technology is not likely to cut the page costs greatly. It will provide higher resolution and better color than graphics that are now available but may not prove superior in economic terms. New services will represent a strong new competition for advertising dollars with traditional delivery systems such as newspapers, magazines, etc. There will be a lot of disruption in the market as a consequence.

Ultimately success of the service will depend on four factors: convenience, time, money and confidence. Ten stages were identified with regard to the mounting of a successful service. These are: a) audience acceptance; b) information provider acceptance; c) key content acquisition; d) page creation equipment; e) applications software; f) host system software; g) host computer equipment; h) front end processor; i) communications network; j) user terminal equipment.

A grouping of IPs identifies the following: 1. banking; 2. shopping; 3. news; 4. education; 5. games; 6. messaging; 7. classified; 8. programmes; 9. entertainment guides; 10. consumer information.

The system operators assemble an audience of users to link those users with the IPs in these ten categories. The result is "an information product".

Notes on Interview with Ian Sharpe

Telidon is not regarded as being a particularly viable system. It was described as "only pretty pictures". A key-board hooked to a TV is not a new concept and in the long run is not likely to be a satisfactory type of system.

Sharpe has just initiated a new system in Europe involving the distribution of information in airports. It is a video distribution that drives TV video monitors. It involves ten thousand pages of information and the system can drive eighteen hundred terminals/monitors at one time. The incremental cost of an additional terminal is only one hundred dollars. It provides for automatic update of the information. This system is expected to be expanded over time to carry maintenance manuals for aircrafts. Monitors will then be put into hangers and information will be updated directly from the airplane manufacturers. Also monitors are expected to be sold to hotels as well as cab companies and businesses. The charge per year for a monitor at the moment is $2,000 U.S. Basically this system involves a marriage of video display technology with a time sharing network. Another Sharpe system which is in operation which is analogous to this involves a real time feed from all stock exchanges around the world. Both of these are one way systems. They are not Telidon or Videotex systems and they are felt to

be far superior so far as Sharpe is concerned.

The notion of everything being in one huge monolithic input-output unit is perceived as ludicrous. There is no mass market for everything on one system. The more you combine the more complicated necessarily the system must become or else the less functional it must become. It is felt that there is a mass market for advertisers and here Telidon may have a role to play. Advertising is defined in this context as any situation where the owner of the information pays to distribute it. This would include all sponsored content. It is also felt that in some cases users might be prepared to pay for some of this. Information itself rather than a given technology or service is felt to have more mass market potential. Most individuals want information rather than a particular means of delivery. Regarding personal computers it is felt that to some extent that market at the moment is working the wrong way around or rather that people entering the market are attempting to operate it the wrong way around. What this means is that the machines are being sold and then attempts are being made to find uses rather than uses being created which in turn will help sell the machines. As an analogy it was noted that color TVs were not sold before color broadcasts were available.

An important distinction was made between personal computers and home computers. The latter was seen as the rough equivalent of a games machine. In general the difference between the two is one of price and capability. Ninety percent of home computer sales to date it is felt have been primarily for playing games. This is a legitimate defined function for the computer in the home but on-line services still require a personal computer. Over time the equivalent of a personal computer will be able to be purchased for the present price of so called home computers. But whether people will move to more sophisticated machines even at the same cost will depend on the services being available. It is the applications which drive all computer based markets. Within certain limits the market place over time may converge. These limits will be based on syntax built into the service. Necessarily some services will require a more complicated syntax than others. There is a question as to whether one syntax will work for a particular need and a question of whether people will know how to operate a particular syntax. There are so many applications, so many things that can be done or that people will want to do that an all embracing syntax will be too complex. Throwing out, for example, the syntax of the telephone set, makes no sense even though the computer

can be made to do it. There will still be a need for a simple telephone set for voice message service. On the equipment side it is not seen as necessary nor necessarily desirable for a convergence to occur. The duplication of input/output devices such as for example on instrument panels is not new and may exist for very good reasons. It may be more efficient to have dedicated units to do certain things than to have an all embracing unit which attempts to do everything.

In general Sharpe dispenses information and sees itself as a provider of software to allow customers to use that information rather than of the information itself. They do not see getting into the wire service business where it is the content, i.e. information, which is the paramount ingredient. Sharpe does do raw data compilation at the present time. The unique offering of Sharpe is in the formating, storage, distribution and manipulation capability built in to the data which it provides from other sources.

Two final comments were made. One, it was repeated that Telidon Videotex will be essentially by-passed by the market. Although it has its uses as an advertising

medium it is not a service that people will ultimately buy in sufficient numbers to justify its existence. And two, polling/voting uses of home systems should not be permitted. Instant uninformed reaction is perceived as tremendously dangerous and intrinsically evil.

Notes on Interview with Michael Fox, Financial Post

Financial Post has to a large extent been on the side lines up to now with respect to electronic data base services. This is with respect especially to new product development. More attention is now beginning to be focused on this. Up to now the feeling has been that there are many others getting into the field and it was better to wait longer in order to learn from their mistakes. They have gone into some areas, those which are natural extensions of the printed products which Financial Post already produces. Very little of this has been marketed as on-line service. For the most part it has been sold in the form of tapes or via other vendors. There are elements of electronic publishing which have been identified. These are:

1. The creation of information;
2. The hardware components;
3. The physical apparatus for delivery of the information and;
4. Marketing.

The first three are either in place or available. The latter has not yet been done to any major extent. Some experiments have been conducted. There is a data base offered through QL Systems as a trial and Financial Post was one of the participants in the iNet trial offering the Financial Post 500 on iNet using telidon page format.

Financial Post has recognized a need for micro-based

products, that is to say data that can be run on micro. According they have launched "micro-post" which provides a floppy disc each month containing corporate information on one hundred and fifty companies plus the software to analyze the data. Eventually it is expected that this service will tie into service accessing a centralized data base. The major difference between on-line and the disc type format now being used is one of communication charges. It is felt that the latter is the major impediment to on-line for the type of data that Financial Post is providing. In the future it is expected that it could be preferable to continue to provide the disc for the primary data and then to provide updating through on-line service.

Basically the Financial Post is targeting the business/ investor audience. They are not seriously looking at private individuals nor at the residential market at the present time. Approximately one year ago they began to compile tapes for an electronic library of the Financial Post newspaper. For now this is available only in archival form. It is possible though not contemplated that at some future time there may be an electronic delivery of the current issue. In general, print publications are seen as having a viable future. They do not expect to see electronic media supplant print media. In general the cost of delivery including

the hardware at the user end will be a prime determinent of how the electronic market develops. Videotex Telidon is generally perceived to be too slow. High resolution graphics are a major part of this and are felt to be unnecessary for much of the information and most of the audience that the Financial Post is going after. Although the cost of putting up electronic data bases is falling the connect time cost is still relatively high and there are very few who can afford it on a regular basis. People are willing to pay for information based on need, i.e., expected benefit. Browsing is not that likely in a system with connect time charges. If and when a mass market develops then more in the electronic field could become viable through economies of scale. In this case there may be more interest in providing service that would be aimed at the residential market. There is a problem at the moment with different systems using different syntax, etc. The gateway system in theory could solve this problem but gateways have yet to be introduced on a full commercial basis. For the moment newsprint continues to be the cheapest form of delivery for the Financial Post newspaper.

Daily newspapers are more suited to the electronic medium than weekly newspapers such as the Financial Post.

In the future if the following trends continue then there will be a acceleration of market development. These trends are: 1. Common search technology;

2. Higher penetration of micros with modems;

3. Gateways

There is no question that electronic delivery is here to stay and that it will become more important as time goes on. In some cases it will perhaps supplant printed information but in general the present outlook is regarded as complementary overall to print media. In experiments to date to see how people might use electronic services there has been relatively little emphasis on real marketing. Financial Post itself has worked on a royalty basis with the direct service supplier. Thus in the QL case the item is priced on a pay per event basis. The customer pays QL and QL pays a royalty to Financial Post. Overall it is felt that customers have a preference for flat rate subscription pricing schemes. However, if one is working with a real time on-line system then the connect time charges are necessary in part because of the capacity limits of the system especially in terms of the communications ports. In a system which provides for downloading capability then a flat rate, unlimited usage pricing scheme would be more justified. It is to be remembered here that Financial Post is talking about a business audience.

Finally it was the feeling that many of the other printed products of MacLean-Hunter are much more amenable to electronic media than is the Financial Post. They involve lower circulation, more reference works and for their given volume are often quite expensive in print form.

Interview with C. Bowness, Financial Post

Financial Post's target audience for electronic information services is defined as the business market, where business is in turn defined as the ability to expense the cost of the service in question. In other words Financial Post does not presently attempt to cater to, nor does it foresee the likelihood of going after, an audience of people spending their own money. It is not believed that new electronic services are likely to supplant much, if any, of the traditional print market. Telidon is seen as being essentially a transaction system that will be used by people in time in order to save time and money. Ultimately it is believed that not to use Telidon type systems for transaction services will require the payment of a premium which will in turn force people to use such systems. As a general principle the Financial Post position is to develop services so as to be able to deliver information wanted or required by its audience in whatever form or mode that audience desires. This might mean, however, that over time, in order to get certain types of information in traditional ways, may require paying a premium as per the situation on transactions services noted above. Criteria relevent to the choice of mode by a reader include time, content, timeliness, convenience, cost and immediacy. It was noted that print media, magazines etc., are more suited to browsing and that this is a potentially major advantage. The long run relationship between print media

and the electronic information services is felt to be most likely a complementary one rather than a substitute one. In other words each will have certain things the other won't and/or will appeal to different audience segments. Although the Financial Post participated in the iNet trial, in general, it is not at present interested in starting a business venture with Videotex. If there were a viable service offering available and it was expected to have a reasonably good life, say around twenty years, then there might be some consideration of using that service. This is not felt to be a probable development at the present time. Financial Post does not envisage taking any initiative in developing such services.

Videotex is felt to be unattractive for their purposes because of cost, because support service is inadequate and because the page building process is somewhat cumbersome. But more importantly it is not felt to be being done right at the moment. It was said that the people involved in Videotex need to stop thinking as artists. Given that the unique characteristics of Videotex is the page characteristics the question is largely one of communications costs of data by pages versus standard format.

A major question is perceived to be that of how the telephone companies will enter the computer communications market. A major

issue is felt to be whether the companies will follow the route of leasing equipment or whether they will simply provide a system to which any and all types of terminal equipment can be attached. If, in fact the companies go into the terminal market itself it is felt that they will get dominant. Other services will then have to be compatible and capable of being added on to the telephone companies' hardward.

Aside from hardware compatibility there is the problem at present of software compatibility and the two together make the problem a more complex one. Dedicated terminal equipment is seen as undesirable in general as it limits the IP and the user. It is felt that in time terminal equipment will converge around the personal computer, perhaps coupled with various add-on modules.

As of January 1984 the Financial Post will begin to operate an on-line service which will offer ninety data bases to subscribers, six of which will be Financial Post's own. Pricing for this service will be based in some cases on time where there will be a connect time charge and in other cases on items, in other words, which data base item is chosen. Combination of time and content charges may also be possible. There will be a relatively small initial joining fee to cover administration charges. Some of the data bases will operate on a subscription

basis providing unlimited usage while others will be provided on a pay per item basis. Connect charges will apply to all uses of the system.

In terms of Bell's iNet system Financial Post does not want Bell knowing their clients' profile. Also he doesn't think that Bell should be in the factoring business, meaning they should not be buying accounts receivable which is the result of Bell taking responsibility for the billing on iNet. It is felt that in the longer term the residential market may be able to piggy-back, in certain respects, on the business market. First the business market may help to get hardware into the home, initially for business purposes. Secondly use in the office will create a familiarity with both the hardware and with services which will then make it easier to have them used in the home. From the point of view of IPs as well as users there may be a complementarity between residential and business sectors. For example, the Financial Post's stock market report could well become a desirable listing as part of an electronic Chatelaine.

For market purposes, in the extreme, developments such as this could move us towards a universal data base. To do so would lose the advantage offered by the original segmentation of the market. The offsetting consideration to this would be

the extra sales that might emerge. In terms of pricing for service itself, residential consumers are perceived to prefer subscription services with unlimited usage though very small users would be a clear exception to this. The business market on the other hand generally seems to prefer a "pay as you go" system. Communication costs are recognized as a long term concern for any major electronic information market development. This is seen as already worrisome but as pressures mount for various reasons for higher local calling rates the problem will become more extreme. It will also become more extreme if and when the carriers recognize data usage as a major new profit center which it will pay them to somehow distinguish from conventional service. If the carriers are operating gateway services such as iNet, it may be possible for them to internalize increased local calling charges, especially those which get passed back to the IP end of the market and this may give the carriers a competitive advantage over other service providers. The directory field is one which is also of concern re competition by the carriers. There are firms already in this field which carrier entry could supplant or usurp.

It was noted that an electronic directory is a far more powerful tool than a printed directory because of search possibilities. A further interesting question which arose involved that of government competition. Government currently,

through agencies such as Statistics Canada, is providing a variety of information services to the public which are also provided by private business. In electronic form government information services will be more identifiable and more accessible and the competition could become more extreme with respect to private business. The position taken was that government should and must provide raw data but that they should not "massage" that data, i.e. manipulate/transform the data, and publish those results in competition with private firms who are engaged in the same exercise.

Notes on Interview with OECA

Looking at the market in general, Prestel-like data bases are perceived as unlikely on the basis that the economics simply does not support such a system. Diverse databases centered at the community level where there is quick or easier in and out access is more likely to be the prevalent model. The Infomart approach is regarded as restrictive in terms of the cost of being there and the cost of access. It would be preferable to use existing computers to service various publics. Within the school system the constraints of videotex are regarded as too rigid for OECA. Educational usage requires more flexible programming capability.

TVO currently has a fifty thousand page database, half of which is in english and half in french with one hundred outlets. The biggest part of this database is a job counseling package. The entire database is in videotex format. For straight information retrieval functions videotex is seen as having value. Communications cost is, however, an impediment. In general, communication cost is the major impediment to service, representing at the moment 80% of the total cost in certain areas. If the telephone companies should go to a usage sensitive pricing scheme for local service this will influence greatly general market development for all computer based services.

Consistent with the Ontario government's emphasis on the development of Canadian software and hardware, TVO is to be a cataloguer and disseminator for software including the electronic distribution of software. Ontario is attempting to provide encouragement to publishers and authors in the private sector to produce such material and TVO will be part of this scheme. Ontario has also produced its own educational micro which for the moment does not have the Teledon graphics capability. Another problem with videotex is that there is a question of whether it is a good way of downloading. It is ex-

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pected that for educational purposes most applications will involve down-loading since this will minimize the impact of communications costs and will open up alternative communication modes as ways of delivering the service. For northern Ontario, for example, a satellite distribution system operating in a quasi-broadcast mode is seen as being the most cost effective means of delivery if coupled with local terminals having enough capacity and intelligence to provide inter-activity at the local level. Such a system would involve a continuous transmission with the local machine capturing the relevant part of the database as required. The system then is, from one perspective, essentially a one way system but for the user that characteristic is not distinguisable.

Networking between schools is expected to be a function of the initiative shown by individual teachers versus any formal institutionalized network. Again communication costs will be a major impediment to such development. Distributed software with local applications is seen as a more desirable way to go versus the use of commercial services as online services, etc. Industrial training packages are a very likely exception to this, since computers at the local level are not likely to be able to do this.

Regarding foreign content, it is perceived that there is a quantum difference in the computer case over the TV/book problem regarding the cultural sovereignty issue. This is a major reason for pushing the development of Canadian software. Ontario has put ten million dollars into the development of the ICON machine with another sum of money put aside for additional hardware grants. How much money has yet been designated for software was not known. TV Ontario is still operating its teletext service on a TV broadcast channel. As a general conclusion it was noted that there is a lot of hype regarding educational applications but that in fact we don't really know as yet what will happen.

Notes on Interview with R. Duchene, National Library of Canada

Necessary ingredients for the emergence of an appropriate market are seen as: 1. appropriate hardware; 2. appropriate software; 3. communication facilities; 4. appropriate content; 5. people who know how to use the system. At the moment electronic mail has definitely emerged as a clear market option. Value added networks are there already in a sense. The total size of the market for online data base services, it has been estimated in the U.S., will double between 1982 and 1987. In 1982, revenues in the data base market were 1.4 billion dollars. By 1987 estimates put them at 2.9 billion dollars.

The National Library has been operating a "bibliographic and communications field project". The major part of this has involved participation in the iNet trial in order to assess the utility of the new technology for library applications. The National Library has had two roles in the iNet trials, one as a direct participant and two, as the coordinator of the bibliographic interest group. Beyond the iNet trial the project is also examining legal aspects of networking and applications of video disc technology. It was noted that the unofficial cost of the iNet trial on the part of Bell has been placed at 6.9 million dollars. The iNet trial was organized by Bell by forming nine groups of which libraries were one. The others were: banking, broadcasting, legal,

manufacturers, petroleum, real estate, travel and government. The library area ended up in the first phase of the trial with more than twice the use of everyone else put together. At this point Bell has provided only inter-connection services and a directory which for Bell purposes eliminated the need for special equipment for each system. The question of how to use the system once connected so far, however, has been missing. Library people knew the answer on this since for them iNet was simply a different way of doing what they already were doing. This also explains the high level of usage for the library group and means that the results, therefore, are biased. The nine groups in the total iNet trial operated as closed user groups. In other words they did not have access to each others data bases. Within the library group each participant was both a user and an IP. This was not necessarily true for all groups. Bell provided terminals, directories, communication links and some data base creation in Videotex format. The libraries had existing transactions which could be placed in this mode. It was shown that in cases where the parties to the transaction know where they're going, what they're doing and have their own hardware that it will always be simplier and easier and cheaper to go direct rather than through a network such as iNet. There will, however, always be some new services which are not known even for heavy users. For

lighter users iNet begins to make more economic sense because they either don't know where they're going or volume is too light to support direct links. For an IP listing on a service such as iNet, the advantages are that it broadens their market and solves or eliminates the billing requirement and the risk of nonpayment. For libraries it is not seen as economically viable to create a Videotex data base. Also in technological terms libraries generally require boolean search capability rather than the tree structure which presently accompanies Videotex systems. Videotex graphics could be a nice addition but it was noted that 98% of library usage is pure text so that graphics capability is of marginal importance. For the iNet trial Videotex data bases were created. In general the library users did not like them. But there is a difference which must be born in mind between library users and non-library end users.

Regarding the possible substitution of the new technology for the traditional library model, it is too early to draw any firm conclusions. It will take a long time for the penetration of the new technology to get high enough to have any effect if it is going to. It was noted as well that no electronic media is yet as cost effective as books. Moreover there is an accumulated backlog of books and other print publications which will sustain part of the traditional role of the library even after or if all new material should

go electronic. It was emphasized that the new technology does not necessarily mean networking. Video disc is a major technology to watch in this regard. Right now it is just audio or at least primarily audio. Once video disc players go to mass marketed levels of production the price can be expected to fall. By 1987 a video disc player is likely to be selling for $300 U.S. versus its current price of $900 U.S. This will provide a digital medium made to hook up to micros and will become a standard micro adjunct. It will make it worth while to think of using it as a publishing medium for software and for data bases which have some life other than momentary. Also those data bases which are frequently used, at the same time as they are longer lasting, will be very amenable to this technology. The service which is likely to take off and indeed has already taken off first is electronic mail. It offers the convenience of being able to send anywhere at any time. There is a problem at present levels of usage and penetration that you cannot get to everyone you want to because not everyone yet has the service. Envoy 100 is now operating nation wide, however, and other services are coming on stream and the number of subscribers in this system is increasing. It is to be noted that this mail function is independent of the library function previously under discussion at least in any generic sense. Mail will have use both for internal

as well as external communications.

As terminals become increasingly portable and/or as hardware penetrates both the home as well as the office, the distinction between home and office will be progressively broken down. As micros become more capable the demand for networking will rise. It will become less possible to satisfy data needs locally and networking demand will rise in order to counter this problem. (Local here refers to a stand alone system). One will ultimately keep locally things that are wanted permanently and or used frequently. But an electronic media only takes one so far. Other media will still be wanted and necessary. The relationship ultimately should be a complementary one. For example, a lot of material sits on library shelves because people don't know about it or know where or how to find it, or don't want to take too much time to find it. Electronic media may be complementary in that it will help overcome these problems. It will not, however, for many users or many publications take the place of the print or hard copy itself. To "use", it is often necessary to feel and touch and carry around. One way of thinking about a mass market is in geographic terms. There is a lot of information that we want that is not necessarily about our own country. We may be talking in technological terms of a global market when we speak of a mass market.

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