

REVIEW OF PROJECT IDA
A RESEARCH AND DEVELOPMENT PROJECT
OF THE
MANITOBA TELEPHONE SYSTEM

The Manitoba Telephone System

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PROJECT IDA - CONCEPTION

In recent years, Western countries have experienced an explosion in new communications demands and potential.

These include:

- the rapid growth of data communications;
- an imminent major expansion of video services, including Pay TV;
- the merger of data processing and telecommunications.

In this changing technical environment, MTS recognizes the need to develop the skills of its professional staff to better understand the equipment, software, and other characteristics of these advanced communications. Moreover, it sees the need to equip its planners and engineers with the necessary knowledge to develop network planning into the 1980s.

MTS is in a unique position in North America: it has ownership and control over coaxial cable networks. As a Provincial Crown Corporation, MTS is obligated to utilize the full capacity of its networks in order to meet the broadest variety of communications needs of our customers. MTS has established relationships with a number of suppliers of equipment for the coaxial cable facilities. However, such suppliers specialize in products designed for cable television and do not address the potential multiplicity of coaxial cable communications applications that are of interest to telephone common carriers.

In view of these factors, the MTS Board of Commissioners determined that it is both advisable and necessary for the System to participate in limited research and development activities in order to assess

long-range engineering design requirements and to provide opportunities for the development of professional staff.

In October, 1978, the MTS Board considered a proposal on ways to optimize the high capacity of coaxial cable facilities through exploration of multiple applications that might be introduced on the network. As a result of its examination, in November, 1978, the Board endorsed the pursuit of a technological trial, later to be known as Project Ida. The intent of the project was to determine the most efficient and economic means by which to make the best use of MTS's investments and assets and to promote the development of staff in advanced telecommunications equipment and techniques. The specific technical purpose of the project was to test a concept for the delivery and distribution of a variety of advanced telecommunications services, as well as telephone, over a single, broadband transmission facility. In addition, the System sought to assess the reaction of customers to these new services.

Project Ida, then, was a technology trial to examine a concept. In operation it tested a complex communications system consisting of many components, such as computers, microprocessors, software packages, and a host of related devices designed to operate over coaxial cable.

Project costs were included in the System's 1978/79 Capital Budget which was filed with the Public Utilities Board of Manitoba. In December, 1978, as part of the System's rate application presented to the PUB, MTS reviewed the tentative plans for an experiment involving the integration of a number of telecommunications services using coaxial cable.

CONTRACT AWARDED TO ISL

The Manitoba Telephone System itself has neither an ongoing research and development nor a manufacturing capacity, both of which were required to undertake Project Ida. Therefore, a public call for tenders for the provision of the design and manufacture of equipment for the technology trial was made. After a review and assessment of eight replies to the tender call, it was determined that Interdiscom Systems Limited (ISL) had submitted a proposal closest to the specifications of the request for quotations. In addition, taking all factors into consideration, ISL also submitted the lowest cost solution.

ISL was a new company at the time, and moved its staff and operations to Winnipeg on the basis of its contract with MTS. Operated by outstanding technical experts, its principal shareholders are T.J. Moorehead, N. Toms, G. Kinch, J. Coyne and J. Champagne, four of whom reside in Winnipeg, owning, among them, 54.2% of issued shares. The remaining shares are held by ISL employees.

Subsequently, the site of the Project was changed to South Headingley, and the scope and details of the project were expanded, calling for alterations in original contractual arrangements. Because of these changes in the scope, site and detail, the total cost of the project was \$2.2 million. (See details in Appendix). This figure compares to an estimate of \$1.5 million made in November, 1978.

PROJECT IDA RESULTS

In terms of testing the original concept of the system proposal, Project Ida, in fact, verified that a wide variety of telecommunication services can be delivered over a coaxial cable network. Moreover, it gave the MTS insight into the network planning and 'hands-on' experience it sought.

A number of steps were taken to weigh and measure the future value of the concept tested in Project Ida. The original proposal was carefully reviewed by the staff of MTS, in conjunction with external consultants, and examined in depth by both the Executive Committee and Board of Commissioners. In addition, as indicated previously, the proposal was discussed at length with the Public Utilities Board in December, 1978.

Throughout the development and operation of the project, the concept, system and its components were evaluated on an ongoing basis. This assessment took the form of weekly reviews chaired by the Assistant General Manager. MTS Project leaders made this assessment:

We are confident that this experimental system has the potential to evolve into a sophisticated telecommunications network capable of providing a wide range of services and applications. To date we have been able to verify the validity of a number of design concepts, inherent in the design of the Ida network. As well as establishing the validity of the overall design concept, the project has provided invaluable information with which to evaluate future broadband telecommunications technologies.

An additional external study was completed by a service-technology review team chaired by Dr. W. Kinsner, Director of Research, Industrial Applications of Microelectronics Centre, Inc., University of Manitoba.

The report contains this conclusion written by the team's chairman:

The Omnitel 2 system is being impressively demonstrated on a small field trial basis (100 homes) at Headingley, Manitoba. The major services of Omnitel 2 have been incorporated and are fully operational. This is a major accomplishment, and must be considered in any evaluation of the performance of ISL (Interdiscom) and MTS. The time within which the field prototype was developed by the ISL and MTS groups is equally impressive The Omnitel concept and technology represent an important development in system planning and implementation. The implications of this development are far reaching. The creation of a new company (ISL) to develop the system, the cooperation of ISL and MTS, another high-technology company, to experiment with a field prototype and to identify the best selection of the distribution technologies, the potential to create jobs for some 250 people for this new industry in Manitoba and elsewhere, and the potential to stimulate new directions in the educational sciences that are being provided to the young people in Manitoba - to name a few - could be considered as some of the implications.

In addition to proving that the principle of combining a number of services over one integrated network is technically feasible, Project Ida has provided invaluable experience for MTS staff.

Expertise gained by MTS staff has been put to good use in a number of innovative projects, including:

FAST - this alarm service utilizes technology spawned by Project IDA to offer fire, intrusion and other alarm services over MTS's paired-wire network. Working in conjunction with private alarm companies, MTS has been offering this service since March, 1981.

GRASSROOTS - Grassroots is the world's first commercial application of Telidon.

A joint venture between MTS and the electronic publishing firm, Infomart, Grassroots links information providers with Manitoba's agribusiness community, over the existing paired-wire telephone network.

ELIE - The Elie-St. Eustache fibre optics trial encompasses many of the services provided in Project Ida, with the exception that the distribution network is now fibre optics cable. This trial, sponsored by Department of Communications, Canadian Telecommunications Carriers Association, Manitoba Telephone System, in cooperation with Northern Telecom Canada Ltd. and Infomart, came about in 1979 after MTS's involvement in Project Ida was announced.

As well, MTS staff have been called upon to transfer the experience gained in Project Ida to other areas of telecommunications. MTS has undertaken a study for a major retailer utilizing its experience in the delivery of integrated services.

Project Ida also brought about the introduction of cable television programming to Headingley, Manitoba, and enabled MTS to improve the quality of telephone service. Moreover, various segments of the lay and educational community gained valuable experience in educational television programming.

One of the important elements of the project was to assess the public response to a range of new telecommunications services. Project Ida participants demonstrated a considerable enthusiasm for a number of these services, indicating their future potential marketability.

SUMMARY OF TECHNICAL ACHIEVEMENTS OF PROJECT IDA

Through Project Ida, MTS has been able to verify the validity of the following design concepts:

- use of a coaxial cable (CATV) network to carry voice, data and video services;
- ability to carry up to 32 TV channels at accepted industry standards;
- security offered to CATV and Pay TV Operators by use of outdoor channel convertors;
- security from unauthorized use of Pay TV by system's ability to recognize valid customers;
- usage sensitive pricing for services including telephony, videotex and Pay TV;
- ability to charge for Pay TV on a monthly, per program or per minute basis;
- feasibility of a polled alarm reporting system which will initiate alarm messages independent of any other services or messages on the system;
- use of a high-speed (4800 baud) data channel to carry Telidon (videotex) at faster speeds than via telephone network without tying up the customer's telephone or the telephone company's switching network. The higher speed also results in a faster output of information from the computer data base, thereby freeing it up to serve more customers;
- capability of coaxial network to carry digitized telephone service, thereby allowing the provision of one or more telephone lines to each house without the provision of a pair of telephone wires into the house.

ISL STATUS AND OPPORTUNITIES

ISL has fulfilled all of its obligations under the contract with MTS for the development, installation and maintenance of Project Ida. The only outstanding issue is the debenture, which has a current value as of January 31, 1982 of \$660,312, comprised of \$500,000 principal and \$160,312 accumulated interest. In 1980, while the Project was well under way, it became apparent that because of tight deadlines and unanticipated supply problems, the staff of ISL had been required to commit all of its available resources to the technological facets of the company's operations and the trial. By Spring, it became clear that this preoccupation had resulted in severe financial difficulties for ISL. MTS then faced the choice of either abandoning the project or making arrangements to secure financing for ISL. With the project nearing successful completion, the Board of Commissioners decided to issue the debenture. Under the terms of the debenture, ISL is prohibited from disposing of any assets or permitting any effective change in ownership, etc., without written consent from MTS.

It is our understanding that ISL is currently entertaining proposals from an Eastern Canadian company which is interested in acquiring or making equity investments in the company. MTS has become involved to some extent in these negotiations due to the outstanding debenture and the powers granted within it to MTS. As consideration for the debenture, MTS is exploring the acquisition of "Technology Rights" which could contain such factors as price discounts on equipment purchased, exclusive product distribution rights, right of first refusal on trialling new products, etc. The precise definition of these rights is still subject to negotiation.

Whereas MTS is hopeful that some benefits can accrue to it as a result of this proposed arrangement, it has concluded that it should write off the debenture on the basis, confirmed by independent review, that MTS received good value for funds paid to ISL for the successful completion of Project Ida.

APPENDIX

DETAILS OF FINANCIAL ARRANGEMENTS BETWEEN MTS AND ZSL

*Section I - Initial Contract and Supplements for
Ida Trial*

Section II - Debenture

Section III - Other Contracts

SECTION I - Initial Contracts and Supplements

On June 27, 1979 a contract was signed between MTS and Interdiscom Systems Limited (ISL) whereby ISL agreed to provide MTS with Experimental Alarm Reporting and Associated Vertical Services System for the Ida Trial in Headingley.

1. The June 27, 1979, contract for \$875,212 was for the design and manufacture of a 100 home Experimental Alarm Reporting and associated Vertical Services System and was subject to the following conditions:

That in the event that Interdiscom or any of its affiliates entered into a Sale or Licensing Agreement pertaining to similar systems, that MTS should be entitled to receive a royalty fee on all sales and license fees received from such agreements. This fee is 3% of such sales and license fees for a coaxial cable based integrated broadband system and 1% of such sales and fees for a fibre optics based integrated broadband system up to a maximum of \$1,200,000. Furthermore, MTS was granted an option to participate with Interdiscom in joint international marketing ventures. In addition, the exclusive proprietary rights to the computer software developed by MTS would be made available to Interdiscom for resale purposes by Interdiscom subject to a 3% royalty on such sale (by Interdiscom) being paid to MTS up to a maximum of \$300,000. These royalties are to be payable for a ten year period from the date of contract signing (June 27, 1979).

2. MTS and Interdiscom entered into an agreement dated November 9, 1979, for \$360,000. Under this agreement, Interdiscom was to develop and design large scale integration technology for the Omnitel II System and to provide a prototype model incorporating the technology. In addition, the agreement amended the original agreement of June 27, 1979 by increasing the royalty fee on all

sales and license fees received by Interdiscom on such sales. The fee of 3% on sales and license fees for coaxial cable based integrated broadband systems and 1% of fees for such sales and license fees for fibre optic based integrated broadband system was increased to a maximum of \$1,740,000. In addition, MTS is entitled to royalty fees at a rate of 50% of the 3% and 1% fees after MTS has recovered \$1,740,000. In addition, the November 9, 1979 contract stipulated that if Interdiscom was unable or unwilling to manufacture or deliver to MTS any broadband coaxial cable based product developed from the work described in the November 9, 1979 agreement, then, MTS should have the right, free of any royalties, license fees and other Charges to use all materials, drawings, designs and computer software developed under the November 9, 1979 agreement or any amending or supplemental agreement thereto for MTS purposes. In addition, Interdiscom agreed not to sell, assign or otherwise dispose of any such materials, drawings, designs from computer software and any patent or copyright or other rights based on them subject to the rights granted to MTS under the November 9, 1979 agreement.

3. On February 21, 1980, MTS and Interdiscom entered into a contract for \$64,000 for pre-installation testing of the technology being provided for the Ida Trial.

4. MTS and Interdiscom entered into an agreement dated March 26, 1980, for \$300,000. This contract required Interdiscom to perform additional integration testing and maintenance work on the experimental system to a value of \$156,000. The balance of \$144,000 was payment for work performed by Interdiscom for which MTS had not paid Interdiscom. It was a condition of this contract that the royalty fees (at the 3% and 1% schedule that MTS is entitled to for sales and license fees received by Interdiscom)

be changed to a maximum amount of \$2,190,000. After having recovered the \$2,190,000 MTS is entitled to 50% of the 3% and 1% of further sales and license fees.

The agreement also amended the royalties clause of the June 27, 1979 contract to the extent that the royalty fees are payable to MTS for a term of 10 years from the date that the Chief Engineer of MTS certifies in writing that the "works" referred to in the June 27, 1979 agreement have been completed to the satisfaction of MTS (rather than 10 years from June 27, 1979).

5. MTS and Interdiscom on January 7, 1981 entered into a contract in the amount of \$115,000 for the provision of maintenance in the Ida Trial up to February 28, 1981.

6. On January 29, 1981, a \$480,000, four-month consulting contract was signed by MTS and Interdiscom to examine various telecommunications technologies, evaluate the Ida technology and analyze options for future networks.

Pursuant to a letter dated January 28, 1981, Interdiscom agreed with MTS that MTS has the right to use without charge any improvements or inventions made to the Omnitel System by Interdiscom which may arise out of the performance of the consulting agreement for \$480,000.

7. MTS and Interdiscom entered into a \$45,000 contract on September 25, 1981, for provision of maintenance on the Ida system trial from July 1, 1981 to March 31, 1981.

SECTION II - Debenture

1. A Debenture for \$500,000 with interest at 1% above the Toronto-Dominion Bank prime commercial rate, repayable on or before December 31, 1980, in a lump sum payment of the principal of \$500,000, plus accrued interest to the date of payment was approved by the Board of Commissioners on March 10, 1980.

The July 31, 1981, audited statements of ISL noted that the MTS debenture, "a fixed and specific charge on all assets of the company ranking second in priority to bank loan collateral, has been given as security". Such assets would include the rights to patents held by ISL.

The debenture ranks in priority to all other obligations of Interdiscom excepting:

- those obligations arising in the ordinary course of business which Interdisoom may owe to its banker;

- an Assignment of Book Debts made by Interdiscom in favour of the Toronto-Dominion Bank;

- a loan made by the Bank of Montreal to Interdiscom under the Small Business Loan Act which loan is secured by certain chattels owned by Interdiscom.

In addition to the usual covenants that a borrower grants to a lender under the terms of a standard bank debenture, Interdiscom Systems Limited covenanted that:

1. it would not reduce its capital or make any distribution of assets or redeem, purchase for cancellation or otherwise retire any of its present or future issued and outstanding capital stock, except in accordance with a certain employee stock option program entered into with certain employees of the Corporation;

2. it would not make capital expenditures or incur any debt or liability for the eight-month period ending December 31, 1980, which aggregated more than \$100,000;

3. it would not pay or make any payments on account of shareholders' advances or moneys due to shareholders, directors, and officers or the wives or children of such shareholders, directors, or officers;

4. it would not lend any amount to shareholders, directors or other persons, firms or corporations, other than in the usual course of the Corporation's business;

5. it would not pay salaries to its five senior executives for the eight-month period ending December 31, 1980, which aggregated more than \$150,000;

6. it would not pay to Coyne Associates Systems Consultants Ltd. a sum exceeding 410,000 per month on account of the existing liability of the Corporation to Interdiscom.

2. Subsequently, a Supplemental Debenture was signed by MTS and Interdiscom on January 6, 1981. This Supplemental Debenture extended the time for repayment of the original debenture from December 31, 1980 to June 30, 1981. The Supplemental Debenture was subject to the following terms and conditions:

1. MTS is granted an option to own 11% of the total issued shares of Interdiscom. However, if MTS exercises this option, the debenture for 4500,000 plus accrued interest on the debenture is deemed to be discharged in full;

2. Interdiscom is to provide MTS with an up-to-date business plan of Interdiscom prior to June 30, 1981;

3. MTS and Interdiscom are to negotiate equity participation in Interdiscom in addition to the 11% equity participation referred to in

paragraph 1. Such negotiation age to occur prior to June 30, 1981;

4. Interdiscom is to provide MTS with an unaudited monthly financial statement, including monthly balance sheets, cash flow statements and profit and loss statements, commencing January 20, 1981;

5. Interdiscom is to allow MTS to examine all the books of accounts, records, financial reports and other financial papers of Interdiscom.

3. To date, no payments have been received on the principal and interest on the debenture for \$500,000 which was due and payable in full on June 30, 1981. At the August 10, 1981 Board of Commissioners meeting the Board agreed that the debenture should not be extended but should be treated as matured and payable upon demand at the option of the MTS.

SECTION III - Other Contracts

1. MTS signed a consulting agreement with Interdiscom on June 16, 1981 for \$100,000. The completion date for the contract was September 30, 1981. This contract formed part of a total program which resulted from discussions between ISL, MTS, NABU Manufacturing and the Federal Department of Industry Trade and Commerce. This total program related to ISL receiving funding from Industry Trade and Commerce (\$180,000) to allow ISL to perform research and development work on the concept of an integrated distribution network. NABU provided funding of \$100,000 so that ISL could engineer and design products capable of using the integrated distribution network to deliver a large number of services such as CATV, Pay TV, Alarms, Meter Reading, Energy Management, as well as Data Services such as Videotex, Teletext and Home Computers. This concept was of interest to MTS since any such products would have a wide range of applications in both the common carrier and CATV environment and a security system would have to be devised which would prevent end users from using the services provided on an integrated distribution network without paying for the services. Therefore, MTS entered into the June 16, 1981 contract whereby ISL agreed to investigate, evaluate and provide summaries of various security systems and to work on the development of a headend scrambling system which would provide the type of security that MTS requires as the carrier of multi-service signals on coaxial cable.

2. On September 11, 1981, MTS signed the following contracts with Interdiscom:

- a) \$3,000 contract for provision of equipment in the Town of Elie, for the Elie, Fibre Optics Trial;
- b) \$37,967 contract for furnishing, supplying and testing certain communication equipment and supervising installation thereof in the Town of Elie for the Elie, Fibre Optics Trial;
- c) \$65,000 contract for development of mini-computer portion of a measurement system for use in the Elie, Fibre Optics Trial.

APPENDIX II

VISITORS TO IDA TEST SITE

During the Ida trial, the Manitoba Telephone System maintained an Ida Test Site at 20 Seekings Street in South Headingley. Visitors to the site included representatives from the following areas.

Governments:

Australia
Canada
China
France
Israel
Manitoba

Companies:

Great West Life
Federal Industries Ltd.
Manitoba Research Council
Eatons of Canada
Cablecom Corporation
Iverson Engineering Associates
Bell Labs

Other Telephone Companies:

Alberta Government Telephones
SaskTel
BC Tel
TCTS Ottawa
Quebec Telephone
AT&T
Garden Valley Telephone Co
edmonton telephones
Telecom Singapore
MT&T
CTCA Ottawa

Media

Winnipeg Tribune
Winnipeg Free press
Globe & Mail
CJOB
CKY-Radio; Television
CTV News
CKND
CBC - Radio; Television
Financial Post
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