STRATEGIC INFORMATION MANAGEMENT PLAN

JUNE 1990

Informatics Management Branch

Canada

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COMMUNICATIONS CANADA :
STRATEGIC INFORMATION MANAGEMENT PLAN

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INTRODUCTION

1. INTRODUCTION

Information is a critical and costly resource that requires careful stewardship. Information Management (IM) involves optimizing investments in creating and using information in relation to the business and priorities of the organization. It deals with the whole life-cycle from creation to destruction or archiving. IM cuts across organizational and program lines.

It is only recently that information has come to be regarded as an asset that must be managed. More senior managers are beginning to recognize IM as a strategic issue that cannot be effectively handled as a by-product of other managerial activities as a result of:

- growing demands arising from restraint,

- high and growing costs,

- accelerating rate of technological change, and

- increasing complexity of decision-making

The Department of Communications (DOC) has undertaken a review of how information resources and technologies are managed in the context of the Department's strategic directions. Attention has been focussed on common issues and has resulted in a convergence of IM strategies among the key informatics groups within the Department. This document reflects the output of these deliberations, and outlines the strategic direction for information management within DOC for the next five years.

This IMP is not a mechanism for obtaining approvals for IM initiatives or expenditures, as each of the major initiatives outlined in the priorized plans section will be justified on its own merit. However, it does provide an overall context, approved by senior management, for the evolution of information management within the department. It will be revisited annually to reflect changing trends and conditions.

EXECUTIVE SUMMARY

2. EXECUTIVE SUMMARY

The mission of the Department of Communications is:

NATION BUILDING   *Helping Canadians share their ideas, information and dreams*

Information Management is critical and intrinsic to the achievement of this mission. Informatics, the automated aspects of information management, has become central to the Department's strategies for delivering most of its program, especially in a climate of restraint. At a cost of $32.6 million in 1989-90, it has become a major investment by the Department accounting for 9.9% of total expenditures. DOC has realized good returns on this investment through the application of technology as a means to satisfy program needs rather than an end unto itself. It is committed to build on these successes through sound management practices driven by program priorities and through a continued tradition of innovation.

As the Department moves toward its future goals of nation building, continuing to develop the Canadian identity,promoting excellence in Canadian products and services, and normalizing the irregularities that inhibit domestic growth and access to international markets, the following internal factors will be critical to its success:

- Improved Program Delivery through regional decentralization

- Improved Internal Communication

- Improved Access to Information

- More Efficient and Effective Operational Systems

- Proactive Accommodation of Technological Changes

- More Effective Policy development

In addressing these critical success factors over the next five years, DOC intends to become a model for others in using technology for communications and information management. This vision includes the following components:

- high quality information readily accessible to all who need it;

- simplified administrative processes through judicious and people-centred use of proven technology;

- an intelligent workstation for every employee (where required);

- easy electronic communications among workstations;

- controlled costs to maintain existing applications, data and technology to permit greater emphasis on the Department's mission and new and improved activities;

- dedication to the training and support of both the creators and users of innovation

- a balance of cooperation for integration and independant tailoring of systems to specific needs among the informatics communities.

The extent to which technology has been applied to the mandate of the Department varies widely. Significant penetration of information technology by program activity is shown .

DOC has five distinct communities for whom day to day operations depend upon the use of technology for IM. The emphasis for each of these communities is primarily on the management of its program, and then on the management of information in a program context.

Research - Information Technology is a basic working tool for the majority of researchers.

MAJOR APPLICATIONS BY PROGRAM ACTIVITY

Pie chart with sections labeled: COMMUNICATIONS DEVELOPMENT, POLICY DEVELOPMENT, REGIONAL REPRESENTATION, SPECTRUM AVAILABILITY, RESEARCH & DEVELOPMENT, SPECTRUM QUALITY, SPECTRUM ACCESS, GTA, TECHNOLOGY AND RESEARCH, SPECTRUM MANAGEMENT & REGIONAL OPERATIONS, CULTURAL AFFAIRS AND BROADCASTING, CORPORATE POLICY AND MANAGEMENT, SUMMITS AND DEVELOPMENT, CORPORATE POLICY, MUSEUMS AND HERITAGE, CORPORATE MANAGEMENT, SUPPORT TO THE ARTS, CULTURAL INDUSTRIES, SITE AND TECHNICAL SERVICES.

LEGEND: EFFECTIVE APPLICATIONS, ADEQUATE APPLICATIONS, APPLICATION SHORTFALLS, BASIC OFFICE AUTOMATION

Projects in integrated circuits, high-definition television, the stationary high altitude relay platform, workplace automation and many others important to the effectiveness and international leadership role of DOC could not be undertaken without equipment that meets very specific operational requirements. Aging or underpowered technology is a major constraint upon the quality of communications research.

Government Telecommunications Agency (GTA) - Networks and services which provide substantial savings to the federal government are in the midst of a period of major growth and modernization. The large volume of transactions have required considerable automation which has allowed GTA to maintain a high level of service. Requirements and opportunities are growing.

Spectrum Management and the Regions - The management of the radio spectrum and regional operations requires well integrated Information Technology. Substantial progress has been made in rationalizing licensing systems and services to achieve more efficiency and cost effectiveness. A 24% increase in workload since 1985 has been accommodated despite a 10% decrease in person years. As pioneers in the effective use of technology, some of the earlier applications developed must now be migrated to replace information technology that is on the verge of becoming obsolete.

Canadian Heritage Information Network (CHIN) - Subscribers from over 20 countries and 340 institutions access the internationally recognized cultural and conservation data banks. The success of this service is fueling requirements for expansion and further enhancements. Much of the data is owned by member organizations.

Corporate Management - Effective use of automation in corporate applications has received less attention than other areas. New systems development is urgently required to address weaknesses which have led to duplicated processes and widespread dissatisfaction with the service that can be provided with the limited resources available.

Critical to the successful evolution of existing and new applications in support of the mission is a firm understanding to the information requirements of the Department. In response to internal needs and to the Treasury Board Policy on Management of Government Information Holdings, extensive information analysis must be carried out within DOC.

CURRENT DOC INFORMATION PROCESSING ARCHITECTURE
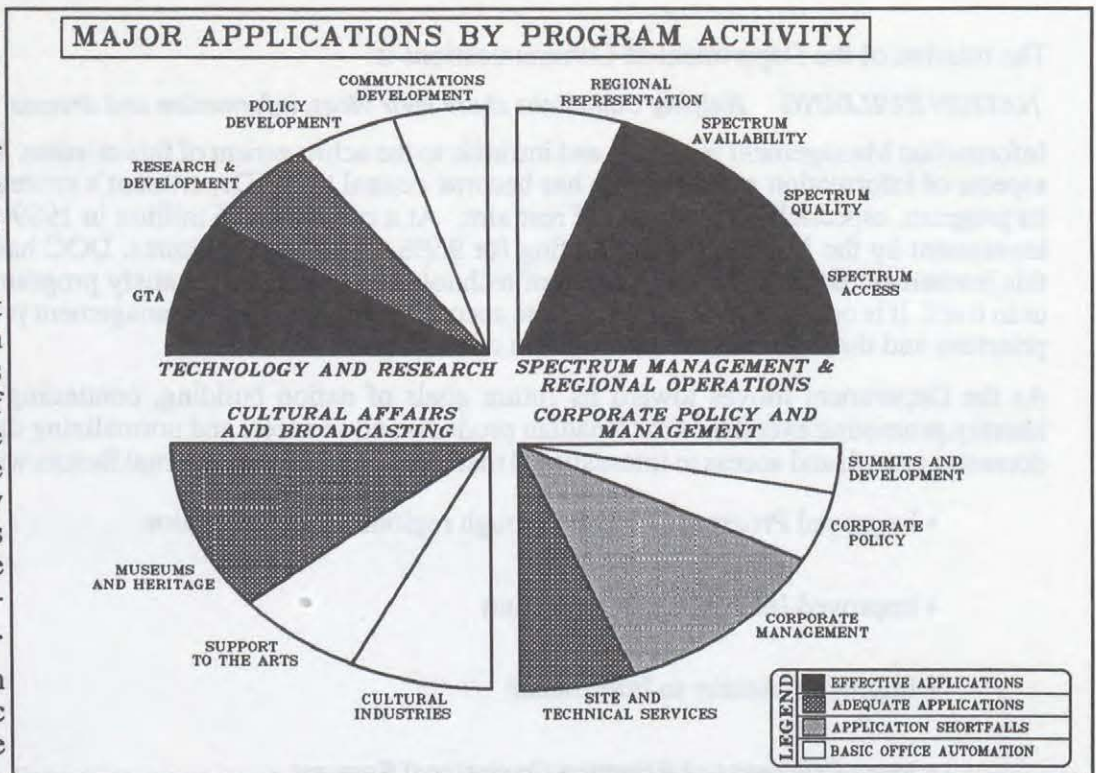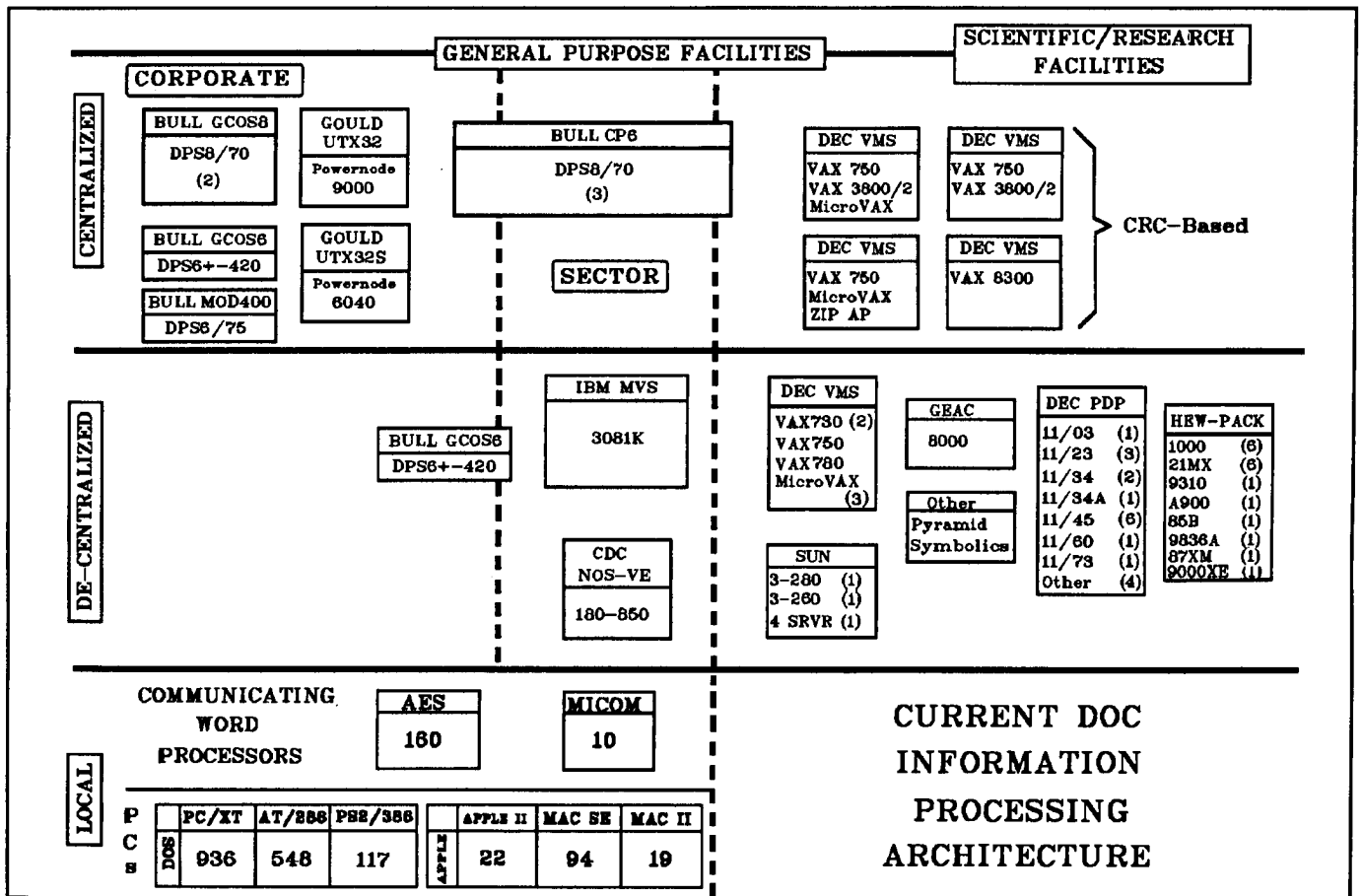
Diversity is intrinsic to the business of DOC and this is reflected in a complex technology base, acquired over time to address unique needs. These diverse requirements preclude the adoption of a single operating standard for the department - in fact, it is in line with the technology-oriented mission of the department to work towards achieving interoperability and integration of a variety of technologies. It has become obvious, however, that internal resources are spread too thin, and that too much of the annual IM budget is devoted to supporting the existing base, thereby limiting the flexibility to engage in the new development required to better serve the program mission.

The key technology-driven actions to be taken over the medium to long term are to:

- Focus on a limited set of information processing environments that can satisfy both the general purpose and research needs of the department

- Select a database management system that will support the longterm transaction-processing requirements of core management applications and program services, as well as facilitating access to information through government-standard reporting (SQL)

- Migrate existing management and program applications from the aging CP-6 operating system to a new processing environment

- Provide a longterm, modern and powerful processing platform to improve the quality of research

- Migrate departmental networks to OSI standards, providing interconnection and interoperability with effective network management

In order to meet the challenges of program support in the future, and to address the urgent needs of the present, a number of strategically significant Information Management projects have been defined for DOC. They represent internal priorities based on the relatively limited informatics resources available for new work. As results from some of the projects are realized, simplified information processing architectures will require less support resources, which will in turn leverage the departmental capability for new development. A critical factor in this new development will be the proper analysis of user needs in determining the right technology solution to business problems.

The next several years will be a challenge to DOC, specifically CP-6 offload and research consolidation, which are beyond the fiscal means of the Department to undertake. The section number that describes each initiative is shown in brackets.

- Modeling of DOC's information holdings in terms of the businesses comprising our mandate leading to the establishment of subject databases **(8.1)**

- Development and integration of core management information systems to support financial, personnel and materiel management across functional boundaries **(8.2)**

- Redevelopment of the Correspondence Control System to capture full text of incoming correspondence and responses and extend usage within the department **(8.3)**

- Continued enhancement of the existing Spectrum Management System (SMS) to accommodate advances in radio technology, new modulation types and new radio services and to replace obsolescent database technology **(8.4)**

- Evolution of the Spectrum Control Operations and Management prototype into a production system in order to provide better tools for spectrum control **(8.5)**

- Provision of a Department-wide integrated office system **(8.6)**

- Senior Executive Network **(8.7)**

- Enhancement of the Canadian Heritage Information Network (CHIN) to better serve domestic and international heritage institutions, and to enhance Canada's profile in the world arena **(8.8)**

- Evolution of the GTA Telecommunications Circuit/Service Inventory System **(8.9)**

- Improvement of responsiveness of GTA Billing Systems **(8.10)**

- Creation of an Electronic Directory of the Federal Government **(8.11)**

- Offload of obsolete CP-6 operating environment **(8.12)**

- Modernization of Research processing facilities **(8.13)**

- OSI Standardization and evolution of Internal Communications Infrastructure **(8.14)**

INFORMATION MANAGEMENT FRAMEWORK
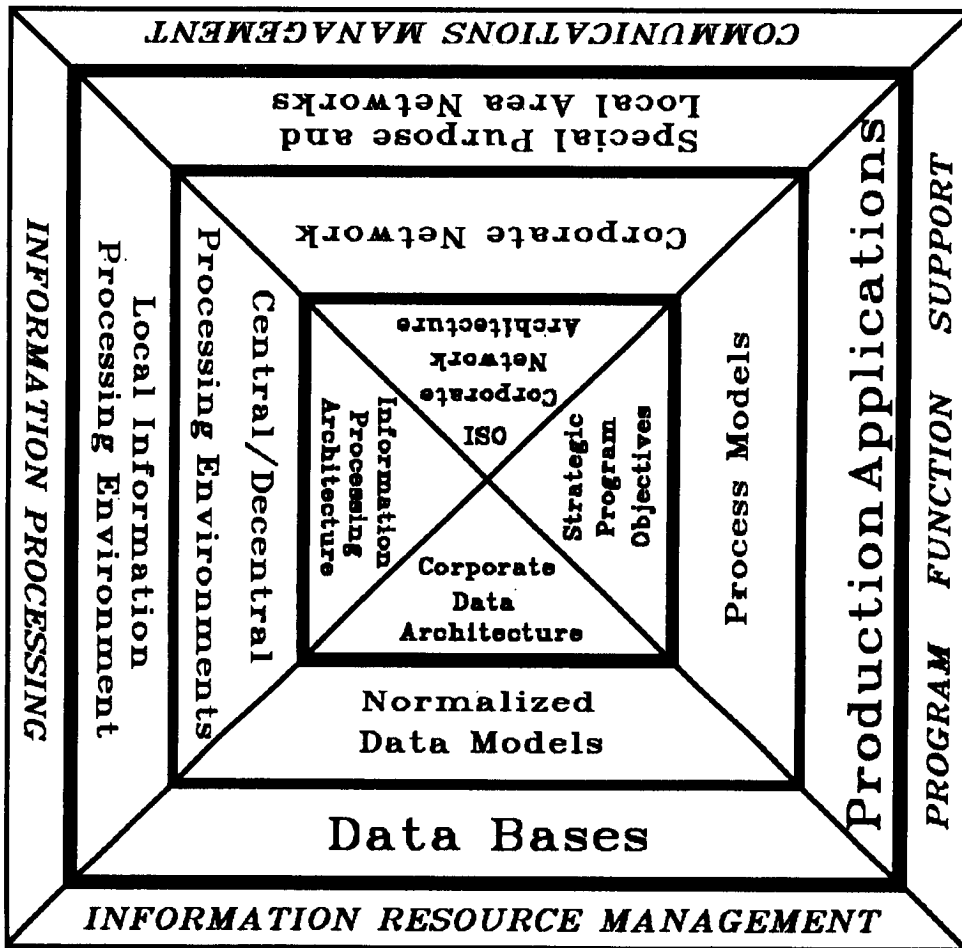
3. INFORMATION MANAGEMENT FRAMEWORK

The information needs of the department are satisfied by a suite of Program-based and Technology-based services, oriented toward satisfying business needs through the judicious application of technology, as follows:

PROGRAM SERVICES

• The principle thrust of Program Services, comprising Program Function Support and Information Resource Management, is to put in place the data and information systems that satisfy the demands of the department's programs and activities in a timely, high quality and economic manner.

TECHNOLOGY SERVICES

• The principle thrust of Technology Services, comprising Communications Management and Information processing, is to provide the required processing and communications infrastructure to facilitate inter- and intra-departmental communication and access to information.

COMMUNICATIONS MANAGEMENT

Special Purpose and Local Area Networks

Corporate Network

Information Processing Architecture — Corporate Network Architecture — OSI — Strategic Program Objectives — Corporate Data Architecture

Normalized Data Models

Data Bases

INFORMATION RESOURCE MANAGEMENT

INFORMATION PROCESSING — Local Information Processing Environment — Central/Decentral Processing Environments

Production Applications — Process Models — PROGRAM FUNCTION SUPPORT

The interrelationship of these services and their components are depicted in the above diagram. Each service is driven by a strategic planning component, which integrates the various service strategies at the highest level, thereby linking all information management activities to the mission, strategic objectives, and critical success factors of the department.

3.1 PROGRAM SERVICES

INFORMATION MANAGEMENT PLANNING

- The development and maintenance of a strategic Information Management Plan in support of the department mission and goals is primarily the responsibility of the Informatics Management Branch. This plan encompasses both the functions performed by the organization, the information used in carrying out its mission, and their interrelationships. It seeks to understand the essential data, its flow and interaction with parts of the business, and to establish priorities for providing new information.

- Primacy for Information Management Planning rests with the Informatics Management Branch. However, each sector has a special responsibility for the information and technology essential to the delivery of its programs.

PROGRAM FUNCTION SUPPORT
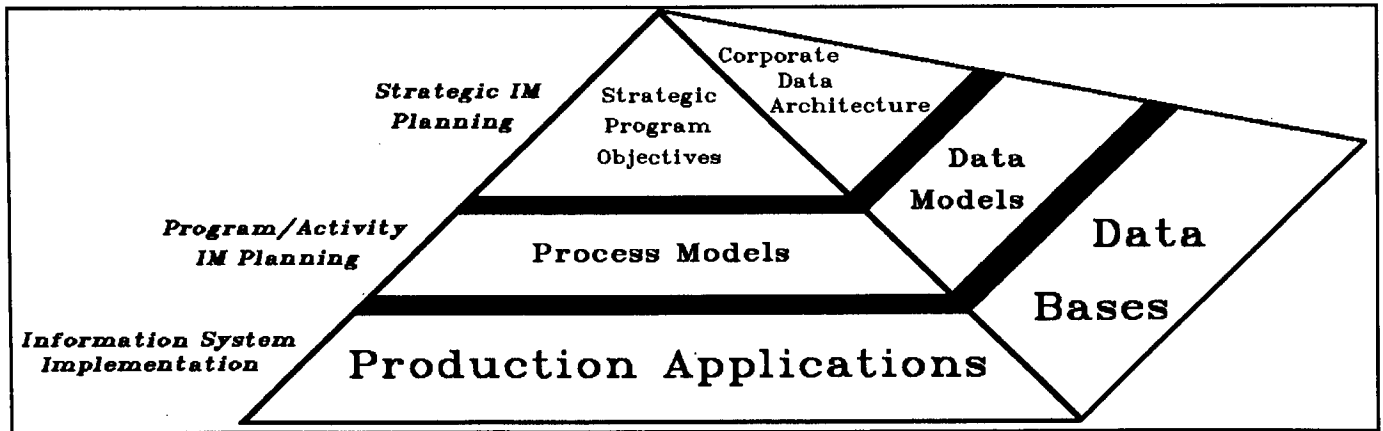
- The analysis, design, implementation, and ongoing support of informatics solutions to specific business needs within the context of an approved strategic information management plan. Solutions should be based upon business case analysis performed according to established government practices.

- Support activities include enhancement of applications, specialized training in the use of applications, and consulting services, where required.

- Primacy for development and support of corporate applications rests with the Informatics Management Branch. Primacy for the development and support of mission-oriented applications lies with the prime sector responsible for the specific function being addressed. Primacy for the development of personal applications lies with the individual, and should adhere to commonly used technology to facilitate extension of the application to a broader client group as it matures.

- Support of local office technology and applications rests with each sector or branch.

INFORMATION RESOURCE MANAGEMENT

- Development and maintenance of data architectures that facilitate the collecting, storing, transferring and processing of data and metadata (data about data) to service the broad information needs of the organization.

- Primacy for the development of corporate data dictionaries and models rests with the Informatics Management Branch. Primacy for the development of mission-oriented data dictionaries and models rests with each sector, including responsibility for accuracy and integrity of production data.

3.2 TECHNOLOGY SERVICES

INFORMATION TECHNOLOGY PLANNING

- The development and maintenance of a strategic Information Technology Planning component of the department Information Management Plan. This plan accommodates the IM needs of the department, and positions future technology to best serve the strategic objectives, recognizing industry trends, emerging international/ government standards, and the impact of rapidly changing technologies.

- Corporate Primacy for Information Technology Planning rests with the Informatics Management branch. However, each sector is required to develop local technology plans within the framework of the strategic corporate plan.
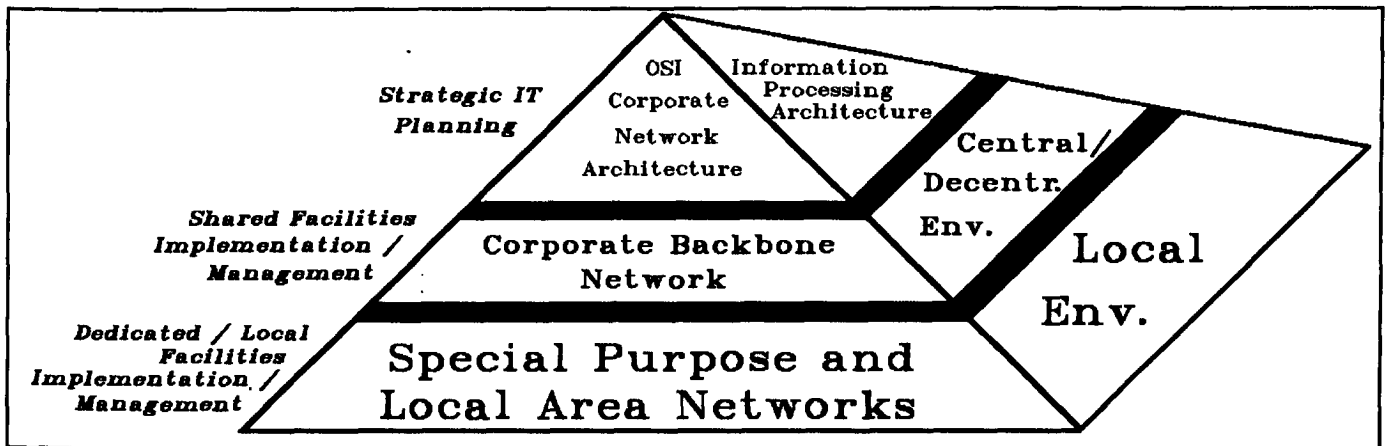
INFORMATION PROCESSING

- Operation and management of central, decentral and local hardware and software environments according to specified performance levels in support of corporate, community and personal applications.

- Primacy for hardware/software environments supporting corporate applications rests with the Informatics Management Branch.

- Primacy for mission-oriented computing environments not included above rest with the individual sectors.

COMMUNICATIONS MANAGEMENT

- Planning, design, implementation and management of departmental data communications, including dedicated facilities, packet-switched and circuit-switched data, according to specific performance criteria.

- Primacy for the Corporate Communications Infrastructure and establishment of standards rests with the IM Branch.

- Primacy for distributed networks rests with the individual communities of interest. Integration on an individual basis within the Corporate Communications Infrastructure will depend heavily upon conformance to standards.

3.3 INFORMATION MANAGEMENT POLICIES/PROCEDURES

A committee structure exists within the Department to oversee the implementation of information management initiatives. It is depicted in the accompanying diagram.

The primary function of this structure is to ensure that all major IM initiatives are reviewed by the department executive (DM / ADM), and support the strategic objectives of the Communications and Culture program.

In addition, IM policies and procedures are reviewed for appropriateness within the specific DOC setting.

Senior Mgt Committee (SMC)

This committee, composed of DM, ADMs and key DGs, provides the overall management direction for the Department, and, in concert with the Minister, determines the strategic program objectives. This committee meets weekly, and reviews critical IM initiatives, as required, as part of its ongoing mandate.

Information Systems Steering Committee (ISSC)

This committee, composed of ADMs, and chaired by the ADM - Technology and Research, reviews all major IM initiatives, provides senior management direction on policies and procedures, and determines which IM initiatives are to be brought to the SMC. This committee meets monthly.

Strategic Project Steering Committee(s)

These committees are focused on the successful implementation of the strategic projects defined in section 8 of this report. A separate committee exists for each project that has inter-sector impact to ensure effective project management. The committee is chaired by the Director General charged with project implementation. Each committee has an ADM-level sponsor, and reports plans and progress on a regular basis to the ISSC. Accountability for successful project completion still rests with the appropriate program manager, however.

Contract Review Board (CRB)

This Board, chaired by the ADM - Corporate Management, oversees all contract awards within the Department. It is used as a vehicle to share information on major contracts among sectors, and to ensure that regional allocation of discretionary contracts is in keeping with departmental objectives. This committee meets weekly, and is a key element in the approval and issuance of IM contracts.

Within this management framework, policies and procedures for IM acquisition have been established, which include the preferred choices for Office Technology (i.e., Personal Computers, related peripherals and software), as well as a streamlined acquisition process based upon the increased delegation for significant EDP acquisitions which the Department received through its Increased Ministerial Authority and Accountability (IMAA) MOU with Treasury Board. These policies are outlined in Departmental Directives D-9 and D-32.
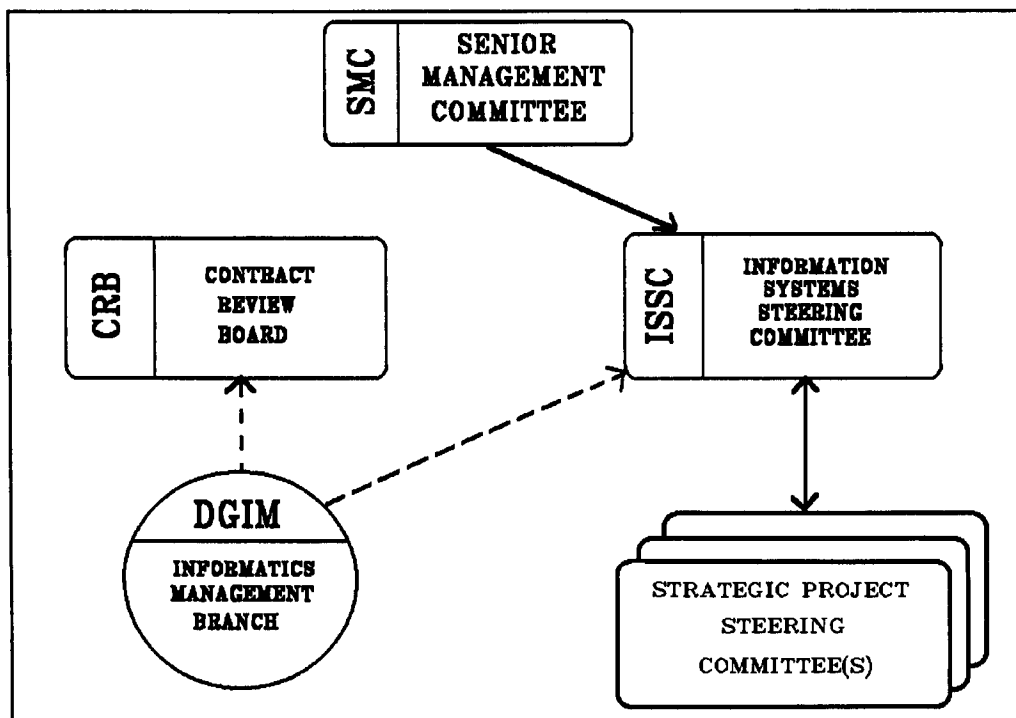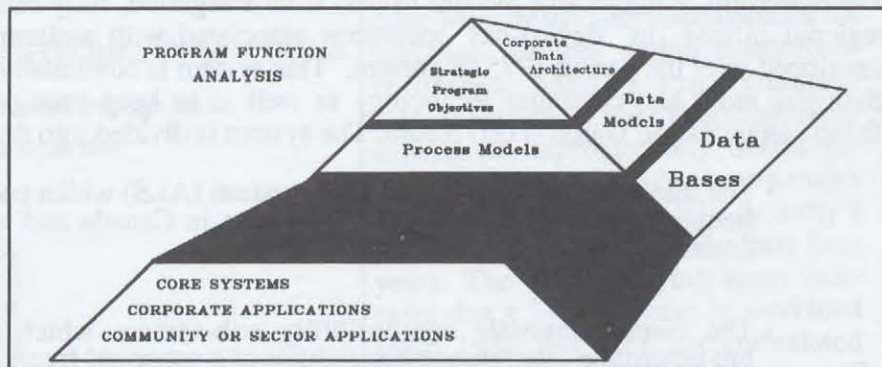
PROGRAM FUNCTION ANALYSIS

4. PROGRAM FUNCTION ANALYSIS

In analyzing the effectiveness of IM in support of the Department's mission, it is important to understand that mission.

The mission, overview, strategic objectives, thrusts of major subactivities, factors impacting results, and critical success factors are discussed in Appendix A.

The Department of Communications has varied and challenging programs that must be administered within a resource base that is shrinking in relation to the work to be done. As a result, innovative approaches to accomplish this are constantly being pursued. Information technology is central to DOC's strategy for doing more with less. Automation is critical to the delivery of many of its programs and the department has received good value for money invested in applications. Restraint has accelerated the need for more and better applications at a time when many of the existing systems are aging and require significant updating.

Different parts of the Department vary widely in terms of the degree of computer literacy, use of automation, sophistication in the use of technology, and integration among applications. The following diagram shows how well information needs of the Activities are being served, highlighting the degree of penetration of automation within the Department. The acronyms refer to the strategically significant applications discussed later.
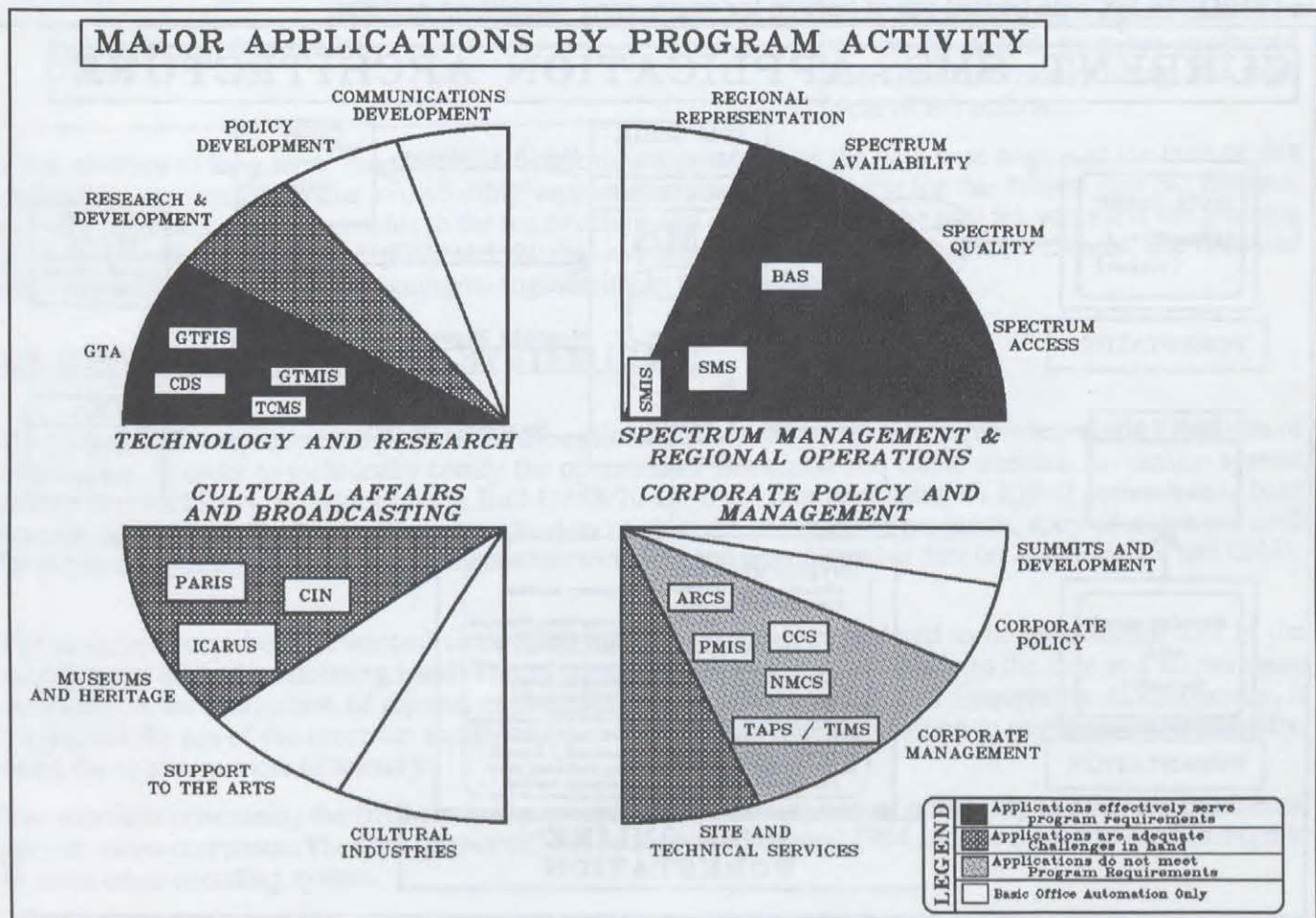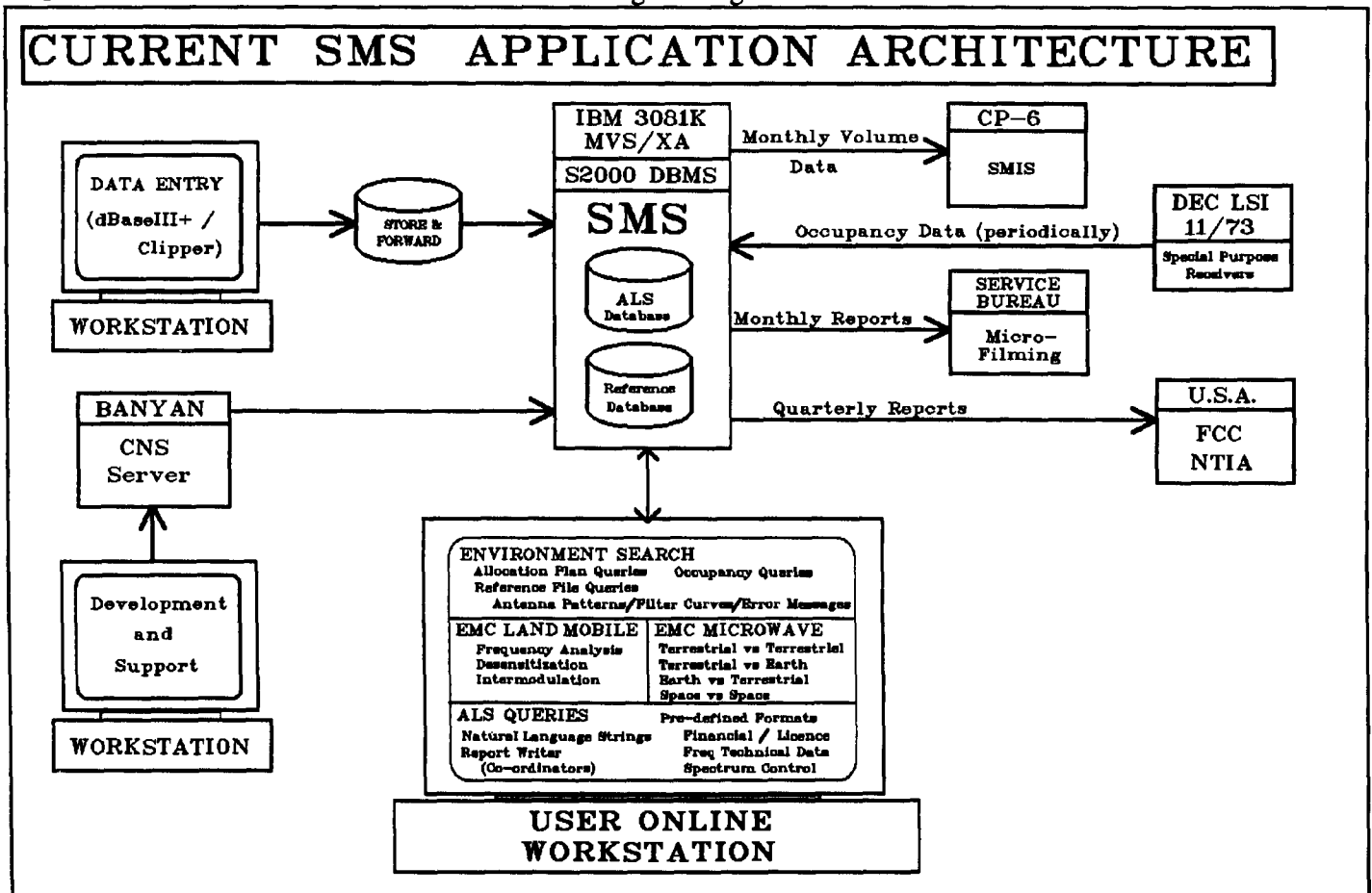
4.1 SPECTRUM MANAGEMENT SYSTEM (SMS)

The Spectrum Management System (SMS) is an integrated, fully-bilingual system to assist the district and regional offices in day-to-day operations associated with assignment and licensing workloads. It was developed over the period 1975 to present. This system is continually enhanced to meet the requirements of changing radio and computer technology as well as to keep pace with developments of the International Telecommunication Union (ITU) forum. The system is divided into three major sub-systems:

- The **assignment and licensing sub-system** (ALS) which consists of a System2000 database of all frequency assignments and radio licenses in Canada and which records revenue generated from licensing against individual license accounts.

- The **electromagnetic compatibility sub-system** which provides engineering calculations to pre-determine interference possibilities of a proposed frequency prior to its assignment.

- The **spectrum occupancy sub-system** which is a minicomputer controlled radio receiver used to collect statistics regarding radio channel usage, which data is processed and then used in the frequency assignment process.

On Line Data Entry (OLDE) is completed in each of the district, regional and headquarters offices responsible for licensing. Micro-computers are used to collect and store the data for later transmittal to the mainframe. The SMS system resides on a facilities-managed IBM3081K mainframe which operates in an IBM MVS/XA TSO environment using a System 2000 hierarchical data base management system. Communications to the mainframe by users is asynchronous via the Government Packet Network (GPN). Systems development and maintenance personnel access the mainframe via 3270 emulation over a Banyan LAN. The application is written in COBOL PLEX with limited use of Fortran for engineering calculation routines.

CURRENT SMS APPLICATION ARCHITECTURE

SPECTRUM MANAGEMENT/REGIONAL OPERATIONS

Effective Support of Mission through IM

Data Normalized to March 1985

% Change

RESOURCES & WORKLOAD

⊠ Person Years
⊟ Workload
◿ Annual Cost
■ Annual IM Expenses

Fiscal Year End
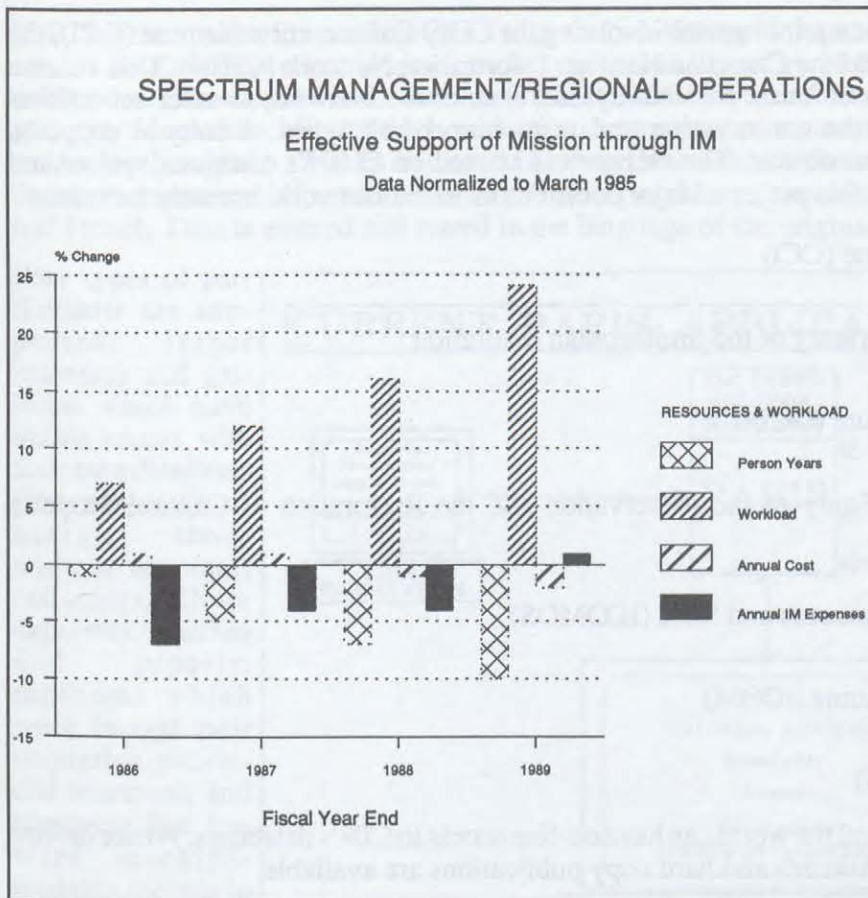
The system, which allows the sector to cope with greatly increased demand for spectrum services within constrained resources, handles approximately 200,000 accounts with financial transactions of approximately $60M for 800,000 licences.SMS has been a major factor contributing to this Activity's productivity gains over the past four years. The accompanying chart indicates that a 24% increase in workload since 1985 has been accommodated despite a decrease in person years of 10% through good management and the effective use of IM.

The facilities management contract for processing services, signed with STM and effective in July 1989, runs for three years with two optional one year periods. The contractor also guarantees to support System 2000 for the duration of the contract and calls for an upgrade to an IBM3084 Q with a concomitant increase of processing capabilities from 14 to 24 MIPS to meet projected workload increases during the third year of the contract.

In the medium to long term, the system is facing the replacement of the data base engine at the core of this application (System 2000) due to dwindling support from the manufacturer for this fifteen year old product. With the increases and amendments to the fee structure and schedules over the past ten years and the growing demand from the clientele for quick and reliable explanations for their billings and charges, the financial sub-system will also need re-designing/re-engineering in the near future.

4.2 BROADCAST ANALYSIS SYSTEM (BAS)

The purpose of the system is to provide for the optimum use of the broadcast frequencies with a minimum of interference, in order to technically certify the operation of Broadcast and Cable stations. An on-line system written in FORTRAN, it resides on the Bull DPS8/70 CP-6 environment using an IDS-II network data base management system. BAS includes two major data bases and a multitude of programs, sixty of which are used for engineering analysis. Both data bases contain technical and administrative data on AM, FM, TV and Cable.

The programs have been developed since 1969 and the system is considered to be an essential tool in the management of the broadcasting band. The system provides better accessibility to the data and allows more flexibility in the production of reports, engineering analysis and allotment of frequencies. Consequently, it maximizes the use of the spectrum locally and places Canada in a better position to negotiate internationally, using the spectrum more efficiently.

The shortfalls concerning the BAS are its slow response time and its lack of portability to other environments, such as micro-computers.The CP6 system will not be supported beyond 1994 and the BAS will need to migrate to some other operating system.

4.3 CONSERVATION INFORMATION NETWORK (CIN)

The Conservation Information Network is a joint venture involving the Getty Conservation Institute (GCI), the Canadian Conservation Institute (CCI) and the Canadian Heritage Information Network (CHIN). This venture brings together the resources of the conservation community and enables the Network to offer subscribers comprehensive information relating to the conservation and restoration of all types of cultural property, including sites, architecture, and museum objects. The Network is housed on CHIN's computer system and CHIN provides the technical support for this project. Major contributors to the Network currently include:

- Canadian Conservation Institute (CCI)

- Conservation Analytical Laboratory of the Smithsonian Institution

- The Getty Conservation Institute (GCI)

- International Centre for the Study of the preservation and the Restoration of Cultural Property (ICCROM)

- International Council on Monuments and Sites (ICOMOS)

- International Council of Museums (ICOM)

- National Archives (PHOCUS)

Subscribers in twenty-two countries around the world can have on-line access to CIN's databases. Where on-line access is not available, information on diskettes and hard copy publications are available.

The Conservation Bibliography Database provides subscribers with access to approximately 120,000 citations from the international conservation literature including books, technical reports, and conference proceedings. The Conservation Materials Database contains information on the products relevant to conservation practice. There are currently four major categories of information: adhesives, consolidants, coatings, and pesticides. The Product/Supplier Directory database provides information on international manufacturers, distributers and retailers of materials used in conservation. The electronic mail system, a supplement to the databases, is available to all subscribers 24 hours a day.

English is currently the language of operation and the language of most information contained in the Network. In future, the Users Guide, the Data Dictionary and the operating software will be provided in French. Eventual expansion into other languages will also be considered to facilitate access for subscribers whose primary working language is not English.

CIN provides information that has never before been available in a single location or in a standard format. Additional benefits to subscribers include online consultation with colleagues in any geographic location by electronic mail and the ability to down load information from the Network for local personal use. The advent of CIN has significantly increased the information available to Canadian museums.

4.4 PARIS (Pictorial and Artifact Retrieval and Information System)

PARIS is the application used by CHIN to assist in fulfilling its mandate in providing a collections management service for Canadian client institutions and a national inventory of Canadian humanities and natural sciences collections. Currently, PARIS runs on a CYBER 180/850A mainframe using the BASIS data base management package. More than 140 terminals and microcomputers are connected to the CYBER via DATAPAC, GPN and/or local nodes in 17 cities in Canada linking Canadian museums together to facilitate the management of their collections and information sharing. PARIS provides commands, messages and documentation in English and French. Data is entered and stored in the language of the originator.

Four types of participants are supported: larger museums and galleries which have online access with their own databases (the majority of users); those without terminals and using CHIN for data entry, searches and reports; museums which work through their respective provincial museums; and museums that forward machine-readable records to be entered by CHIN but have online retrieval.

CURRENT PARIS APPLICATION ARCHITECTURE
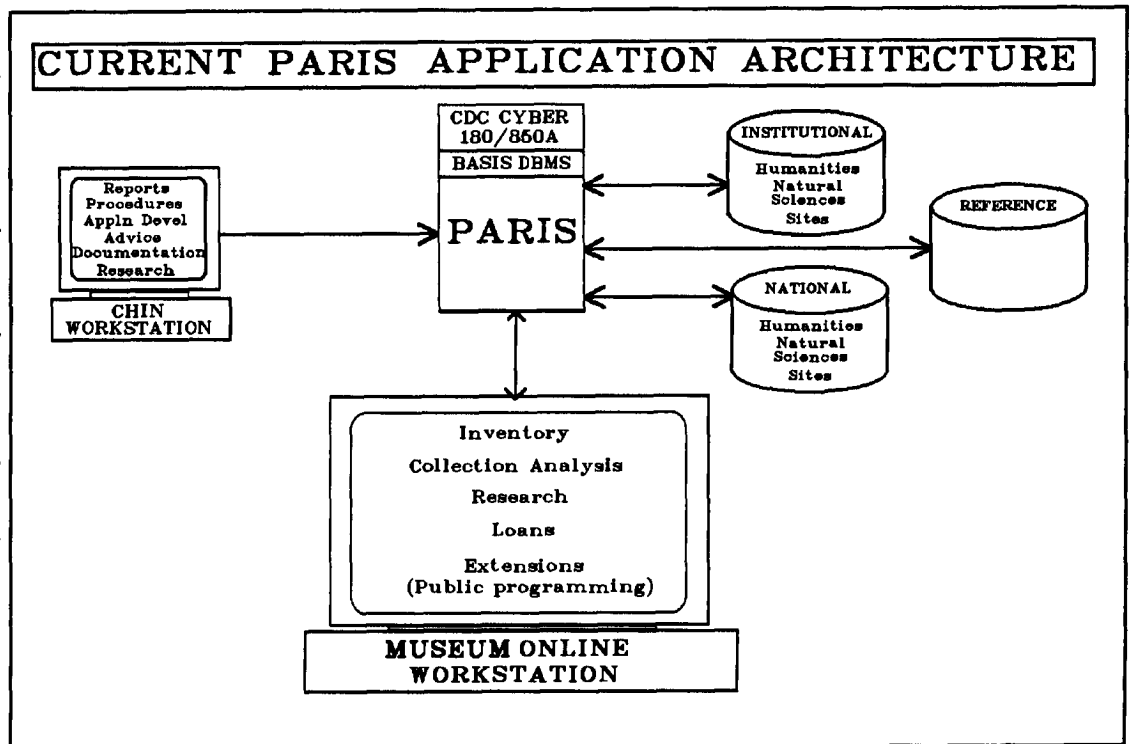
Paris is used by almost 1500 museum staff on a regular basis. Two thirds of the client museums report that they use the system for inventory, collection analysis and research. One fifth use the system for loans, while one in ten use Paris for tracing thefts and extension work.

CHIN offers different types of databases - institutional data bases to assist the museums in managing their collections, national data bases which together are an inventory of Canada's collections, and reference data bases which provide non-collections based information to the museum community. In total the system stores 5.5 million records in 114 databases from over 150 institutions.

Supporting collections management ensures the accuracy and timeliness of information. As well, standards are created to make the data usable for information exchange. The system permits easy access to other databases for research without the cost of travelling or duplicating research effort - this is important in times of low funding. Yet, the system provides security where required.

Current issues facing CHIN include the need to broaden access to more users and more reference data bases and to provide new services to clients. Due to changes in technology and changing client needs, an analysis of text based data base management software will be carried out to find a product to carry CHIN and its clients into the 90's.

GTA shares a facilities management contract (STM) with the Spectrum Management activity. With few exceptions, all GTA applications reside on an IBM 3081K which operates on the MVS/2.2 using a DATACOM relational data base management system and IDEAL as a fourth generation language.

CURRENT GTA APPLICATION ARCHITECTURE
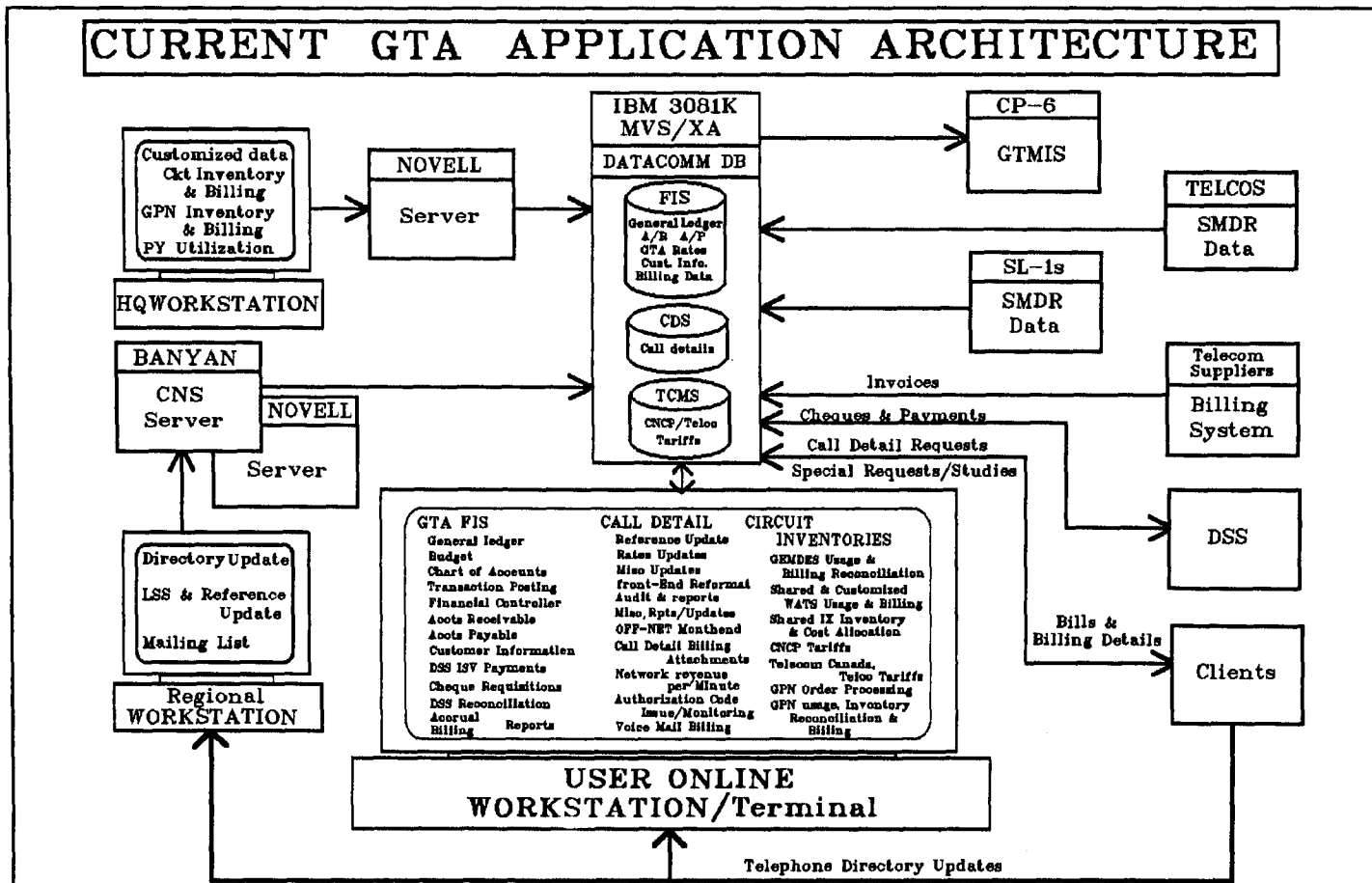
GTA FINANCIAL INFORMATION SYSTEM (GTAFIS)

GTA-FIS includes the Management Science America (MSA) General Ledger, Accounts Receivable and Accounts Payable software packages and a separate Billing System. The MSA GL and AR are versions that are interfaced to the DATACOM/DB database management system.

The MSA Accounts Payable module has been installed and is scheduled to be implemented between April 1990 and the end of November 1990. The MSA Receiver General Interface must be acquired in order to integrate the AP with DSS's cheque issuing system. An interface already exists between DSS's central accounting system and the GTA Accounts Receivable system. This application extracts Inter Departmental Settlement Notices (ISNs) and applies these payments against GTA's Accounts Receivable.

The Billing System was developed using the fourth generation language IDEAL with all data being held in DATACOM/DB databases. It is used to issue approximately 90,000 invoices annually. The Billing System receives input from many of GTA's Usage Measurement and Circuit Inventory applications. Some of this input is automated while much of it is still manual. The Billing System also provides transactions files for posting to the Accounts Receivable and General Ledger.

The GTA-FIS General Ledger module also receives data on salary accruals from a person year utilization system and actual salaries from data extracted from the DSS salary tape provided to the Department. GTA is currently in the process of upgrading the MSA GL and AR to the most recent releases of these products and converting to the Virtual Sequential Access Method (VSAM) versions from DATACOM/DB versions.

GTA CALL DETAIL SYSTEM (CDS)

The Call Detail Reporting System is a multi-faceted processing and reporting system which allows GTA to cost all calls made on the Government Intercity Telephone Network. Raw data on calls is collected by all telephone companies providing Local Shared Service and by a service bureau which specializing in collecting the data from PABXs. The telephone companies and special service bureau perform some downstream processing on the raw data from fifty nine different switches across Canada. They then ship the data on magnetic tape to GTA.

GTA processes approximately 9,500,000 call records per month and reports on 4,250,000 revenue calls per month. Each call record has the source and destination identified, the trunk facility used, the start date and time of the call, the duration of the call and the charges associated with the call calculated using GTA per minute rates. This application produces call detail reports which are mailed to client departments and billing information which is input to the Billing System for invoicing clients. Traffic figures and network revenue minutes are input to a network revenue model and a network management system to assist GTA in rate setting and optimizing the configuration of its network.

These applications are written in COBOL with reporting done using EASYTRIEVE PLUS.

GTA TELECOMMUNICATION CIRCUIT MANAGEMENT SYSTEM

The Telecommunications Circuit Management System includes a number of applications written in IDEAL and dBaseIII+ which are used to keep an inventory of circuits and facilities both in GTA's shared and customized services portfolios. The systems are used to reconcile the carriers' invoices and to calculate charges to clients for these services and to allocate costs for GTA's shared voice network to the various consolidations operated by the Agency

GOVERNMENT TELECOMMUNICATIONS AGENCY

Effective Support of Mission through IM
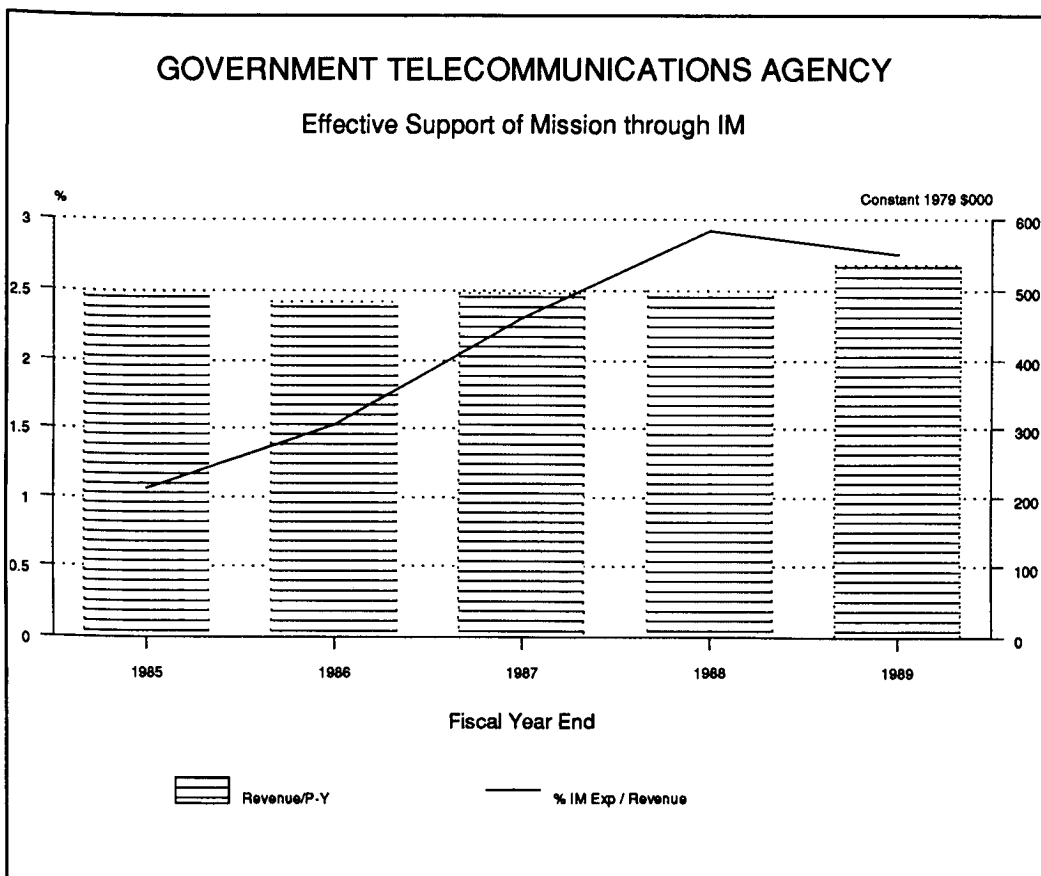
The accompanying chart illustrates the ever-increasing proportion of GTA revenue reinvested in Information Technology from 1985/86 through 1988/89. This has been necessary to not only sustain revenue growth per person-year, but also to ensure a longer term information processing capability within the agency.

The success of this strategy is evidence by the drop in IT as a percentage of revenue in 1988/89 while revenue per person-year rose higher than previous year trends.

GTA will continue to invest in IM to ensure future revenue growth.

4.6 TECHNOLOGY AND RESEARCH SYSTEMS

OFFICE AUTOMATION RESEARCH

The informatics environment at the Canadian Workplace Automation Research Center (CWARC) is a highly interconnected infrastructure available to all groups to support R&D and administrative needs. This environment has been regularly upgraded and enhanced to meet evolving requirements with rationalization of the SUN R&D infrastructure currently underway. One major piece, the SL-1 PBX, is becoming old and will have to be replaced in the near future.

In addition, CWARC has a Hewlett-Packard HP3000XE for its Integrated System for Information Services, ISIR. This system is used at CWARC to access monograph, conference and research reports, articles from periodicals published in Flash Information, the bibliography compiled by researchers and the management of other corporate administrative documents. This system was implemented in 1987 and already contains over 75,000 records. Access from headquarters library has recently been provided and is also planned for CRC. The issue facing the system is that its use within the department cannot be extended due to the limitations of the current hardware platform.

COMMUNICATIONS RESEARCH

Software systems are used in support of approved communications research projects - some of which are funded entirely by client Departments or Agencies such as DND, CRAD, & CSE. These systems consist of many programs and modules and some are continually undergoing modification, adaptation and augmentation in keeping with research project requirements and developments in the communication technologies. These systems are used by researchers, scientists & engineers and their support contractors from industry and involve the management and maintenance of large data bases. The major systems are depicted below:
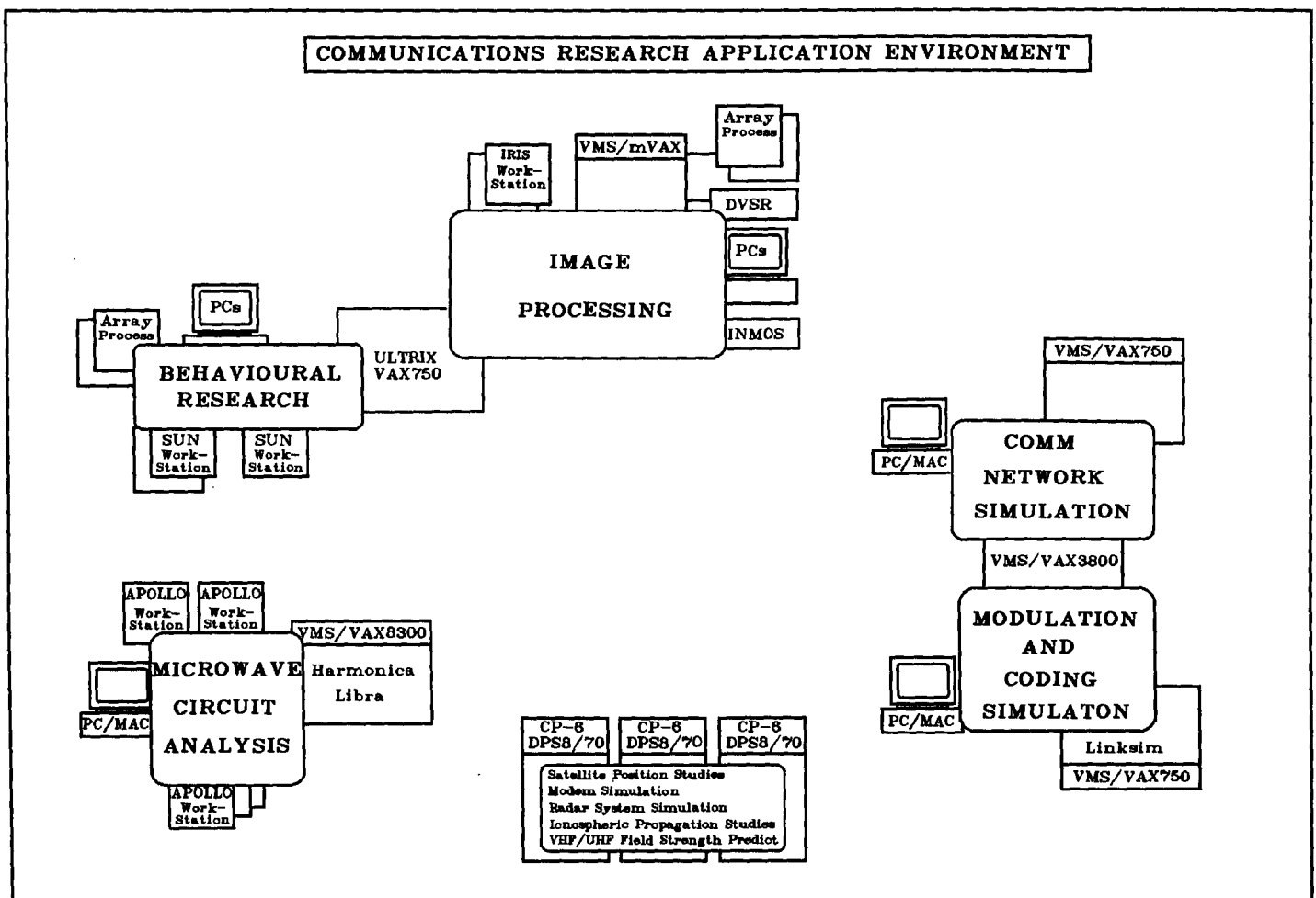
COMMUNICATIONS RESEARCH APPLICATION ENVIRONMENT

Communication Network Simulation

This application was developed to support research into radio communication network performance, protocols, connectivity and interoperability. It is a discrete event simulation written in Modula 2 running under VMS. Simulation setup, execution, and post-processing take many hours, often days, per simulation run. Such long execution combined with an inadequate user interface severely limits the utility of this system and the number of runs that can be performed. A more powerful platform with a vector processing capability and friendly graphical interface would significantly benefit this research work.

Modulation & Coding Simulation

Linksim was developed to support Modulation & Coding Simulation. It is a large flexible VMS FORTRAN simulation package used to evaluate modulation and coding schemes for use in fading channel environments (mobile and satellite-mobile). It is currently being used to develop the Canadian MSAT system. Results from Linksim were used to establish the modulations schemes that have been accepted as the international standards for aeronautical-satellite applications and are used as a baseline to compare with the performance of prototype equipment developed in the lab. Linksim is currently resident on the VAX 750 which is adequate for gathering results at high bit error rates. However, low bit error rate results cannot be obtained because the required run-times are unreasonably long, and this limitation impacts the effectiveness of the research being performed. A more powerful platform with vector processing capability is required.

Behavioural Research

This research examines the human-factors issues of new communications technologies, such as the large-scale statistical analysis of bodies of text in the design of interactive service technologies for new interactive media systems. Development of speech recognition systems, HDTV research and digital sound broadcasting and multi-channel sound system research could all benefit from high-speed access to large-scale data storage as well as high speed real-time array processing.

Image Processing

The primary thrust of image processing is the electronic capture of images and the compression of data for transmission and storage. The work done permits DOC to input to Canadian standards and to international standards committees. In addition, industry is helped in the use of applications (eg. a real estate firm can retrieve both text and images of properties to be sold). Software for most research applications is developed in-house. The extensive complement of equipment in use is barely adequate to perform the image analysis and manipulation required, significantly impacting project productivity.

Microwave Circuit Analysis

The Microwave Circuit Analysis System is a scientific/engineering application for the analysis of linear and non-linear, active and passive circuits. Two software packages are employed in the circuit analyses, Harmonica and Libra, and represent an investment of $250K. Both packages run on a DEC VAX 8300 under VMS. In the course of a year, 20-40 circuits may be analyzed. While the system permits the design of more complex and accurate circuits than the traditional paper-based analysis, even a mechanized design analysis may take several weeks, with only one circuit done at a time. Vector processing power coupled with increased processing capacity would greatly reduce the elapsed time of the analyses and result in more effective circuit design research.

Other Major Applications

Satellite Position Studies, Modem Simulation, Radar System Simulation, Ionospheric Propagation Studies and VHF/UHF Field Strength Prediction are among the more significant applications running on the in-house mainframe Bull DPS8/70 CP6 computer. The major issue confronting these applications is the impending termination of support for the Bull CP-6 operating system. Facilities are currently not available within the Department to receive these applications. In addition the cost of migrating these systems is beyond the financial capacity of the department to absorb.

4.7 ALLOTMENT REPORTING AND CONTROL SYSTEM (ARCS)

ARCS was designed to be the principal departmental financial system to satisfy parliamentary and managerial requirements for financial visability, accountability and control. ARCS features on-line input, edit, update, access and reporting. The update routine includes funds control, free balance monitoring, outstanding account status (eg. hard commitments) and update of vendor records.

CURRENT ARCS APPLICATION ARCHITECTURE
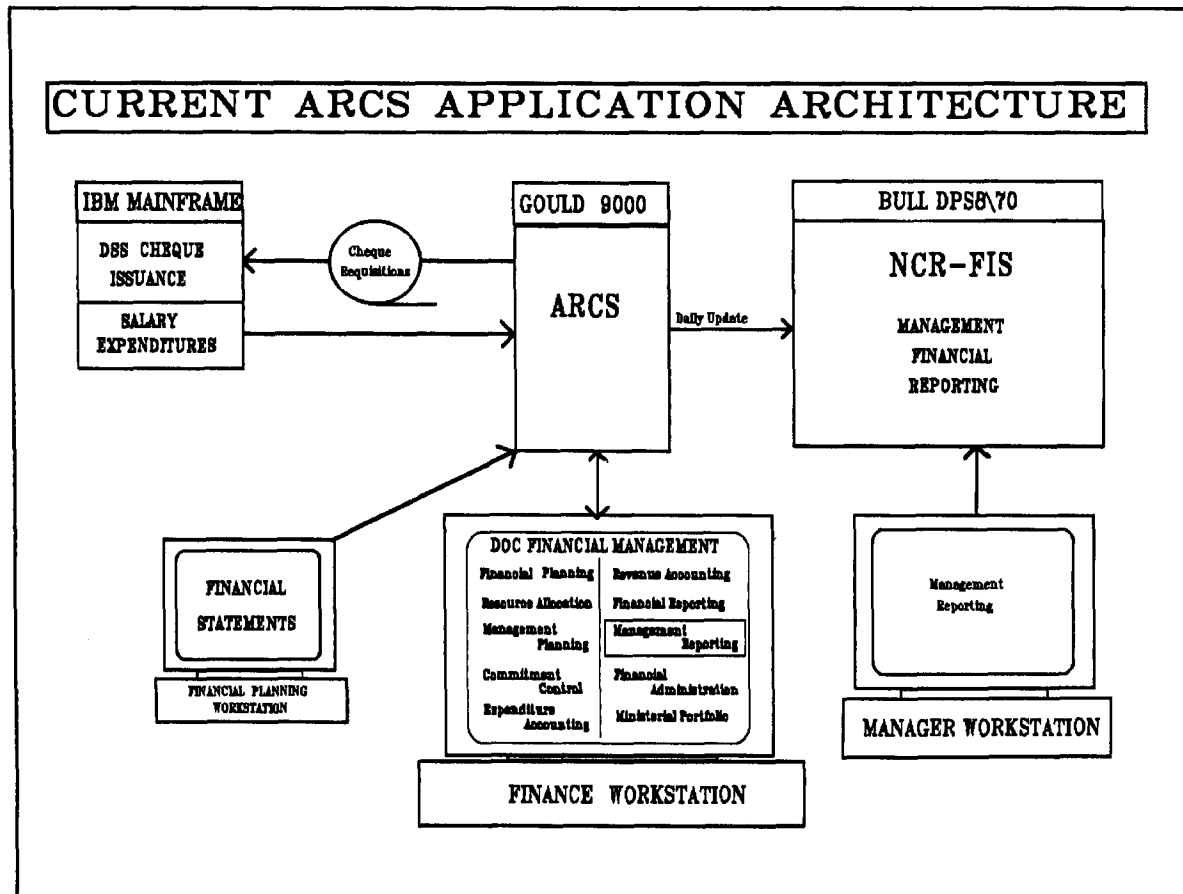
Performance problems, however, have restricted the use of ARCS to those entering financial data on-line and other selected users.

Therefore, overnight batching is used to update the NCR-FIS and it continues to be accessible to all Responsibility Center managers for reports and on-line query modules.

ARCS provides other features over the older NCR-FIS system. It permits changes to the departmental financial coding structure; it permits variable and multi-level expenditure, cash and commitment control; separate control of allotments and management budgets; and permits control by account types, e.g., commitments, advances, holdbacks and multi-year. In addition, the relational database permits a powerful query by form and ad hoc reports using SQL.

The implementation of ARCS has not necessarily reduced work at this point in time, However, the implementation of ARCS has encouraged a larger number of financial staff to move into the computer era. They are now comfortable with online entry of data.The knowledge so gained will permit better definition of user requirements for future enhancements and will likely result in greater operational efficiency.

The principal challenges facing ARCS are:

- The extension of access to financial information to managers within the department, and

- Ongoing functional enhancement on a processing platform that cannot support growth

In addition, as with all core management systems, a new relational database management system that can support both transaction processing and relational (SQL) reporting for the longer term is required.

4.8 SPECTRUM MANAGEMENT INFORMATION SYSTEM (SMIS)

SMIS is the system used to collect and report data on human resources to the Spectrum Management and Regional Operations Sector (ADMSR). It is a tool to assist managers in effective planning, allocating and controlling resources in the light of current and projected work loads that are necessary in meeting the basic objectives of Communication Canada.

It also provides a standard approach for the evaluation and measurement of performance within the Sector. SMIS consolidates the management information system storage and reporting requirements previously encompassed in the Regional Operations Management Information System (ROMIS) and the Headquarters Management Information System (HQSMIS). ROMIS was put in production in 1980.

The SMIS system resides on DPS8/70, operates in a Bull CP6 environment using the ARES relational data base management system. The ADAPT and IBEX products are used to create an on-line menu driven user interface for the main options. The application is written in Cobol-85 using the ARES application program interface (API) which is SQL-like in its syntax and function. Access is via the GPN using asynchronous communications with a variety of terminal emulations for screen handling. Data entry is of the store-and-forward type using IBM PC compatible micro-computers and dBase III plus software. Reports and raw data are available for downloading.

CURRENT SMIS APPLICATION ARCHITECTURE
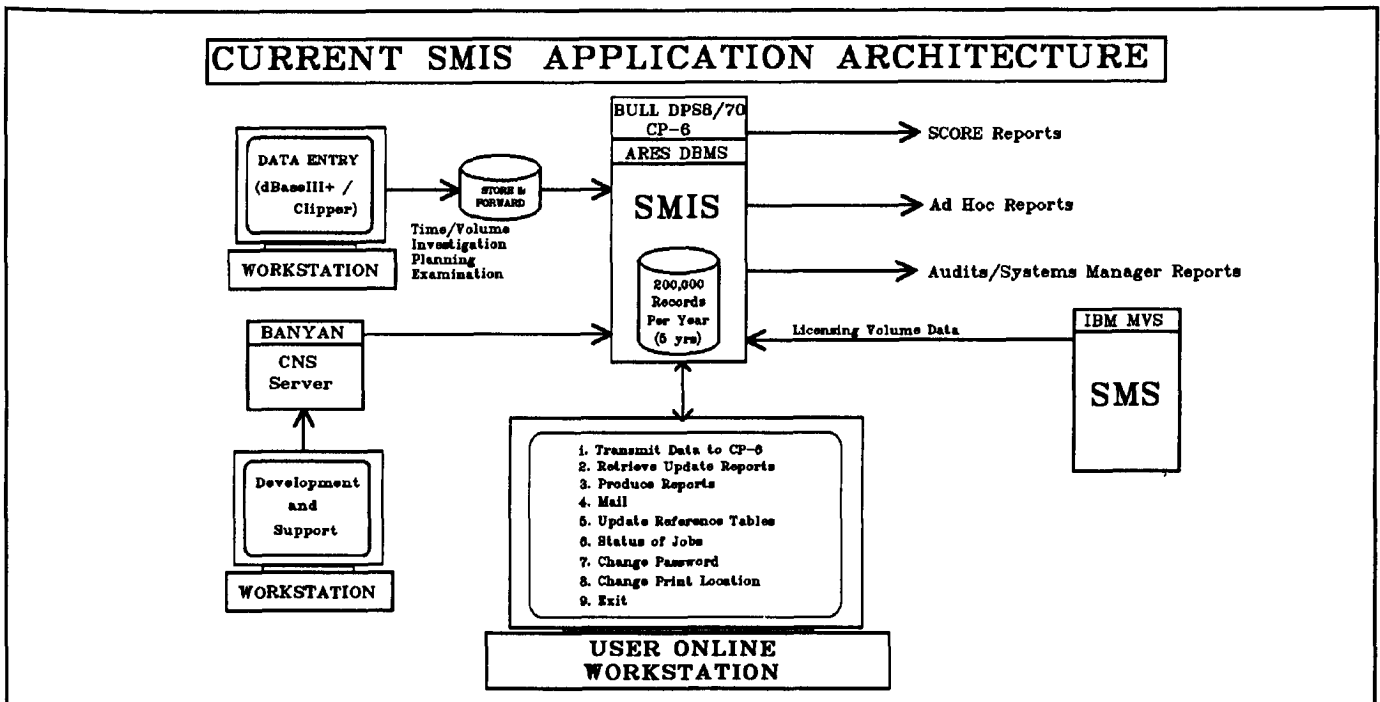
Approximately 200,000 different types of records are processed yearly on the system, in addition to the five years of data that are kept for the production of reports providing multi-year comparisons. Users located across Canada have access to the system for data entry and production of output reports. A LAN is presently being used in headquarters for data entry. The system provides reports for any fiscal period or up to the day it is requested in the language of the user's choice. The user may also obtain customized reports and query the database on specific items.

The SMIS interfaces with the SMS system, the Examination Systems (SYSEXAM) and other administrative system such as the preparation of operations plans, in order to reduce duplication of data entry. SMIS will also interface with the Spectrum Control Operations Management System (SCOMS). The application is considered to be of strategic importance to the sector and its continued availability is critical.

Since the CP6 operating system will no longer be maintained after 1994, another platform will need to be selected for migration. Different options are being examined, but given the mission nature of this system, there is a rationale to consider locating it on the same machine as the SMS.

4.9 CORRESPONDENCE CONTROL SYSTEM (CCS)

Communications Canada's Correspondence Control System (CCS) provides for the logging, tracking and reporting on correspondence relating to the offices of the Minister, Deputy Minister and the ADM's. It also acts as a Bring Forward (BF) system for the control of correspondence among these offices. The system is under the control of the Executive Correspondence Unit. There are about 300 transactions applied daily. There are approximately 400,000 entries on file representing two and a half years' activity. The CCS operates on a Gould 6040 computer with a Secure UNIX operating System.

System strengths include easy access to the tracking features, appropriately categorized correspondence, straightforward distribution of items, easily identified campaign mail, adequate control of correspondence , and simple and quick ad hoc reporting capability. Shortfalls include the inability to capture the correspondence received, absence of direct response generation, a unilingual English interface, slow responses to keyword and date searches, lack of user-friendliness, limited vendor support, lack of capacity to extend system across the department, and absence of contingency facilities.

4.10 HUMAN RESOURCES MANAGEMENT (PMIS)

There is no Departmental Personnel Management Information System. The Department uses the DSS DPMS (formerly PARS) and On-Line Pay systems, Treasury Board's Official Languages Information System (OLIS), and an internal system, the Personnel Monthly Activity Report (PMAR) which produces very cumbersome reports from which information is difficult to draw. Manual processes have been added to produce the required data.

Information on some 3,200 positions and 2,500 employees is maintained on these systems. $90,000 per annum is spent on the DPMS system and an additional $12,000 is spent on OLIS. The Pay and Benefits section has accumulated a backlog in excess of 2,000 transactions over the past year, in addition to specific projects such as Canada Savings Bonds and United Way.

External personnel systems are working against the productivity of DOC staff as much as they help. They are characterized by unreliable and conflicting data, inflexible and untimely reporting, and inadequate equipment. Outputs from the DPMS and from OLIS are unreliable and must be reconciled prior to presentation. Furthermore, DSS will not support the current DPMS system beyond March 1991.

The most urgent concerns at this time are to eliminate the pay and benefits backlog for on-line pay, provide for the replacement DPMS, help with cumbersome manual processes such as mail logs, BFs, tracking of overpayments, Conflicts of Interest, and modify the in-house CP6 system for PMAR (Personnel Monthly Activity Report). Ultimately, an integrated Personnel Management Information System will be required that will interface smoothly with the department's financial system and other external systems.

4.11 DEPARTMENTAL ADMINISTRATION

The National Materiel Control System (NMCS) is the major administrative corporate system. It captures information on the Department's assets and provides management information on those assets. The NMCS system contains approximately 85,000 records with about 50-75 transactions per day. The Departmental value of assets controlled by this system is about $ 129 million.

The system, developed in 1981, provides for the recording and control on all accountable items, identifying locations, account holders, commodity types, quantity, value, etc. Although it is efficient and useful for capturing this data and for managing assets, among its weaknesses are that it does not capture descriptive data very effectively and that searches on non-key fields provide very slow responses. Although managers can access the system in read only mode, they cannot make effective use of the NMCS because of its limitation to assets-type information. For example, equipment configuration information on microcomputers is incorporated in the descriptive field but it is incomplete and difficult to access. In addition, there are no links to the financial processes in the Department.

4.12 OFFICE SYSTEMS

Office technology has been in use within DOC since the Office Communications System trial in 1982. The principal microcomputer technology is based upon the MS-DOS operating system,ranging from the lowest level (4.77 MHz PCs) to the latest technology (386-based 20 MHz PCs). Apple MACs are in strong use within the research sector of the Department, and represent about 10% of all microcomputers.

A variety of networking technologies are employed to interconnect these machines, however, they center mainly on Banyan and Novell, with Apple microcomputers interconnected via Appletalk and TOPS networks.

The most commonly-used PC-based tools are Wordperfect and Lotus 1-2-3.

The key strength in the office system area is the relatively deep penetration of PCs within the organization. The implementation of the Executive Information System, which is based upon a graphical user interface employing 386-level machines and MS-Windows will set the tone for the rollout of enhanced office workstation platforms in the future.

The key challenge to be addressed in the office systems area is the interconnection and interoperability and support of this base of technology. These issues will be addressed later in this report, but a critical indicator of success will be the establishment of a common electronic mail solution for the Department as the first step in an overall integrated office system strategy.

4.13 CONCLUSIONS

The department must continue to develop and maintain automated systems in order to conduct its business as effectively as possible in a period of continuing restraint and to maintain the same level of service to its clients. DOC has displayed a history of cost effective use of automation, a tradition of innovation, including initiatives such as the Ship Advisor expert system and the Executive Information System (EIS) , and effective use of emerging micro-computer capabilities.

As the majority of the department's IM expenditures serve to support the existing base of applications, there is little flexibility for significant new development. Some economies will be gained through the consolidation of existing platforms, as outlined later in this report but the following challenges will remain:

- enhancement of corporate management core applications utilizing a common architecture to ensure effective information management

- selection of a relational database management system for general purpose applications that will support both transaction processing and standard SQL access

- implementation of department-wide correspondence control system with both the breadth and depth to serve the information needs of all organizational levels

- continued evolution of existing applications to meet future needs with a limited resource base

- development of a department-wide integrated office system

- intensified training and support demands with the increased utilization of local office systems

INFORMATION RESOURCE MANAGEMENT ANALYSIS

5. INFORMATION RESOURCE MANAGEMENT ANALYSIS

The need to manage information as a vital resource is sweeping across the government and private sectors. Information to gain competitive advantage is a recognized weapon in private enterprise. In the same vein, effective management of government information holdings results to better quality decisions, more informed policies, and heightened service to the public.

The Department has recognized the need to evolve towards an Information Resource Management (IRM) approach that covers both manual and mechanized information for a variety of reasons:

- users and information processing specialists have realized that traditional automation practices have not provided the panacea originally anticipated;

- far too often, there is inconsistent and unreliable information, resulting in duplication of effort and lack of timeliness for decision-making;

- information cannot be easily accessed, extracted, integrated and/or summarized in the form often required by users and management;

- the lack of data integration makes accessibility to information, with its potential productivity gains, difficult if not impossible to attain;

An overview of the information retrieval process within the department yields the following:
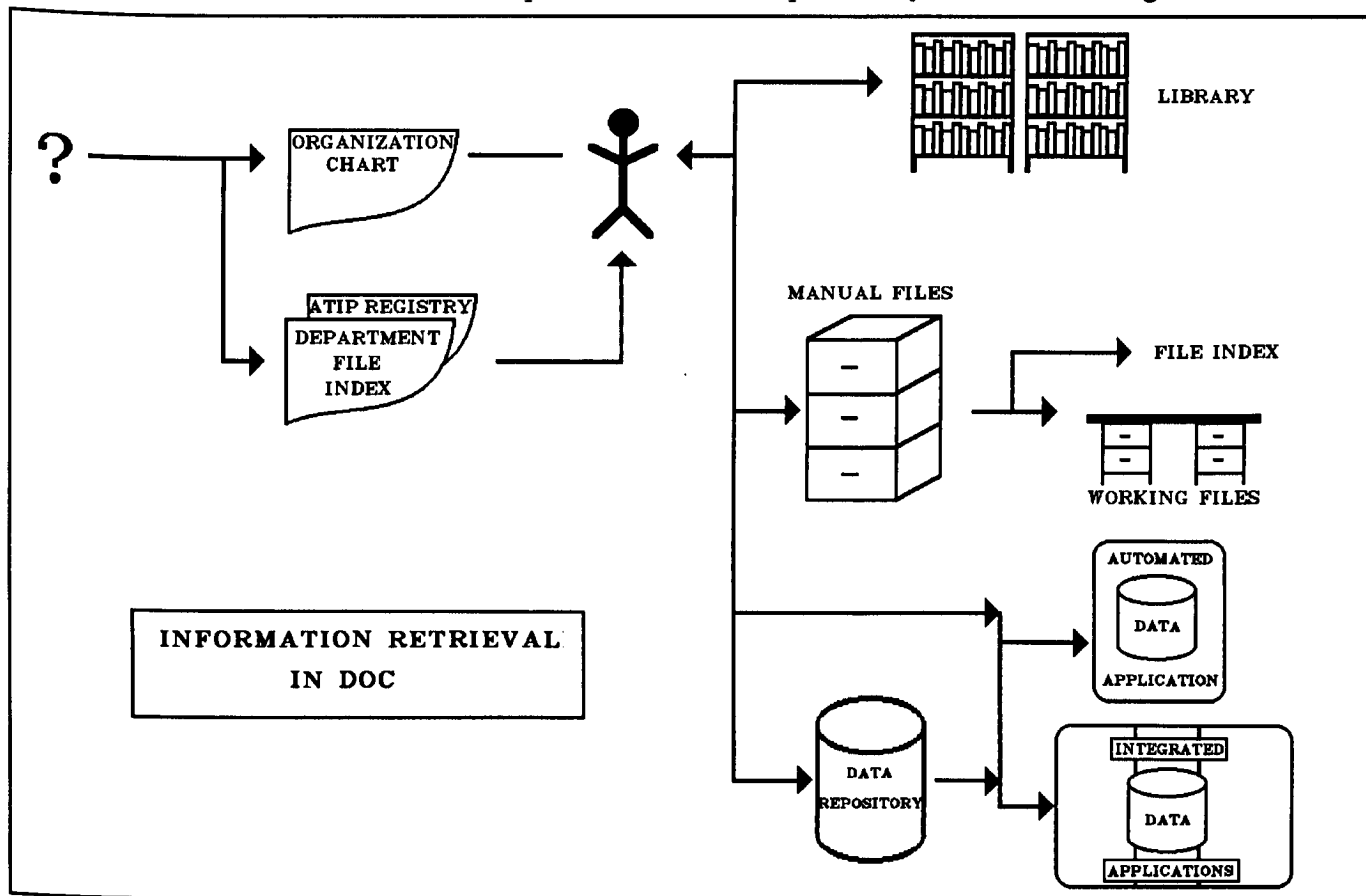
5. INFORMATION RESOURCE MANAGEMENT ANALYSIS (Cont'd)

The chief methods of cataloguing and managing information consist of:

- A decentralized departmental File Index used to manage manual records

- A registry of information holdings used to support Access to Information/Privacy Requests

- A library service that catalogues books, periodicals, papers, etc.

- Various repositories and data dictionaries used to record data on automated information

Manual and automated systems are in place to handle most predictable information needs. Most automated data bases in the Department are application specific with considerable redundancy of data. In some areas, progress has been made in sharing information and eliminating redundancies. For example, Spectrum Management applications consist of many different programs all accessing the same integrated data bases.

Where the need for information arises in an unpredictable form, such as policy issues, Ministerial correspondence, or ATIP requests, individual memory remains the critical point of access.

Formal Information Resource Modeling attempts to alleviate the dependence on individuals by providing alternative means of locating and understanding data.

A pilot project in formal Information Resource Modeling was completed for the Spectrum Management and Regional Operations activity during FY 88-89. Information classes and business processes were identified and charted. Information was tracked between various parts of the sector according to business processes in which it engages. Business process outputs were tracked as they become others' inputs, and thus, information use and information creation were mapped across the "business" within the organization.

The pilot demonstrated that an IRM approach is essential to building subject databases as the foundation for integrated and efficient systems development and maintenance. Strategies to extend this experience to address the major issue of information holdings management across the department are addressed in Section 8 of this report.

INFORMATION PROCESSING ANALYSIS

6.1 ANALYSIS OF IT EXPENDITURES

The Department of Communications has evolved a diverse information processing environment, serving both the requirements of information technology and information management, as well as in the fulfillment of the scientific research activity of the Communications and Culture progam.

INFORMATION PROCESSING ARCHITECTURE

IT INVESTMENTS

ENVIRONMENTAL ANALYSIS

Strategic IT Planning

OSI Corporate Network Architecture

Central/ Decentr. Env.

Shared Facilities Implementation / Management

Corporate Backbone Network

Local Env.

Dedicated / Local Facilities Implementation / Management

Special Purpose and Local Area Networks
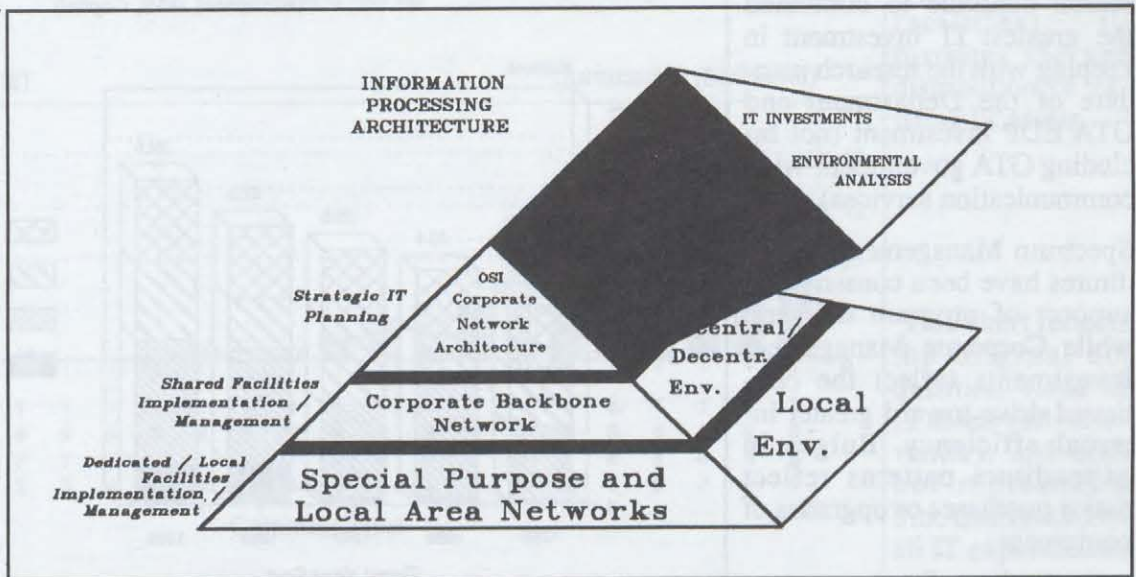
Expenditures in the scientific/research area have been tied to specific subactivities or projects, while general purpose information technology expenditures have centered on the mechanization of Spectrum Management, GTA and CHIN program activities, as well as initiatives to improve operational efficiency through mechanization of administrative functions. In addition, deployment of personal computers in recent years has shifted a good portion of previously centralized processing to a Local Area Network environment.

DEPARTMENT OF COMMUNICATIONS

IT Expenditure Summary

$Millions

8.2	8.9	9.5	9.2	9.9
20.5	23.5	25.5	27.9	32.6
1985	1986	1987	1988	1989

Fiscal Year End

—✕— % IT:Total Expense
▨ Capital
▨ Goods and Services
■ Personnel
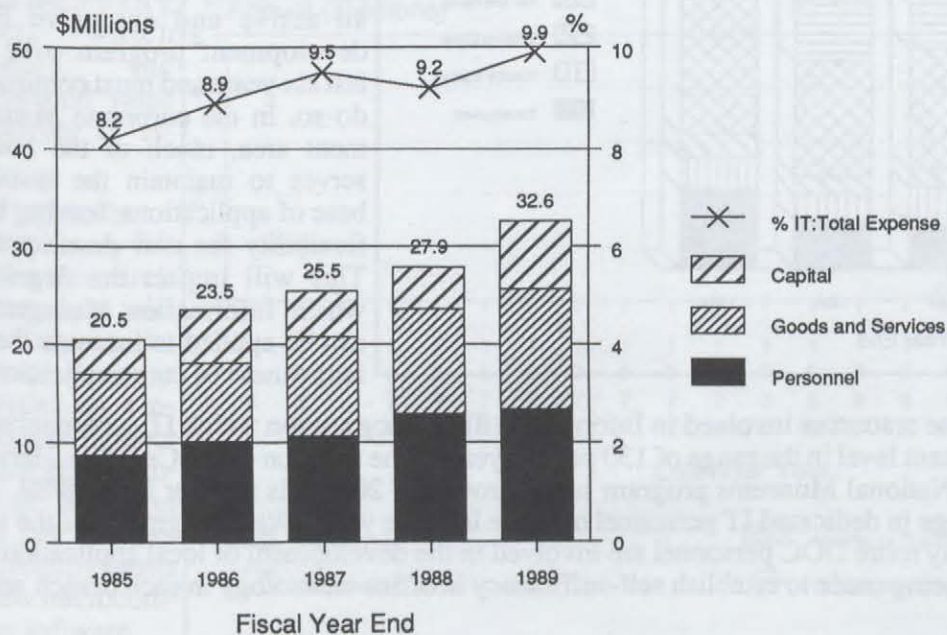
IT expenditures have grown in absolute value over time, and also represent an increasing component of total program expenditures. This pattern exhibits the necessity to invest in information technology to realize efficiency gains that enable diminished resources to cope with increasing workload. The accompanying chart illustrates the IT expense pattern as it relates to personnel, goods and services, and capital expenditures.

A closer examination of expenditures by program activity shows that Technology and Research continue to command the greatest IT investment in keeping with the research mandate of the Department and GTA EDP investment (not including GTA government-wide communication services) .

Spectrum Management expenditures have been consistent in support of program delivery, while Corporate Management investments reflect the continued drive toward greater internal efficiency. Bulges in expenditure patterns reflect major purchases or upgrades of equipment

DEPARTMENT OF COMMUNICATIONS
IT Expenditure by Activity
(Personnel, G&S, Capital)

$Millions

Spectrum & Regions
Corp Policy & Mgmt
Technology/Research
Culture & Broadcast

1985 1986 1987 1988 1989

20.5 23.4 25.5 27.9 32.5

Fiscal Year End
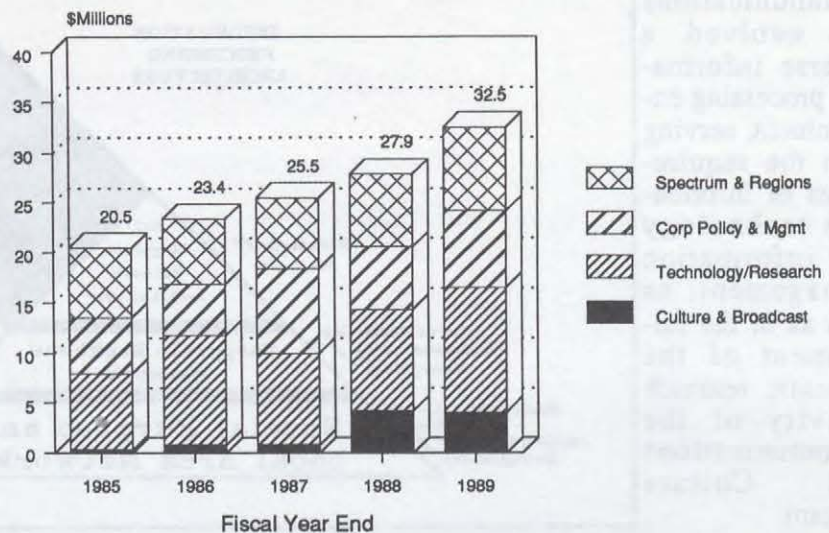
DEPARTMENT OF COMMUNICATIONS
IT G&S and Capital by Type

$Million

Service Bureau
HW Acq/Rental
Telecom (Data)
HW/SW Support
Development

11.7 13.3 14.8 15 19.3

1985 1986 1987 1988 1989

Fiscal Year End
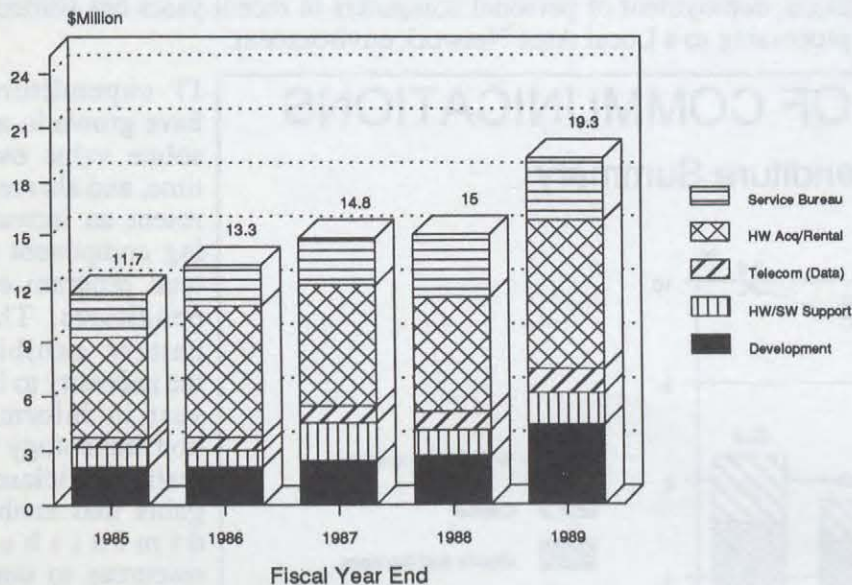
An analysis of IT expenditures by category of expense shows that three of the four largest items are Facilities Management, acquisition or rental of hardware, and support of hardware and software.

Spectrum Management, CHIN and GTA, the latter operating on a cost-recovery basis, have pursued an active and extensive EDP development program over the last six years and must continue to do so. In the corporate Management area, much of the budget serves to maintain the installed base of applications, leaving little flexibility for new development. This will impact the degree to which Information Management can be applied to increase the effectiveness of core applications.

Finally, an analysis of in-house resources involved in Information Technology, upon which IT personnel costs are based, yields a fairly constant level in the range of 130 person-years. The addition of the Canadian Heritage Information Network of the National Museums program saw a growth of 20 in this number in 1988/89. This has been the only major change in dedicated IT personnel over the last five years. With the growth of the local processing environment, many more DOC personnel are involved in the development of local applications. In fact, a concentrated effort is being made to establish self-sufficiency in office technology in each branch within the department.

DEPARTMENT OF COMMUNICATIONS
IT Investments (Acquisition Value)
(Inventory as of 1989 08)

Annual ($Millions)   Cumulative ($Millions)

Calendar Year

Micros (<$10K)   Mid-Range (<$500K)
Large-Scale (>$500K)   Cumulative Value

A mapping of IT expenditures over time (including scientific facilities) illustrates the age distribution of existing IT assets.

This chart reflects the original acquisition value of IT assets still on inventory, and does not represent a time distribution of all IT expenditures reflected on previous charts.
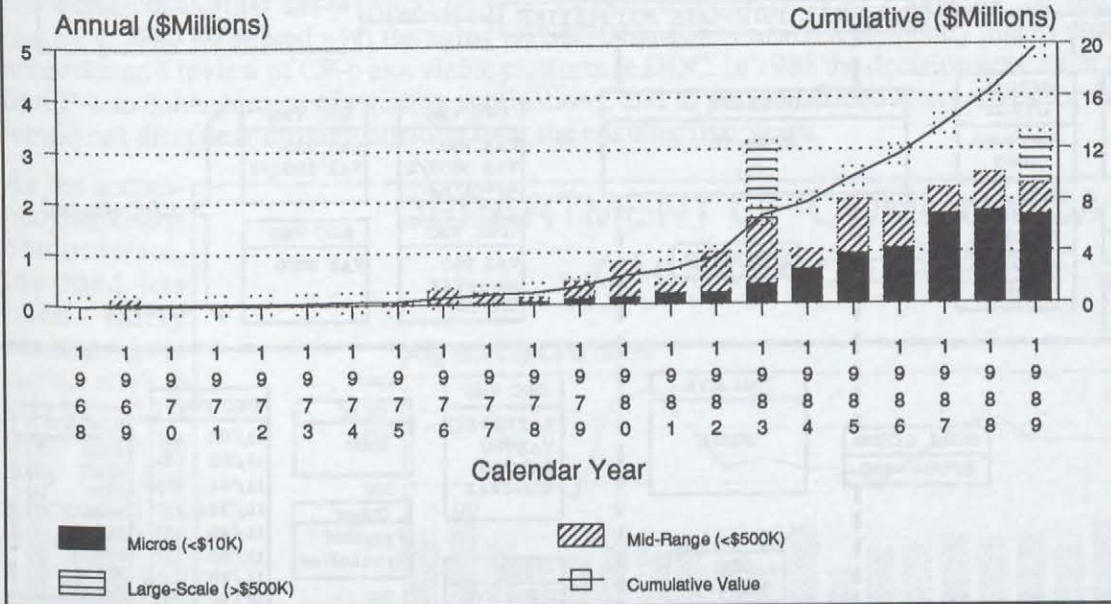
The challenge posed to the department with respect to this aging IT inventory is graphically depicted in the accompanying chart, which reflects the depreciated value of current IT assets.

This aging factor is most keenly felt in the research sector, but will also impact the general purpose facilities as support costs escalate and the large number of XT-level PCs fail to meet the requirements of new microcomputer software.

DEPARTMENT OF COMMUNICATIONS
IT Investments (Depreciated Value)
(Inventory as of 1989 08)

Annual ($Millions)   Cumulative ($Millions)

Calendar Year

Micros (4 yrs)   Mid-Range (5 yrs)
Large-Scale (7 yrs)   Cumulative Value
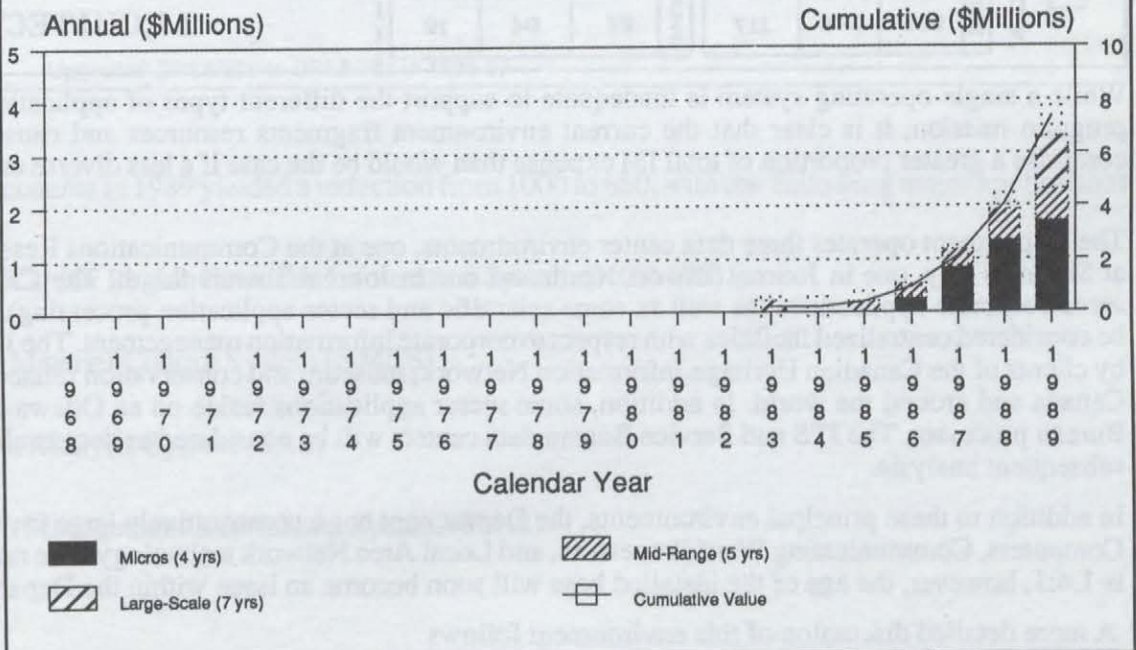
These expenditures have resulted in a diversity which poses a challenge to the effective management and future integration of information processing environments to ensure effective information management and access within the department. The chart below depicts the various environments for corporate applications, community of interest or "mission" systems, as well as research facilities.
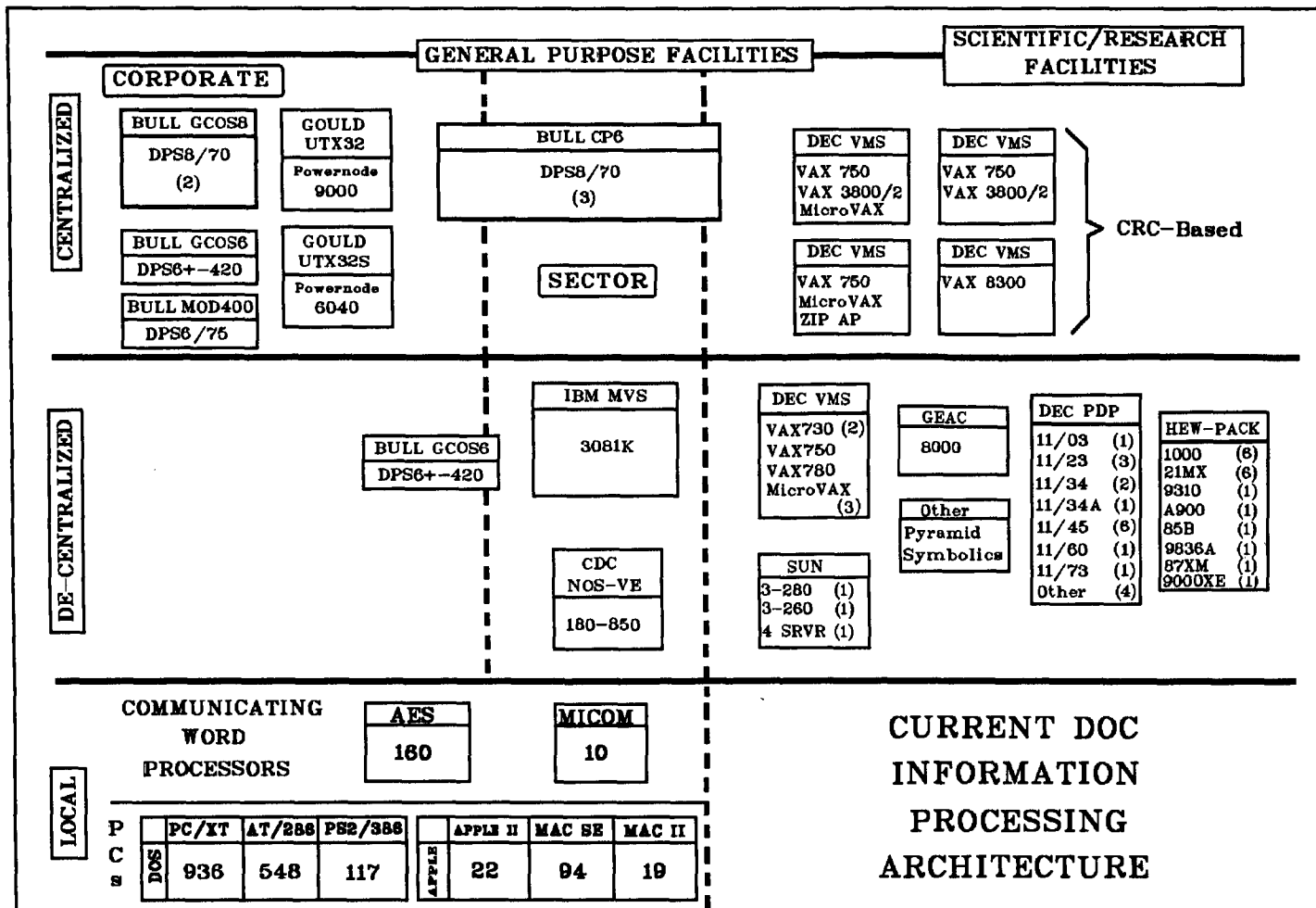
While a single operating system is inadequate to support the different types of applications required by the program mission, it is clear that the current environment fragments resources and causes support costs to comprise a greater proportion of total IM expense than would be the case if a less diverse environment existed.

The Department operates three data center environments, one at the Communications Research Center (CRC) at Shirley's Bay, one in Journal Towers North and one in Journal Towers South. The CRC and JTN centers serve corporate applications (as well as some scientific and sector application processing). These centers will be considered centralized facilities with respect to corporate information management. The JTS center is utilized by clients of the Canadian Heritage Information Network, museum and conservation related institutions across Canada and around the world. In addition, some sector applications reside on an Ottawa-based IBM Service Bureau processor. The JTS and Service Bureau data centers will be considered as decentralized facilities in the subsequent analysis.

In addition to these principal environments, the Department has a comparatively large investment in Personal Computers, Communicating Word Processors, and Local Area Network technology. The ratio of people to PCs is 1.4:1, however, the age of the installed base will soon become an issue within the Department.

A more detailed discussion of this environment follows.

General Purpose (Centralized)

Bull HN CP-6 (3-DPS8/70)

The CP-6 operating system has been the mainstay of the department's corporate and research applications since the 1982 conversion from the Xerox CP-5 environment. However, with the Bull HN announcement of November, 1987 that CP-6 would only be supported for eight years following the shipping of release E00 (January, 1989), coupled with the aging DPS8/70 hardware which realistically places the horizon at five years, necessitated a review of CP-6 as a viable platform in DOC. In 1988 the decision was taken to limit future growth on CP-6 to enhancement of existing applications, and to pursue offload alternatives for those applications that would not disappear through attrition over the ensuing five years.

As the accompanying charts demonstrate, the load has been fairly constant over time, with a slight shift from batch to online processing as scientific / research timesharing usage migrated to minicomputer platforms, to be displaced by more general purpose or commercial data processing applications.

DEPARTMENT OF COMMUNICATIONS
CP-6 WORKLOAD TRENDS

Avg Monthly CPU Hours / Millions

Online CPU Usage — Batch CPU Usage — Terminal Interaction

Upgraded DPS8/52s to DPS8/70s in 1986 07
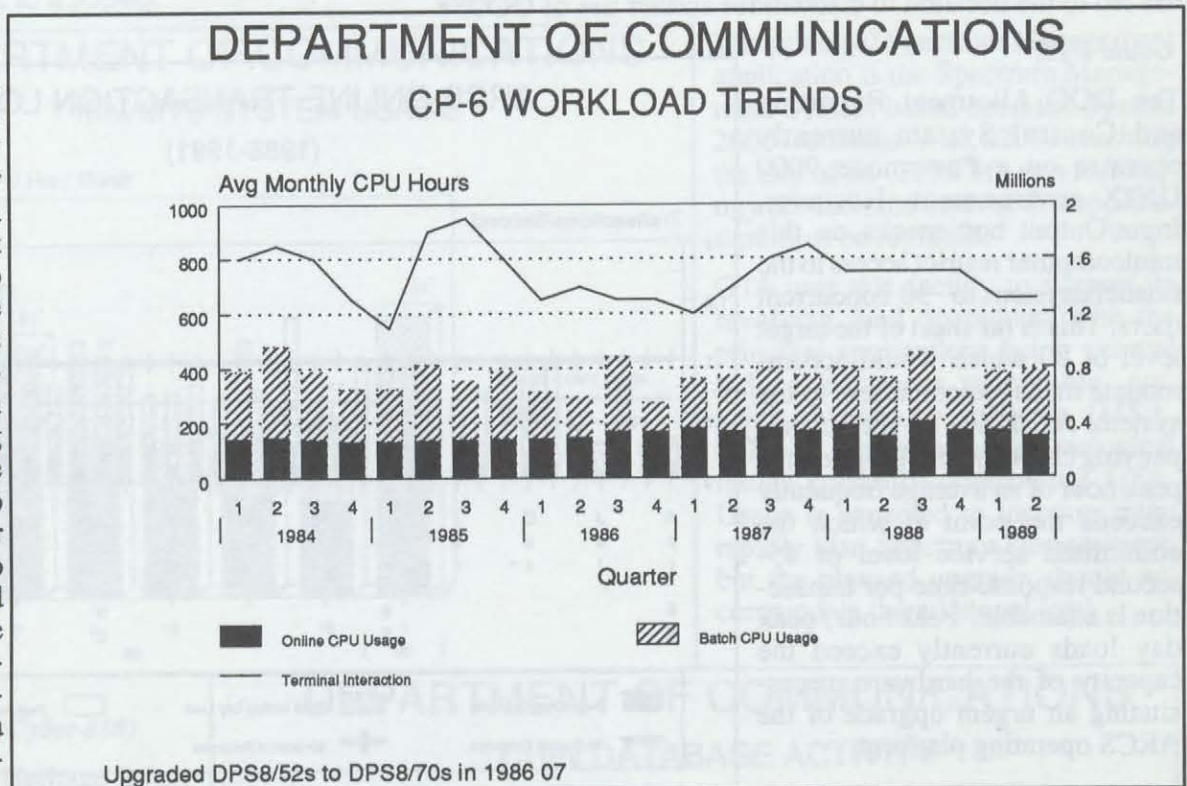
A review of CP-6 accounts in 1989 yielded a reduction from 1000 to 650, with the following major applications remaining :

• National Capital Region Financial Information System (NCR-FIS)

• National Materiel Control System (NMCS)

• Broadcast Analysis System (BAS)

• Spectrum Management Information System (SMIS)

Bull HN GCOS8 (2-DPS8/70)

As a result of the Bull announcement of 1987 12 that CP-6 would not be supported beyond 1996, a GCOS8 license was acquired in 1988/89 in order to make optimal use of the 5 DPS8/70 mainframes and 6 DPS6+ minicomputers installed within DOC. An Integrated Computer-Aided Systems Engineering tool, PACBASE was also acquired in order to increase the effectiveness of application development and support. The decision to acquire PACBASE was based upon the portability of the product to multiple environments, including IBM/MVS, LAN and VAX/VMS, thereby not locking DOC into a specific proprietary environment. Contradicting earlier assurances, Bull has announced that the SR4000 release of GCOS8 will not be supported on the DPS8/70 platform. The need to upgrade the Bull mainframe hardware, the higher than anticipated costs of operating GCOS8, as well as the limited resources available for new development (as reflected in section 6.1) has led to the decision to discontinue further use of GCOS8

Gould UTX

The DOC Allotment Reporting and Control System currently operates on a Powernode 9000 UNIX environment. However, Input/Output bottlenecks on this minicomputer restrict access to the financialsystem to 30 concurrent users. This is far short of the target level of 80 which would accommodate management access to the system. As shown on the accompanying chart, system usage on the peak hour of an average frequently exceeds the point at which the committed service level of 45-second response time per transaction is attainable. Peak hour / peak day loads currently exceed the capacity of the hardware, necessitating an urgent upgrade of the ARCS operating platform.

ARCS ONLINE TRANSACTION LOAD (1988-1991)
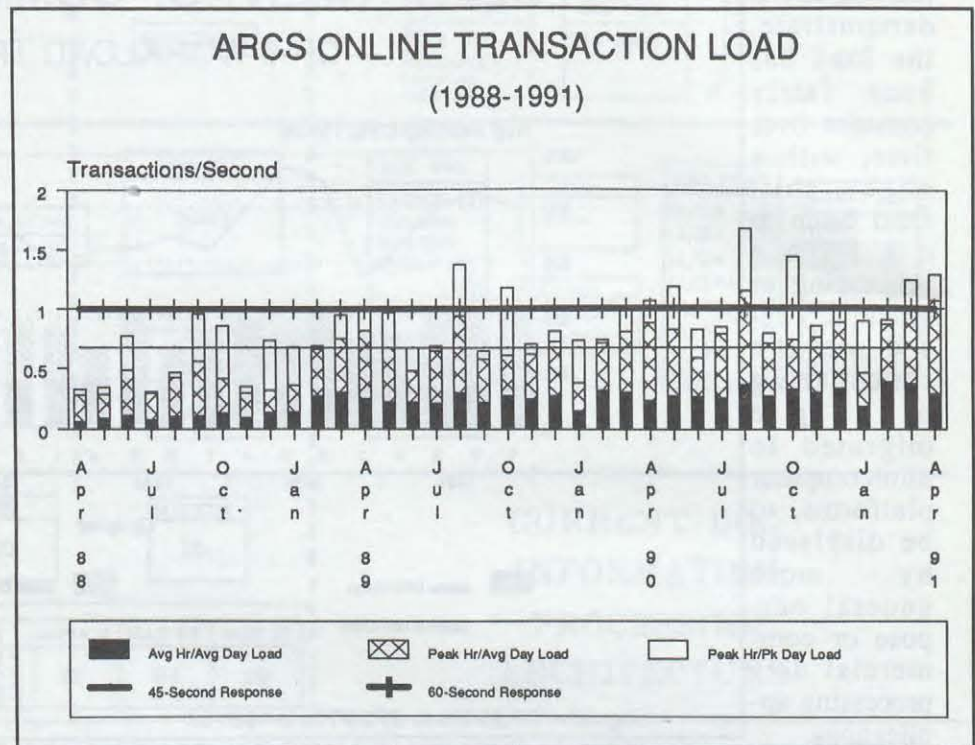
The DOC Correspondence Control System (CCS) currently operates on a Gould 6040 Secure UNIX environment. However, with increasing demands for greater user access and increased functionality, this platform will not be adequate to meet the needs of the application beyond 1990.

Bull HN GCOS6 (DPS6/420)

This machine is currently used as a staging environment for applications to be offloaded from CP-6 to regional DPS6/410 minicomputers. It will be retired in light of the GCOS8 decision.

Bull HN MOD400 (DPS6/75)

This machine serves as a Journal Towers RJE print distributor for CRC and IBM Service Bureau processing. This function will continue, but in order to simplify the diverse operating environments within DOC a more common operating environment will be pursued in the future.

General Purpose Facilities (Decentralized)

Bull HN GCOS6 (5-DPS6/410)

These minicomputers are currently being used to offload some CP-6 data and processing to regional offices where appropriate. They are also targetted for decentralization of corporate applications. However, in light of the GCOS8 decision, they will be retired.

IBM MVS/CICS (3081K)

This service bureau facility supports applications for the Spectrum Management and GTA activities. Recent usage is depicted in the accompanying chart. An increase in capacity is planned for 1991 with the upgrade from the 3081K to a 3084Q.

DEPARTMENT OF COMMUNICATIONS
IBM/MVS SYSTEM USAGE

3081K CPU Hrs / Month

Legend: SMS Usage, GTA Usage

Values: 122, 91, 82, 57, 63, 65, 101

Months: 7, 8, 9, 10, 11, 12 (89), 1 (90)
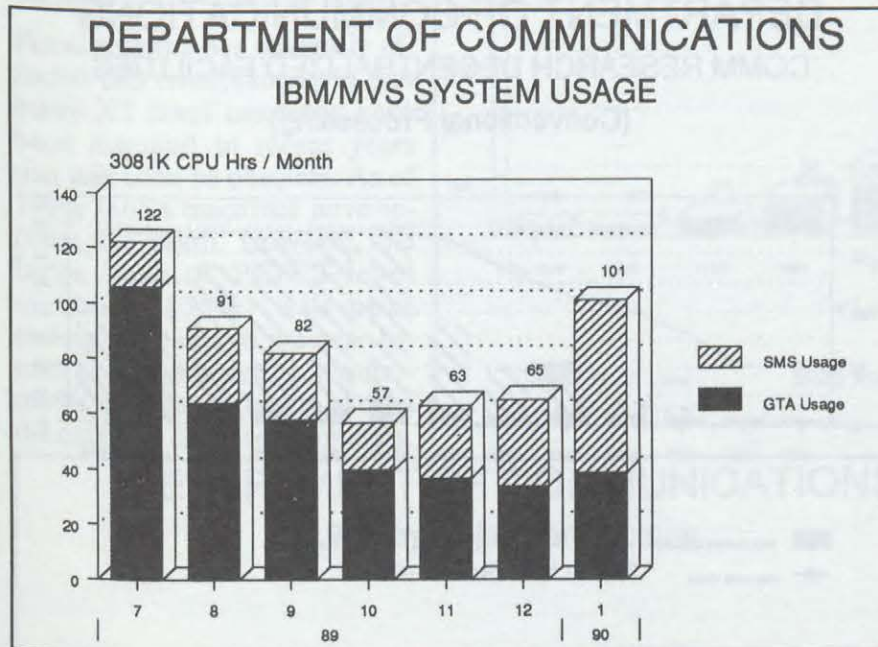
The principal Spectrum Management application is the Spectrum Management System based upon the System 2000 Database. With S2000 reaching the end of its useful life as a technology product, the heart of this application must be replaced.

GTA uses this facility to support its revolving fund operations, with the principal applications being general ledger, accounts receivable, etc, using third-party software (MSA, IDEAL). There are no technological issues currently confronting GTA. Usage is expected to increase more rapidly than Spectrum Management, but the planned upgrade should accommodate the additonal load.

CDC NOS/VE (Cyber 850)

The Canadian Heritage Information Network of the Cultural Affairs and Broadcasting activity uses the CDC CYBER 180/850A mainframe located in JTS in the performance of its progam activities. System software and hardware were upgraded in 1989 to take advantage of the features of the NOS/VE virtual operating system and to meet increasing workload demands. Since the upgrade is so recent, comparison usage information is not available. Representative database activity is depicted in the accompanying chart.

DEPARTMENT OF COMMUNICATIONS
CHIN DATABASE ACTIVITY

000

Values: 220, 385, 278, 197, 407, 273, 294, 344, 158, 216, 237, 143

Months: Jan, Feb, Mar, Apr, May, Jun, Jul, Aug, Sep, Oct, Nov, Dec

1988

Legend: Modifications, Additions, Deletions
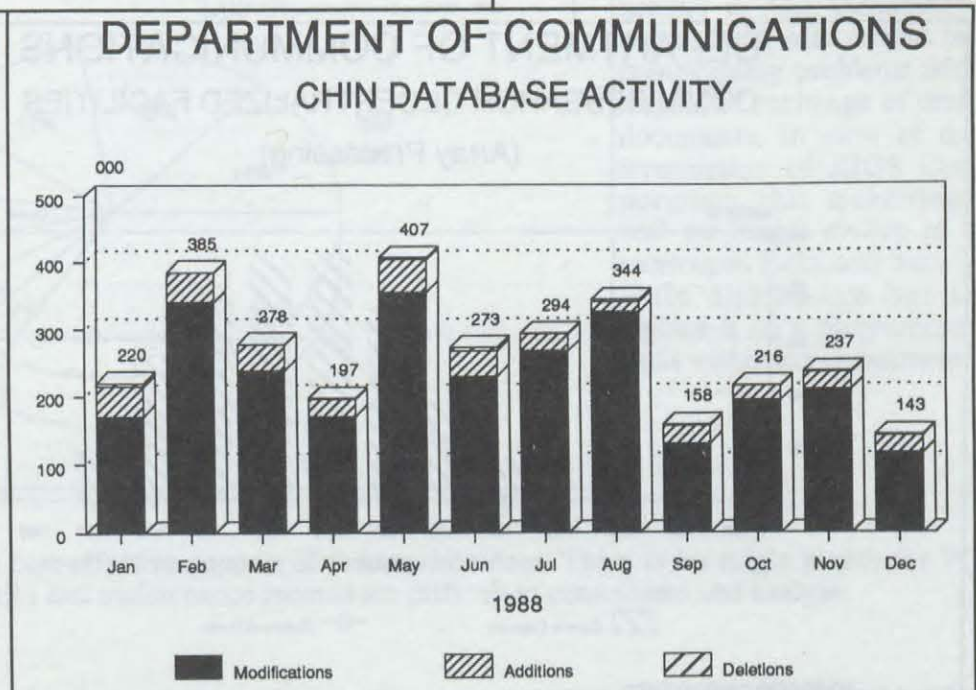
Scientific/Research Facilities

As described earlier, scientific and research processing is performed on a variety of facilities whose acquisition was dependent on the suitability to perform the required task. In mapping out the growth in processing capacity in the communications research subactivity over time, it is useful to treat such growth in terms of industry accepted measures: MIPS (Millions of Instructions per Second) and MFLOPS (Millions of Floating Point Operations per Second).

Research informatics activity typically falls into two categories - day-to-day conventional processing and the high computational intensity that is typified by complex analysis. The former is best expressed in MIPS, the latter in MFLOPS.

The accompanying chart displays the growth in convential processing capacity on VMS, ULTRIX and UNIX engineering workstation platforms. A steady growth VAX facilities has been complemented by a surge in UNIX-based workstations. However, a gap between user load and available suitable capacity is beginning to emerge. This trend, coupled with newer forms of CPU-intensive research will impact the effectiveness of research in the future.

This chart reflects the growth in specialized vector processing capacity to support unique research needs.

DEPARTMENT OF COMMUNICATIONS
COMM RESEARCH DECENTRALIZED FACILITIES
(Conventional Processing)

MIPS = Millions of Instructions / Second
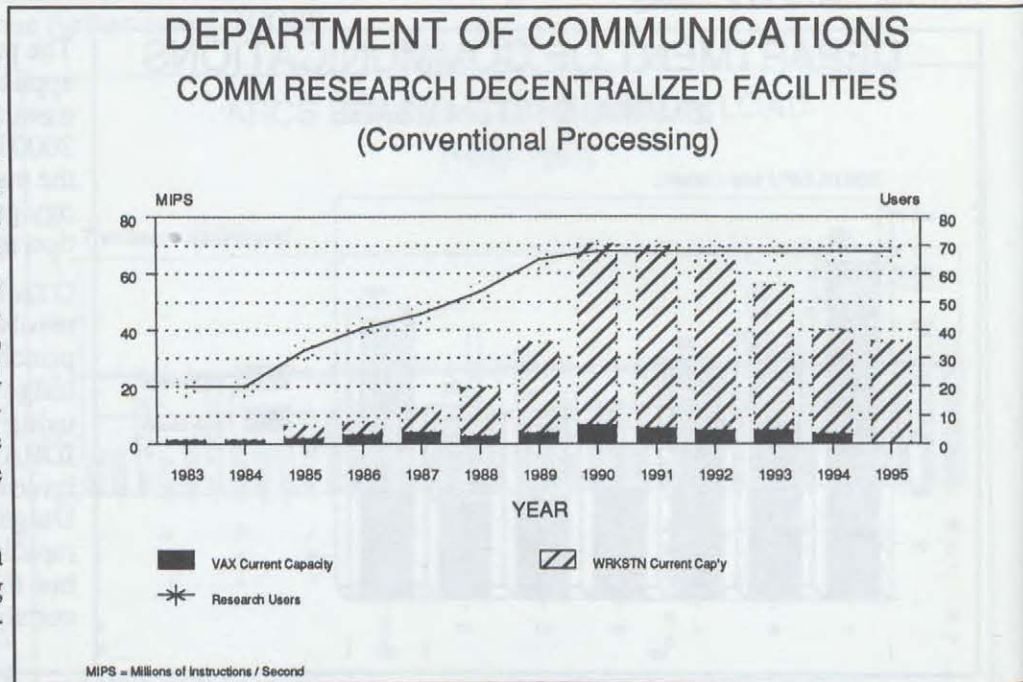
DEPARTMENT OF COMMUNICATIONS
COMM RESEARCH DECENTRALIZED FACILITIES
(Array Processing)

MFLOPS=Millions of Floating Pt. Ops/Sec
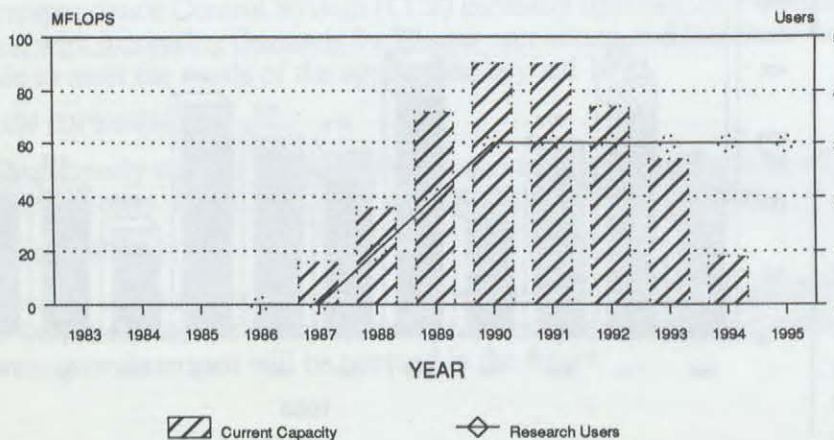
A recent phenomenon, this trend is illustrative of the need for increased CPU throughput in research simulation. This need will grow as research expands in the areas of image processing, and other CPU-intensive work. Vast amounts of storage will also be required to support the complex modelling now emerging.

General Purpose Facilities (Local)

Personal Computers

The Department has pursued the migration to a personal computing environment aggressively, as the accompanying chart shows. MS-DOS machines predominate the environment, representing 92% of the installed base, with the other 8% claimed by Apple.

Fiscal restraint has adversely affected this environment, in that many XT level machines have been acquired in recent years that will soon be obsolete. As of 1990, 386SX machines have become the norm. However, the large base of PC/XT-level machines (55%) will pose serious concerns in the near future as the processing requirements of new software exceed the capacity of these computers.

DEPARTMENT OF COMMUNICATIONS

Personal Computers by Year

On Inventory as of 1989 08
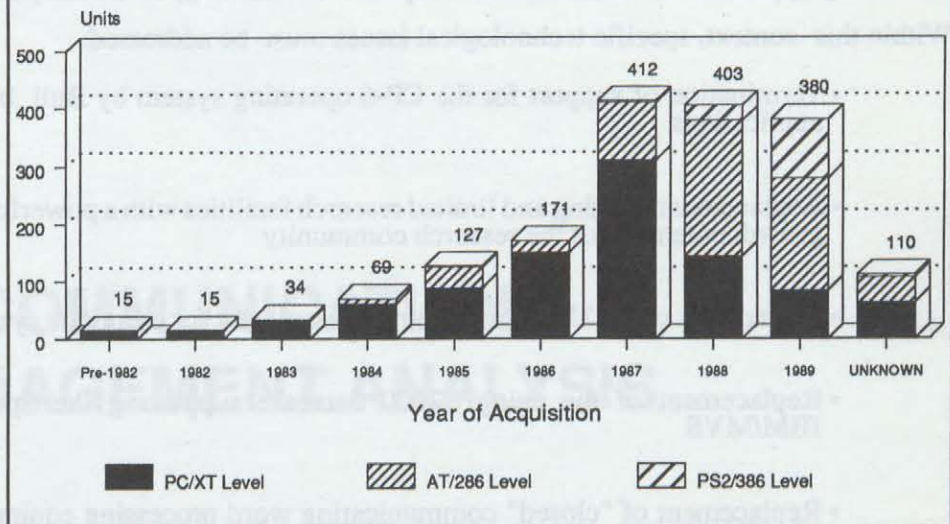
DEPARTMENT OF COMMUNICATIONS

PCs by Major Manufacturer

On Inventory as of 1989 08
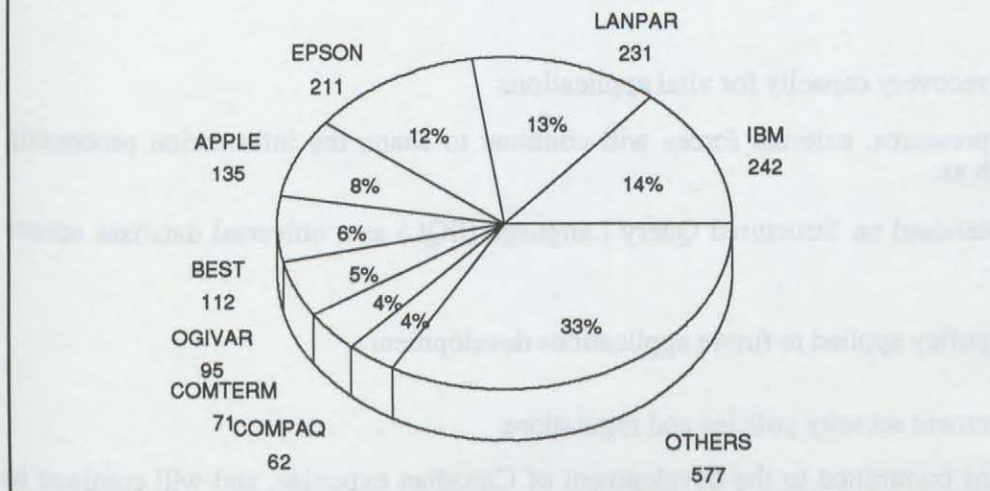
Word Processors

The Department invested heavily in AES technology, and is faced with serious incompatibility problems with respect to exchange of draft documents. In view of the termination of XIOS Corporation, this technology will no longer evolve to a more open form, and there is little alternative but to replace it on a programmed basis within the department.

Another emerging issue is the cost-effective support of this environment. There is no single source for PC maintenance, and true inventories and maintenance records are difficult to consolidate and analyze.

6.3 INFORMATION PROCESSING CONCLUSIONS

The unique information processing requirements of the DOC program preclude the standardization on one operating environment for all applications. However, the existing environment has become too complex to manage. With the retirement of GCOS8 and impending offload of CP-6, an opportunity has arisen to focus on the remaining major operating systems as strategic choices for new development. The fact that IBM/MVS and DEC/VMS represent the greatest installed base in the industry, and, with the exception of PCs, represent the largest proportion of MIPS in DOC, they represent the logical choices as preferred operating platforms for the department. UNIX is added as a third choice given the government drive toward open systems, and the presence of two key applications, finance and correspondence tracking, on UNIX platforms.

Within this context, specific technological issues must be addressed:

- Termination of support for the CP-6 operating system by Bull by 1996 and offload of remaining applications

- Replacement of aging and limited research facilities with a powerful shared processing platform with growth potential for the research community

- Inadequacy of the UNIX minicomputer capacity for corporate systems

- Replacement of the aging S2000 database supporting the Spectrum Management System on IBM/MVS

- Replacement of "closed" communicating word processing equipment with more open technology that is compatible with departmental norms

- Continued renewal of local personal computer processing environment

- Changes in the resource environment at CHIN to support service enhancements and workload increases

- Absence of disaster recovery capacity for vital applications

In addition to these internal pressures, external forces will continue to shape the information processing environment within DOC, such as:

- Government-wide standard on Structured Query Language (SQL) as a universal database access method

- Official Languages policy applied to future applications development

- Adherence to government security policies and regulations

Finally, the department remains committed to the development of Canadian expertise, and will continue to show preferential treatment to Canadian suppliers in support of the Canadian information technology industry

COMMUNICATIONS MANAGEMENT ANALYSIS

7. COMMUNICATIONS MANAGEMENT ANALYSIS

7.1 ANALYSIS OF TELECOMMUNICATIONS EXPENDITURES

DOC has evolved an extensive national telecommunications network, providing a high degree of interconnectivity between headquarters and regional offices. . Through a combination of dedicated facilities, GTA and Common Carrier Services, both the needs of Information Management and the Scientific and Research communities are well-served.
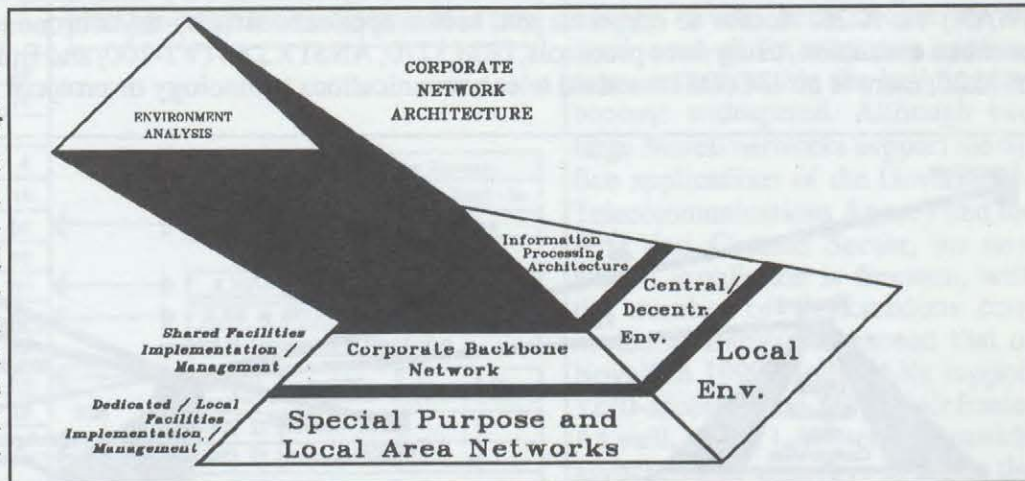
Expenditures in telecommunications equipment have been included in the IT summaries provided in the previous section. However, an analysis of telecommunications usage charges (Goods & Services) show interesting trends over time. These do not include GTA expenditures for government-wide telecomm services.
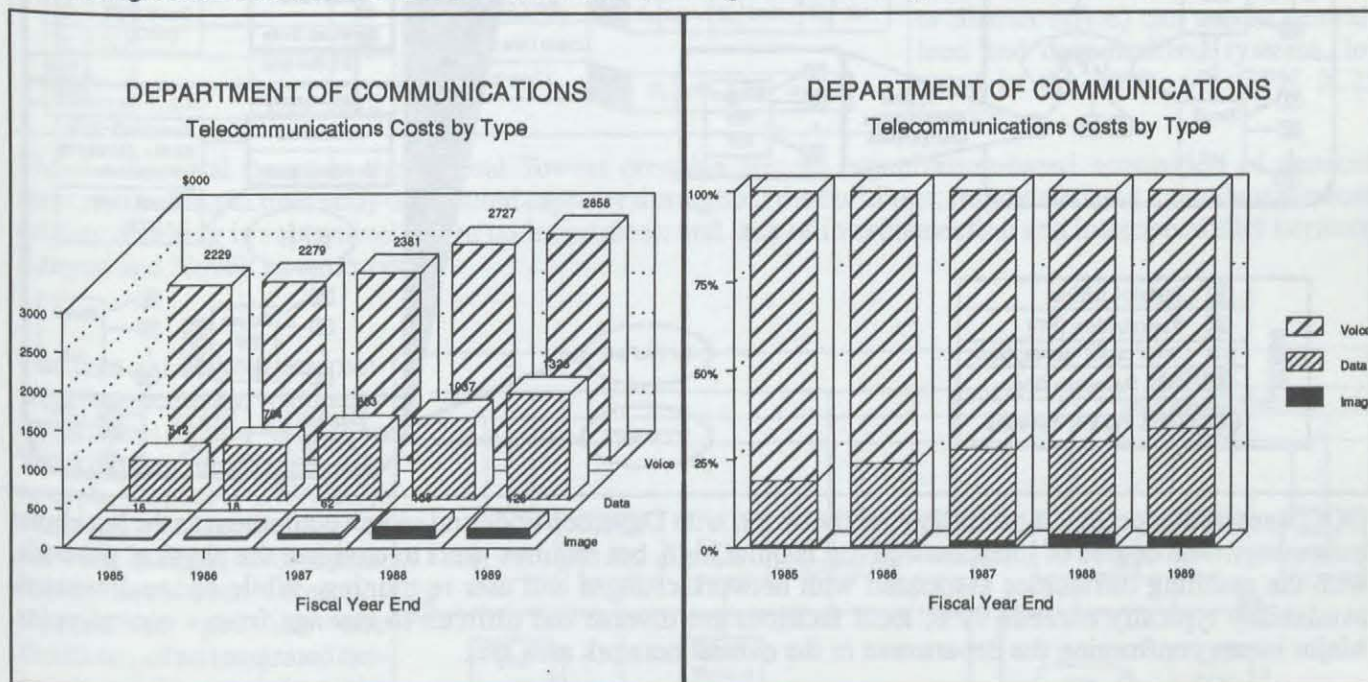
While telecommunications expenditures in the voice, data and image categories have all increased in absolute value over time, data communications have increased substantially as a percentage of total telecommunications charges. This trend will continue as initiatives such as the Government-wide Senior Executive Network results in the more pervasive use of electronic mail within the Department. Conversion of existing batch applications to online systems in the future will also place a heavier demand on the network facilities. The introduction of new telecommunications technologies, such as the Integrated Services Digital Network (ISDN) will blur the traditional distinction between voice, data and image communications, causing a review of how telecommunications is handled from an organizational perspective.

7.2 ANALYSIS OF COMMUNICATIONS MANAGEMENT ENVIRONMENT

An overview of the Department's network facilities is provided in the following diagram. Regional operations, and external access make substantial use of public and Government Packet Network X.25 packet-switched networking to access centralized and decentralized systems. DOC's Banyan LANs will be internetworked (WAN) via X.25. Access to corporate and sector applications is by asynchronous terminal, or micro based terminal emulation, using three protocols, IBM 3270, ANSI X3.64 (VT-100) and Bull's VIP. With the exception of X.25, there is no ISO/OSI standard telecommunications technology or protocol in use.
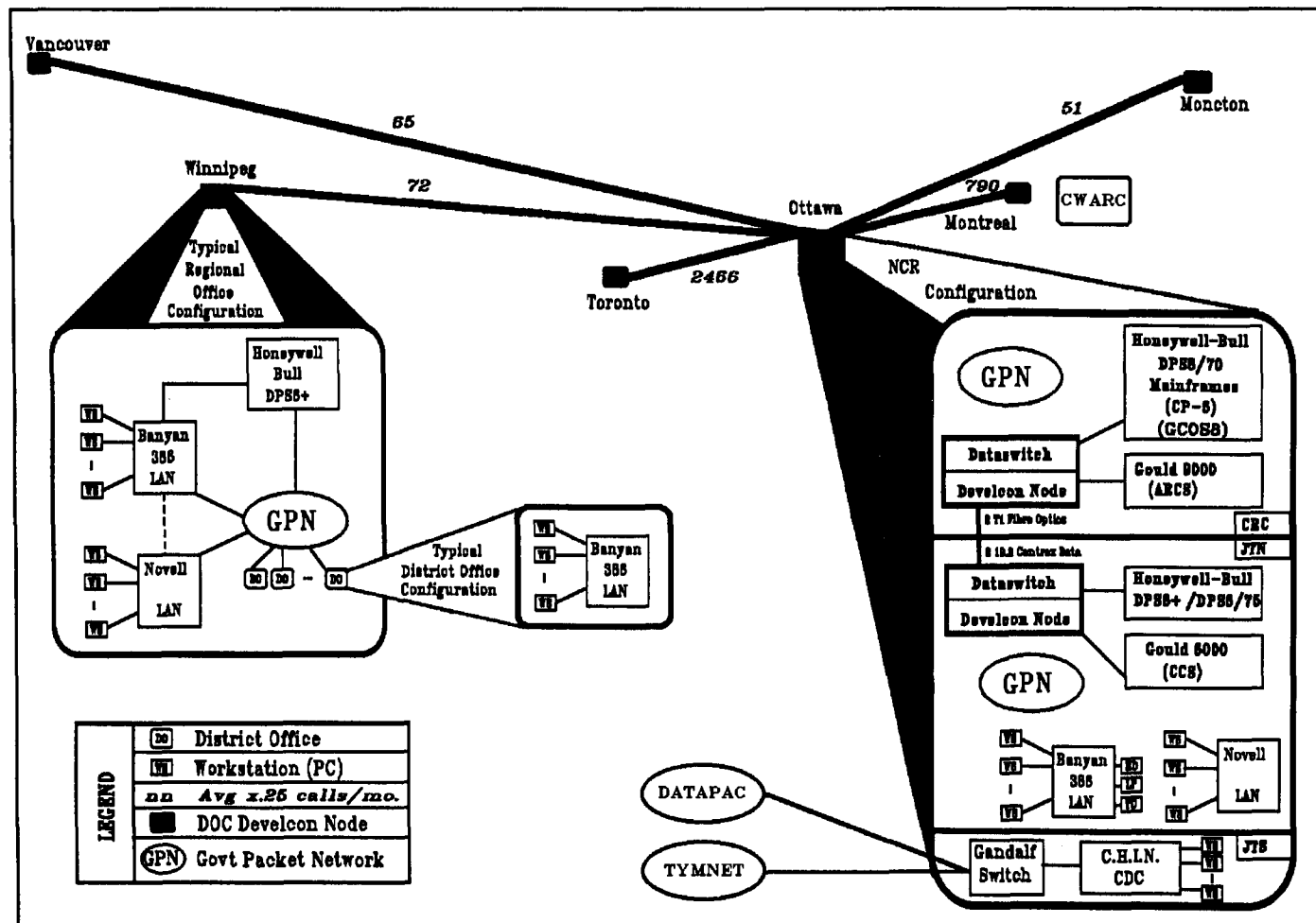
DOC's network topology is basically a star network, with Develcon node and switch equipment as the backbone technology. The degree of interconnectivity is quite high, but requires users to navigate the physical network, with the resulting difficulties associated with network changes and user re-training. While national network availability typically exceeds 99%, local facilities are diverse and difficult to manage from a central point. Major issues confronting the department in the overall network area are:

- Aging dataswitch technology supporting the national network

- Fragmentation of local networks inhibiting centralized network management

- Data Communications growth beyond the capacity of the existing network

The following diagrams depict the network configuration in each of the major premises of the Department.

Fl	Type	Configuration	Capacity	Load
20	B₁	2x386	80	11
	N₂			3
19	B₂	2x386	80	8
18				
17	B₃	1x386	40	15
16	B₄	1x386	40	16
15				
14	B₅			6
	N₁			15
13	B₆	2xCNS 1x386	120	80
12	B₇	1xCNS	40	20
11	B₈	1xCNS	40	30
10	N₂	2x386	200	80
9	N₃			36
8	B₉	1xCNS	40	28
	B₆	2x386	80	18
	D	Develcon Node		
	D	Dataswitch		
7	N₁			15
6	N₂			14
5	N₃			41
4	B₆			6
3	N₂			36
2	N₃			46
1				
TOTAL L.A.N.			560	513

JOURNAL TOWERS (NORTH) CURRENT NETWORK CONFIGURATION

2 SDLC to STM Service Bureau
| X.25 Dial-Out | 3270 Dial-In |
| Regional / District Offices | |

2 SDLC to STM Service Bureau
X.25 & SDLC to STM
LAN Bridge to Regions

CRC	B₆	1xDTS		12
CRC	D	Develcon Node	
CRC	D	Dataswitch	
Regional Develcon Nodes
GEMDES
RJE to CRC & STM

Asynch
Asynch

LEGEND
B Banyan
D Develcon
N Novell

B₁	MINO	B₂	DGAT	B₃	DGIM
B₃	SADM	B₄	ADMSR	B₆	EIS
N₁	GTA	N₂	ADMAC

Journal Towers North is predominated by Banyan and Novell networks. With Banyan LAN technology having been chosen as the local network for corporate applications, its use within the building has become widespread. Although two large Novell networks support the office applications of the Government Telecommunications Agency and the Arts and Culture Sector, no new Novell installation is foreseen, with the number of workstations connected to Banyan to exceed that of Novell in 1990. Both LANs support 3270-access to the MVS mainframe. As well, all the LAN servers provide asynchronous gateways to either the Develcon node or dataswitch. In the regions, where each regional office has a Develcon node, the LANs that are installed in each region (regional or district office) can access centralized and decentralized systems, located in the NCR, via GPN X.25 service.

The fundamental issues in the Journal Towers complex are: an organization-based acquisition of network servers, resulting in unevenly distributed capacity throughout the buildings; fragmented and redundant network cabling resulting in suboptimal return on investment; and lack of interconnection and interoperability between Banyan and Novell environments

The best example of internetwork connectivity within the department is the Canadian Workplace Automation Research Center (CWARC). Through the acquisition of network bridges, diverse platforms have been interconnected to provide the flexibility of an integrated network while retaining the autonomy of powerful research workstations.

The current SL-1 PBX will be replaced with more modern technology, and the SUN R&D infrastructure will be rationalized to address bettter network file system support.

MODEM
DATAPAC 3001
PBX

| mVAX 3800 | mVAX II | VAX Station 3100 | mVAX II ULTRIX | HP 3000XE | | SUN 4/300 | SUN 3/260 | | GEAC 8000 |

PCs (20)

DEC Station 2100

MACs (12)

Terminal Server LAT (3)

Terminal Server LAT/TCP

LocalTalk Bridge (3)

CWARC NETWORK CONFIGURATION

SUN 3/60 (3)

SUN 4/110 (7)

SPARC Station 1 (6)

SUN 3/50 (4)

PBX SL-1

MAU Bridge

CRC CAMPUS CURRENT NETWORK CONFIGURATION

BUILDING 74   BUILDING T3   BUILDING 4

BUILDING 2

DGBT ETHERNET

DGAT Banyan LAN

Floor 3

DGCD MAC NETWORK   DIP VAX780   DGRC MAC NETWORK   Floor 2

DGRC/DGCD ETHERNET

DREO ETHERNET

BUILDING 76

DIO Banyan LAN

Floor 2
Floor 1

GCOS8 DPS8/70
CP-6 DPS8/70
UNIX Gld9000

DEVELCON DATA SWITCH NODE

DCS VAX8300

DRL MVAX   DREO VAX780
DRL VAX750   DSAT VAX750

Floor 1

Basement

The network configuration of the CRC Research Campus is depicted above. This picture indicates a complex series of interconnected networks that have evolved over time. The absence of a single network architecture for these networks has led to similar problems that confront Journal Towers North. Each network has developed within a specific branch, and while some co-operative efforts have been undertaken, redundant cabling and network loops have resulted in a suboptimal use of resources. Complex network bridges and gateways have been added as needs have arisen and funding became available, but without a consolidated network architecture in mind.

This environment also displays the most diverse combination of processing equipment. Not pictured in the overview diagram above are a multitude of DOS-based and Apple personal computers, Apollo and Sun workstations, Symbolics LISP processors, and varieties of printers and other peripheral devices.

While these networks have evolved in response to research requirements, the research community have not had the necessary resources to properly plan or manage this evolution. The fundamental issues at CRC are:

- Designation or creation of a campus local area network

- Expansion of the existing network base to accommodate the conversion from dumb terminals to intelligent workstations

- Simplification of the diverse and redundant networks current in place

- Central management of the campus networks to ensure 99% availability and optimal throughput and performance

The Canadian Heritage Information Network is depicted in the accompanying diagram. This network provides database access to a variety of information resources including an inventory of Canadian collections. This access is provided to insitutions across Canada and in over 20 countries worldwide.

While no major issues currently confront the network itself, opportunities of scale exist with respect to other networks within the Department, and these will be pursued as the wide area network of DOC evolves in the future.

CANADIAN HERITAGE INFORMATION NETWORK
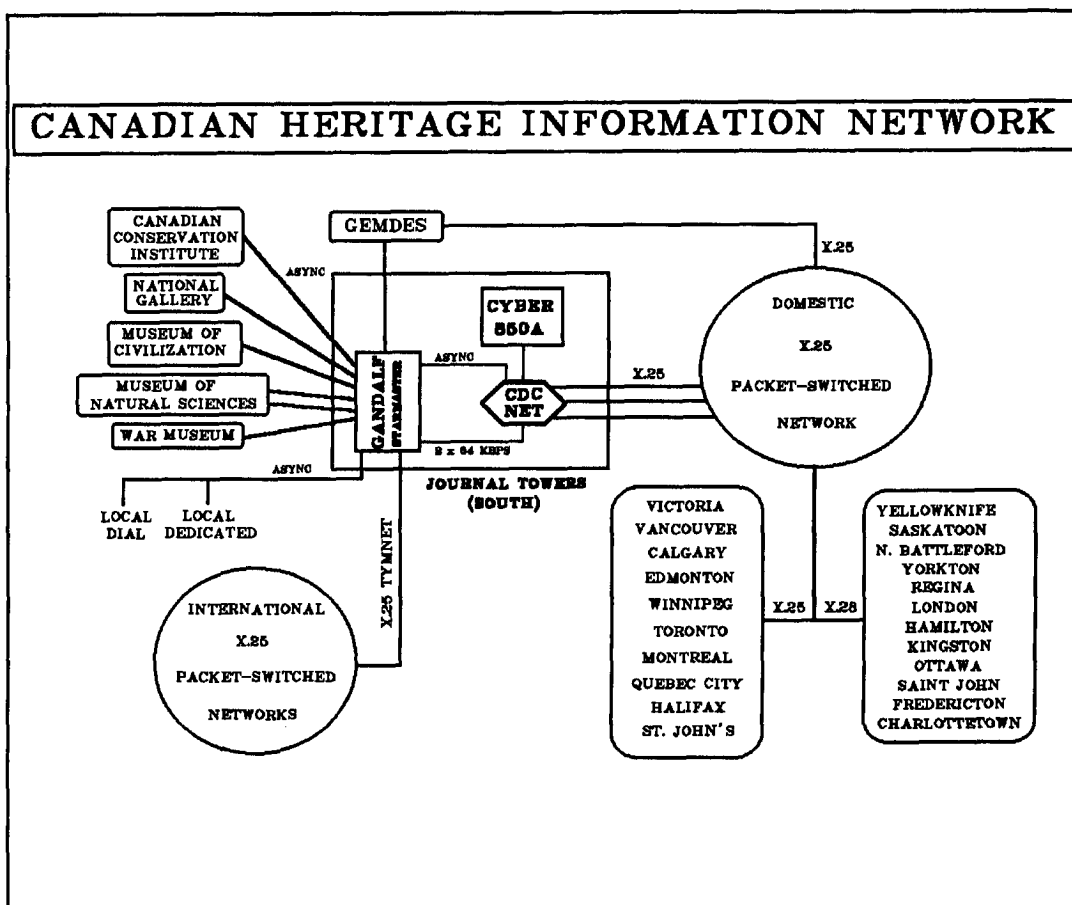
7.3 COMMUNICATIONS MANAGEMENT CONCLUSIONS

The overall diversity and fragmentation of the network environment within DOC leads to two basic issues which must be resolved:

- Management of these networks is not feasible within the constraints of the current configuration

- Sharing of information will continue to be inhibited by the lack of interconnection of local networks and the national network

Specific technological issues to be addressed are:

- Migration to OSI standard network components

- High capacity backbone networks must be established to handle growing server-to-server traffic in the local environment

- A corporate network architecture, based upon physical building characteristics, as well as organizational needs must be established

- Centralized management of networks to ensure optimal availability without compromising existing client support mechanisms

IM STRATEGIES

8. IM STRATEGIES

The subset of program objectives to which IM can be successfully applied over the next five years are derived from the program analysis in Appendix A :

- O1 - Improved Internal Communication
- O2 - Improved Access to Information
- O3 - More Effective and Efficient Operational Systems
- O4 - Proactive Accommodation of Technological Changes
- O5 - More Effective Policy Development
- O6 - Improved Program Delivery through Regional Decentralization

In structuring the IM mission of the department to meet these objectives, a series of strategic projects have been defined that take into account the critical needs of the program, as well as address significant issues in the current information technology environment. These projects are outlined below, and are cross-referenced to the specific program objective each will support, with operational details outlined in Section 9:

- **8.1** Strategic Information Resource Management (**O2, O5, O6**)

- **8.2** Core Management Information System Implementation (**O2, O3**)

- **8.3** Correspondence Control System Redevelopment   (**O2, O3**)

- **8.4** Spectrum Management System Enhancement (**O3, O4, O6**)

- **8.5** Spectrum Control Operations and Management System Implementation   (**O3, O4, O6**)

- **8.6** Department-Wide Integrated Office System (**O1, O2, O5**)

- **8.7** Senior Executive Network (**O1, O2**)

- **8.8** CHIN Service Enhancements (**O3, O4, O6**)

- **8.9** GTA Telecommunications Circuit/Inventory System evolution (**O3, O4, O6**)

- **8.10** GTA Billing System Enhancements (**O2, O3, O6**)

- **8.11** GTA Electronic Directory Implementation (**O2, O3, O6**)

- **8.12** CP-6 Offload (**O4, O6**)

- **8.13** Research Facilities Modernization (**O4, O6**)

- **8.14** Communications Infrastructure Standardization/Evolution (**O1, O2, O3, O4, O6**)

8.1 STRATEGIC INFORMATION RESOURCE MANAGEMENT

The Information Resource Management project will review DOC's information needs, how data is stored and accessed, and how it is processed in terms of the strategic objectives/businesses it supports. It will employ standard information systems industry practices with respect to enterprise-wide information management, as well as address the Treasury Board policy on the Management of Government Information Holdings.

As a result, information/data will be more stable (less subject to change in response to changes in organizational structures or procedures), consistent (less redundancy and ambiguity, based on defined standards), accessible, accurate and amenable to direction by senior managers. In addition, a solid and shared information base (or data architecture) will allow more efficient systems integration, development and maintenance. Put more simply, DOC will know what it has, what it means and what to do with it.

The basic approach will consist of Global Business Modeling of DOC as a whole to anchor the examination of information in strategic directions already established and to provide the framework for further analysis of information resources. The modelling exercise will be carried out independent of current organizational boundaries based upon the general process model outlined below:

DOC PROCESS MODEL
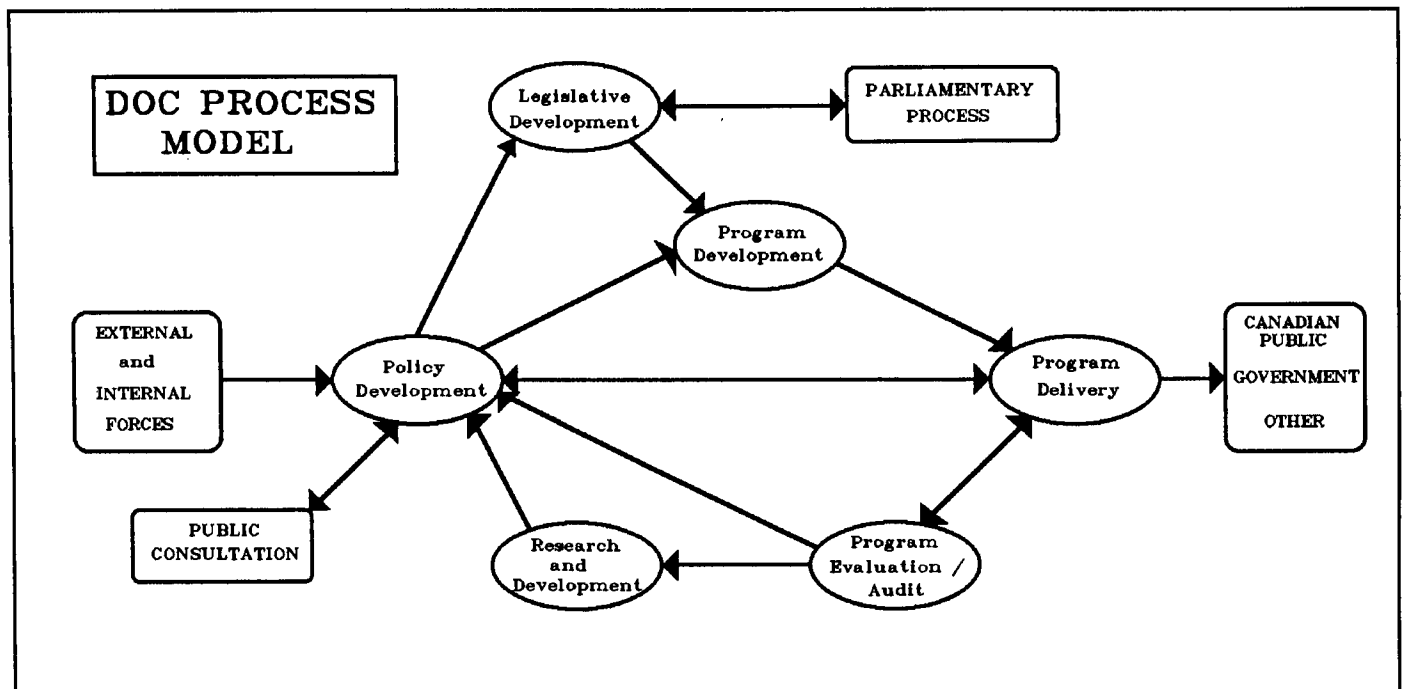
Subsequent steps to be undertaken are:

- building a Systems Encyclopedia to document information and systems

- Global Information Modeling to display information needed to support the business of DOC.

- Conceptual Modeling of selected areas with the greatest potential for improvement.

- determining application priorities and plans to address gaps between information needs and supply.

- establishment of subject data bases linked to data base management technology.

- developing mechanisms to maintain and maximize the use of the models and establishing a data administration function.

8.2 CORE MANAGEMENT INFORMATION SYSTEM IMPLEMENTATION

The PACBASE integrated CASE tool will be the key in the development or redevelopment of corporate core applications. The following application architecture for core systems is envisioned:
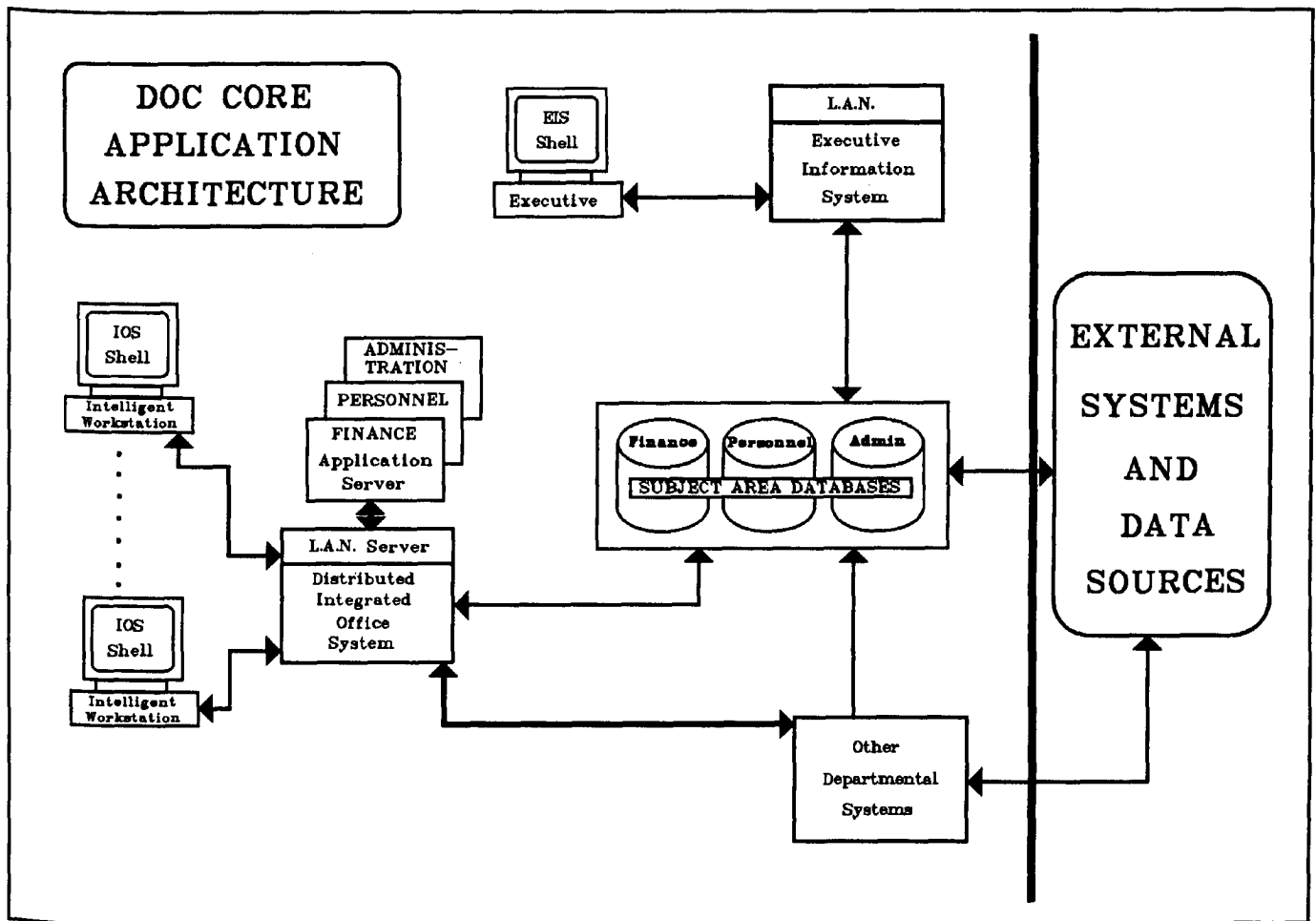
The key feature of this architecture is the continued drive toward streamlining access to data and locating the data as close to the end-user as possible. An application server architecture linked to local area networks will be the critical technology in distributing core databases and transaction processing, with subsequent rollup to corporate-level subject area databases, whose target longterm technology will be determined in the next fiscal year. These subject area databases will serve the global needs for information, including an executive-level information extract, as well as serve as the principal interface between the department and other external systems.

FINANCIAL MANAGEMENT INFORMATION SYSTEM

The departmental financial system (ARCS) will evolve and expand over the next three years. The fundamental steps in this evolutionary development process will consist of:

- the download of selected critical financial information to the Executive Information System, for subsequent graphical display and manipulation by departmental executives.

- the upgrade of the existing ARCS RDBMS and hardware platform to extend access and improve performance of the current ARCS application

- the distribution of financial databases to decentralized platforms. This will improve access to information, improve response time on transaction input and queries, and, with commensurate delegation of authority, streamline departmental financial procedures.

- conversion of current ARCS database to longterm SQL DBMS to form the Finance subject database

PERSONNEL MANAGEMENT INFORMATION SYSTEM

The diverse and non-integrated collection of manual and mechanized systems currently servicing the personnel function will be replaced over the next five years based upon the corporate application architecture. The fundamental steps in this evolution will consist of:

- the mechanization of current manual records (Pay Cards, Roladex, etc) using SQL-driven relational databases in a LAN environment. A mechanized interface to the DSS Online Pay system and automated input of forms will also be implemented. This will provide short-term relief to the backlogged Pay & Benefits group.

- the evaluation of security of protected personal information in a LAN environment

- the download of selected critical personnel information to the Executive Information System, for subsequent graphical display and manipulation by departmental executives.

- the distribution of personnel information databases to decentralized platforms. This will improve the access to information and, with commensurate delegation of authority, streamline departmental personnnel procedures.

- the extension of the LAN-based functions to include relevant functions of Staffing, Classification and Official Languages.

- using the longterm SQL DBMS, implementation of the Personnel subject database

MATERIEL MANAGEMENT INFORMATION SYSTEM

The current suite of programs serving the materiel management function will be converted over the next three years to decentralized applications acquired through the Software Exchange Program of DSS.

The fundamental steps in this development process will consist of:

- the automation of the current manually produced Internal Requisition to an electronic "demand" through the implementation of the Transaction-Based Acquisition Procurement System (TAPS)

- the automatic forwarding of the demands for the appropriate functional reviews, automated commitements through integration with ARCS, and automated input to DSS's PASS system.

- implementation of the Transaction based Inventory Management System (consumables) (TIMS)

- implementation of the Equipment Maintenance and Control System (assets) (EMAX)

- the download of selected critical materiel information to the Executive Information System, for subsequent graphical display and manipulation by departmental executives.

- using the longterm SQL DBMS, implementation of the materiel component of the Administration subject database. This step will be done in parallel with the implementation of materiel subsystems.

8.3 CORRESPONDENCE CONTROL SYSTEM REDEVELOPMENT

The current correspondence control system, limited in functionality and access, will be replaced over the next two years with a new system permitting the capture of incoming correspondence and associated responses, full text archival and retrieval, and enhanced management reporting. The fundamental steps in this development process will consist of:

- a study of functional requirements focusing on deficiencies of the current mechanized application, new desired functionality (such as scanning of inputs), as well as the manual procedures used to control correspondence flow within the department.

- the acquisition of an application package that satisfies the functional requirements and provides a flexible platform for future requirements that can be immediately be extended to more users within the department.

- the download of selected critical correspondence tracking information to the Executive Information System, for subsequent graphical display and manipulation by departmental executives.

- he distribution of correspondence tracking databases to decentralized platforms. This will improve the access to information and, through utilization of a common solution, facilitate the normalization of correspondence handling procedures within the department.

8.4-8.5 SPECTRUM MANAGEMENT SYSTEM ENHANCEMENT

The fundamental precepts for the management of information within this activity are to continue to improve spectrum management operational and administrative efficiency, effectiveness and productivity through the greater use of automation and the further development of automated tools; and to examine, develop and implement mechanisms to ensure the existence of an adequate informatics infrastructure to support spectrum management. The major thrusts of this strategy will be to:

- continue enhancing the existing SMS to accommodate advances in radio technology, new modulation types and new radio services;

- make more effective use of the computing power now available at the desk top and begin to provide graphics interfaces to existing applications;

- provide better tools for spectrum control such as increased accuracy of measured occupancy to ensure more effective and balanced spectrum assignments and extend the Spectrum Control Operations and Management (SCOM) prototype;

- evaluate the cost-effectiveness of the following applications resulting from an independent analysis of activity information requirements:

  * Office Communications System and Improved Co-ordination System

  * Systems Design and Development Tools

  * Integrated Administrative System

  * Standards and Operational procedures development and Access

  * Culture, Communications (Economic Development) and Public Affairs Systems

  * Drafting Automation

- replace System 2000

In addition, appropriate resources will continue to be devoted to the maintenance of existing systems in order to improve their operational effectiveness and their efficiency (where practical). Development of local solutions to perceived problems will be encouraged while maintaining coordination mechanisms necessary to avoid duplication and to optimize the advantage of these local solutions when their benefits are proven.

Of these intitiatives, operational plans for **SMS Migration** and **SCOM** are detailed in Section 9.

8.6 DEPARTMENT-WIDE INTEGRATED OFFICE SYSTEM (IOS)

With the introduction of a prototype Executive Information System in 1989, the stage was set within DOC for the normalization of the office systems interface to conform with the EIS from the top down.EIS is based upon the graphical user interface (GUI) of MS-Windows in a Banyan LAN environment. The strategic importance of the EIS is not merely as a decision support tool for executives, but also as a template for a more widespread rollout of information systems in an office environment within the department.

The fundamental steps in this development process will consist of:

DOC INTEGRATED OFFICE SYSTEM ARCHITECTURE
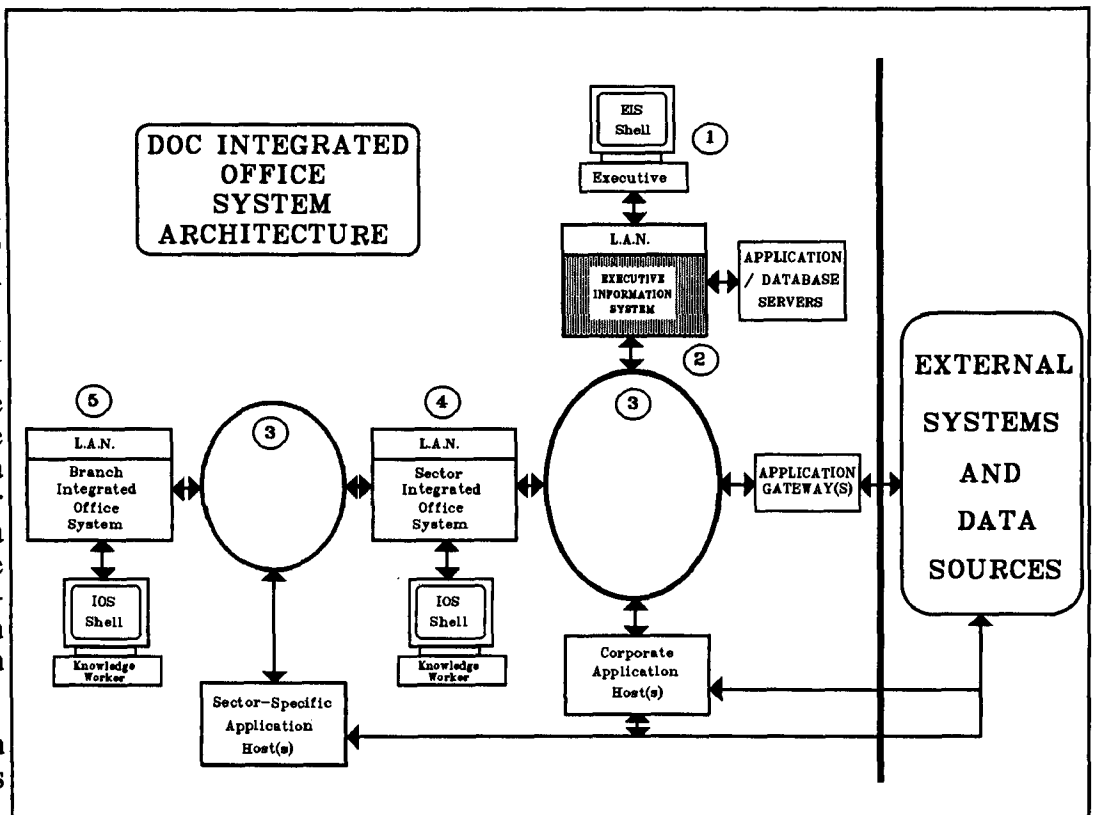
- the implementation of specific applications such as the Minister's Agenda System, Senior Management Committee Agenda and supporting information, and Corporate Directory have been planned for delivery.

- the integration of the various LAN-based electronic mail solutions currently in use within the department. Achievement of this goal will prove the interoperability of all DOC local systems.

- the extension of the EIS system to the rest of the Management Category.

8.7 SENIOR EXECUTIVE NETWORK (SEN)

SEN is intended to link Deputy and Assistant Deputy Ministers across the government, together with the staff of their outer offices, and to provide them with access to information of common interest. The long-range goal is a network that would comprise all senior managers in the government. The GTA GEMDES service and FAX are the network vehicles. The network services are being developed in three stages:

- In addition to messaging services, a range of government information of interest to senior managers is provided

- Customized access to external databases and government databases that have already been commercialized

- The creation of new electronic government databases, if there is a strong client demand matched by a willingness on the part of supplier departments to respond.

8.8 CHIN SERVICE ENHANCEMENTS

In consultation with the museum community, CHIN has identified areas of expansion and new services to meet changing client needs and to take advantage of new technological advances.

In the area of Collections Management, CHIN works with museums to help them develop, implement and maintain better collections management systems to safeguard the collections and the knowledge of their significance. The future will see CHIN providing this service to more museums across Canada.

CHIN has created two national databases, one for the humanities and one for the natural sciences, from the databases of its client museums, and will be working with the museum community to reach its goal of housing information on 90% of the collections in Canada. Other types of information resources available through CHIN include databases such as the Repository of Stolen Art, biographic data on artists, bibliographies citations, newspaper archives and the directory of Canadian museums. CHIN will develop and encourage the development of new databases to meet museum needs. These information resources are used by museums in support of their activities such as research, exhibit design, education, conservation and management.

CIN will expand in the future to provide additional types of information to a growing clientele in more countries around the world, requiring data base development and international network development.

The objective of future network development is to reach a point where any of the 2,500 museums in Canada will have the opportunity to use the CHIN network. This objective will be achieved through partnerships in each province with the appropriate organizations resulting in regional networks in all provinces and territories. CHIN will also be expanding the international network which currently reaches over 20 countries.

To meet these strategic directions, CHIN will be carrying out the activities described below, some sequentially and some in parallel over the short and medium term.

- An evaluation of text based database management packages will be carried out to select a product that meets CHIN's current and future needs in the provision of collections management and information resources services. Factors such as acquisition cost, maintenance costs and conversion costs will be considered in the evaluation.

- Following the software selection, CHIN will evaluate its operating environment to ensure that it remains responsive to workload increases, has the capacity to handle the expansion of client base and the planned additional services. The chosen environment will optimize the use of the software selected above.

- In parallel, CHIN will further develop the national network through partnerships in provinces or regions so that eventually any museum in Canada can access the CHIN network. Also in parallel, the international network will be expanded to serve more clients in more around the world. It is possible that new contracts with international carriers will be let.

- In parallel, CHIN will acquire hardware and software in order to provide new services. Some important areas of study will be image technologies, CD ROM and software developed especially for the museum environment. An electronic mail service will be acquired to lower costs and to be more responsive to client needs and demands.

- Documentation research is an important current and future thrust of CHIN. CHIN conducts research into the development of information standards for museums and acts as a secretariat for the maintenance and evolution of standards. These standards are required by the museum community so that they may properly record information on the significance of collections.

- The rapid explosion of technology and the increased demand on museums for information have made it necessary for CHIN to begin to provide a technology assessment service for museums to ensure that the best decisions are made when using technology in museums. This service will articulate technical standards for the private sector to use in developing systems and will then advise museums on the adequacy of systems for use in varying museum applications. Systems will be acquired and tested in order to objectively advise museums on the compliance of these systems with the standards.

8.9 GTA TELECOMMUNICATIONS CIRCUIT/INVENTORY SYSTEM

This project is an umbrella under which all telecommunications management functions for components of GTN-2000 and other new GTA network-based services will be developed. Its aim is to provide an integrated telecommunications management capability for all Agency users. It will provide an order processing system, circuit/service/facility inventory and supplier invoice verification function for the Shared Intercity Network of GTA. Also included are the circuits managed under the Coordinated Procurement agreement, Customized Voice and Data Services, GPN, GEMDES and other major shared circuit and service offerings as well as major new value added services as they are brought into the GTA portfolio. Most of the applications are written in IDEAL and use the DATACOM/DB database management system. Major components are:

- Implementation of the GPN, GEMDES and Govt. Satellite Network service management and billing systems

- Redesign of the telecommunications circuit management database

- Design of EDI interfaces for ordering of telecommunications services and billing of clients

- Implementation of a telecommunications management, billing and order system for T-1 and other Digital Channel Services

- Analysis of the use and functionality of network management workstations for management of the first three layers of the ISO model and the relationship of these systems to the telecommunications management systems

These development efforts will include the examination of the feasibility of using commercially available software packages, continued use of IDEAL and DATACOM/DB, as well as the use of EDI for ordering and the receipt and dispatch of invoices.

8.10 GTA BILLING SYSTEMS

GTA must improve its responsiveness to client needs. Many clients have demanded more timely billing from GTA, with many also requesting information in various formats. This project will examine how GTA can improve its billing system and the various applications that are used to calculate a client bill. It will also provide for quicker and more automated verification of supplier invoices and provide for greater flexibility in the combination of services which are billed on one invoice. The ultimate objective will be to provide clients with their invoices and itemized detail in electronic format using EDI tehcniques for the transmittal of this information. Finally, all GTA client services personnel in regions and HQ will be given access to client billing information, including invoice and itemized details. Major components are:

- Develop plan for billing system improvements based on recommendations from Billing Study review

- Implement automated interfaces between existing service inventory and usage applications and the billing system

- Implement automated vendor bill verification applications for existing services

- Provide integrated links between onvoices and listing of itemized details

- Development of EDI-based system for client invoicing

8.11 GTA ELECTRONIC DIRECTORY IMPLEMENTATION

The project will examine the practicability of making the Federal Government telephone and departmental directories available for on-line access by both the public and government users.The French "Minitel" trial has demonstrated the concept and feasibility of using inexpensive display terminals by the general public to access directory and information services. A CWARC study has indicated feasibility for government users to access and update GOC directory information using similar technology. CRC has conducted related studies and is assisting in the human interface to such a system. Industry support liaison will ensure information exchange on Bell's "Alex" trial.The database design will take into account both directory phototypesetting production and the needs of an on-line directory. The input process of the existing PC-based departmental update system will also be accommodated. Subsequent steps to be undertaken are:

- definition of the on-line system requirements and functional specification and RFP

- definition of the database for implementation on common GTA facilities and the development of the electronic interface for client access.

- trial implementation of the on-line update capability and on-line operator service to selected departments and subsequent extension to the Government and Public

8.12 CP-6 OFFLOAD

With the impending obsolescence of the CP-6 operating environment, a concerted effort must be made to offload processing from that environment as soon as possible. In addition to reducing overall operating costs through the elimination of redundent software license and support costs, it will save the costly upgrade to another level of proprietary vendor hardware to support the system in the next several years.

DEPARTMENT OF COMMUNICATIONS
CP-6 LOAD BY APPLICATION
89/90 Avg Monthly System Charges ($000)

REGIONAL USERS 4.6
BROADCAST ANALYSIS 25.1
SPECTRUM MGMT IS 24.6
CRC RESEARCH 12.3
OTHER 13.5
DREO/SPACE/EXTERNAL 5.1
FINANCE 6.6
MATERIEL MGMT 6.4
INFORMATICS MGMT 14.6

The major steps to be taken in this offload initiative over the next three years are:

- the assessment of retained load and user base

- the development of a migration strategy

- the development of a detailed migration plan addressing the offload of individual users and applications to target environments, as well as the requirements and costs of parallel processing during the transition
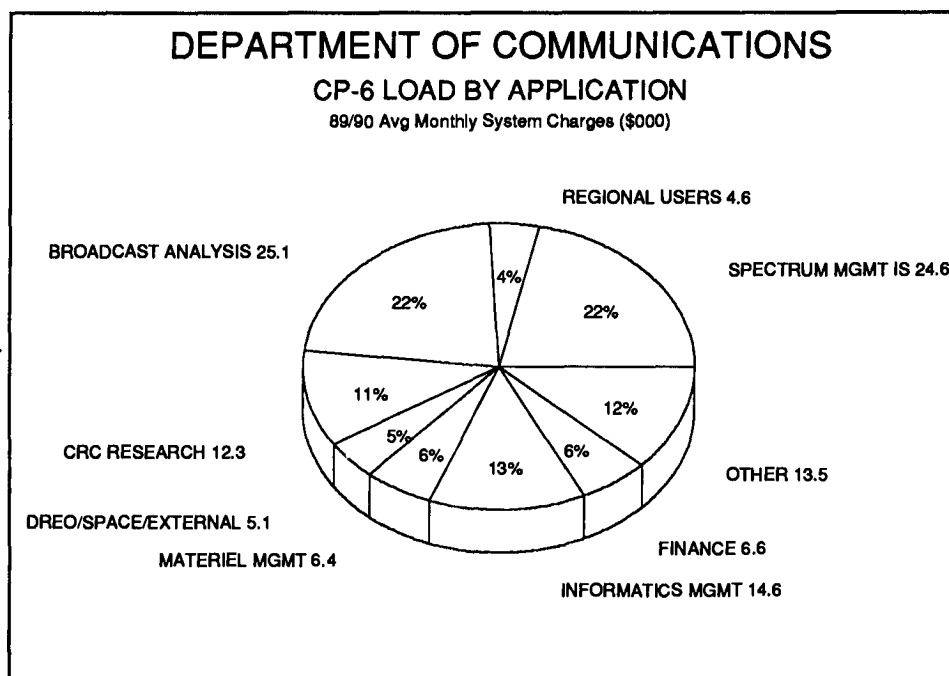
8.13 RESEARCH FACILITIES MODERNIZATION

This project represents a thrust to augment and modernize the informatics processing resources available to the Communications Research activity. As discussed previously, the effectiveness of research is being constrained by the lack of adequate informatics resources. The re-establishment of a shared facility for support of research processing (a vision of which is depicted below) will provide significant advantages over the existing informatics environment:

The provision of a central network file service for engineering workstations and microcomputers will remove existing storage environment constraints. In addition, central storage will facilitate file sharing & exchange, electronic mail and bulletin boards.

While some of the existing applications may not lend themselves to transition to the shared facility, the establishment of such a facility of sufficient power would ensure the availability of adequate computer power to address both the day to day demands of research processing and the unusual high demands that surface from time to time. This would be best accomplished through the use of powerful general processors augmented by integrated array processors.

FUTURE RESEARCH ENVIRONMENT
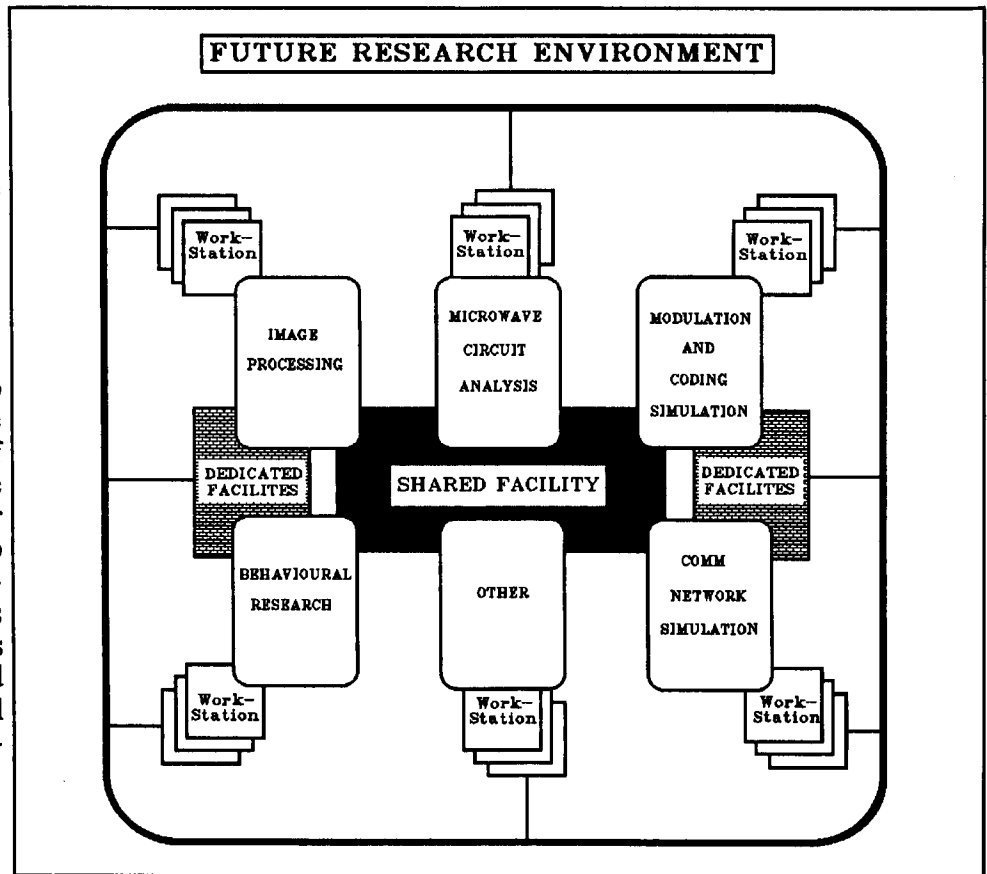
The major steps to be taken in this modernization process are:

- the identification of those research components that would be candidates for modernization

- the definition of hardware/software configuration for shared facility.

- the incorporation of CP-6 offload characteristics (hardware & software) where applicable

- the completion of TB submission

- the Treasury Board decision

- the procurement and installation of the new platform

- the re-deployment or disposal of redundant or obsolete equipment

Limitations and age of the communications network used in the Department necessitate modernization of these facilities. Two key elements will characterize the thrust of this modernization -- standards and economy. Standards indicate that the system will be designed to conform with OSI standards and the federal government's interpretation of these standards. Economy means that the modernization will be achieved by using, to the extent possible, the existing framework with enhancements from commercially-available off-the-shelf products.
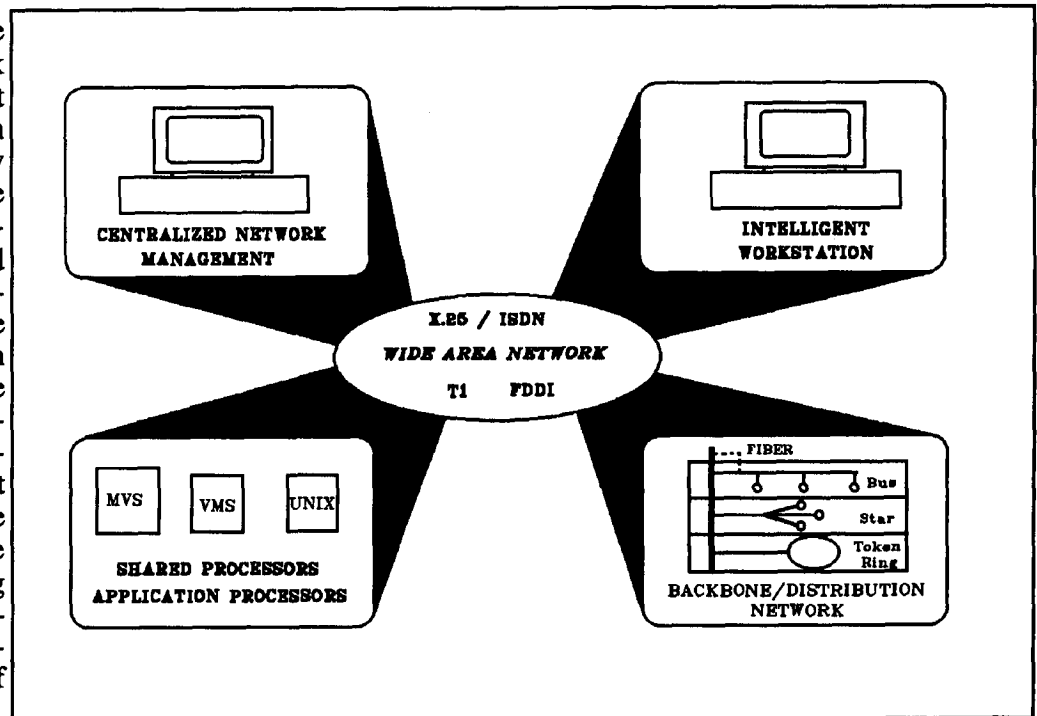
This project includes the following steps:

- Interconnection of district, regional office and headquarters file servers into a Wide Area Network

- The development of a fully-compliant X.25 network to meet OSI standards aimed at achieving a high level of accessability and interconnectivity to all corporate and sector services.

- Development of an Office Communications Configuration: The development of standards for wiring the work place of the future to ensure that all offices will be able to take advantage of the emerging technologies, such as T1 and FDDI speeds, and to reduce bottlenecks on the interconnecting communications networks, including the use of optic fibre backbone and work station services.

- Establishment of Central Network Management Facilities for the effective and efficient operation of the communications network.

- Contingency Planning to ensure that single points of failure are eliminated or the effect of their loss will be reduced.

- Pursuit of Electronic Data Interchange (EDI) which has potential in electronic license application and issue, as well as telecommunications services ordering and invoicing.

1990/91 OPERATIONAL PLAN

9. 1990/91 OPERATIONAL PLAN

This section provides extracts from sector operational plans that relate directly to individual strategic projects. A summary of ongoing operational expenses is also given to arrive at total forcast expenditures for IM in 1990/91. More detailed project descriptions and milestones follow the table below:

STRATEGIC PROJECT NAME	Person-Years*	G & S ($000)	Capital ($000)
1. Information Resource Management	2.0	20	-
2. Corporate Core Management Systems	5.5	150	-
3. Correspondence Control System	1.5	50	150
4. Spectrum Management System Migration	1.0	100	
5. Spectrum Control Operations & Management	4.0	150	
6. Integrated Office System	7.5	320	50
7. Senior Executive Network	6.0	1,083	385
8. CHIN Enhancements	6.0	500	150
9. GTA Telecomm Circuit/Service Inventory	6.5	515	40
10. GTA Billing Enhancements	3.0	110	-
11. GTA Electronic Directory	4.0	200	30
12. CP-6 Offload	0.5	**	**
13. Research Facilities Modernization	1.0	**	**
14. Telecomm. Infrastructure Standardization	1.0	15	100
STRATEGIC PROJECT TOTAL	**49.5**	**3,213**	**905**
EXISTING SYSTEM SUPPORT (Est.)	.	.	.
Professional Services (Support/Enhancements)		3,000	6,500
Service Bureau / Facilities Management		3,500	
Hardware Replacement / Software Upgrade		1,500	
Telecommunications Usage (Data)		1,500	
Hardware/Software Support		2,000	
SYSTEM SUPPORT TOTAL	**120.5**	**11,500**	**6,500**
DOC OPS PLAN TOTAL	**170**	**14,713**	**7,405**

* Includes only EDP-related person-years, not client or user person-years.

** To be included in a Treasury Submission in 1990/91.

9. 1990/91 OPERATIONAL PLAN (Continued)

The following is a more detailed description of each strategic project, with key milestones identified. These milestones are significant as they will form the basis for reporting project progress in the 1990/91 DOC Annual Management Report. The key indicator to be reported based upon these dates is the percentage of milestones met on schedule during the year. This indicator, together with system availability and network availability will summarize IM performance at the departmental level. It is not intended to report progress against plans in the 1990/91 DOC IMP, but rather to provide a forward view of strategies that will reflect any changes due to the work performed in 1990/91 operational plan.

9.1 Strategic Information Resource Management

This project will define the top two levels of the departmental business model and then determine which area of the program to further develop from a business and data model perspective.

- **1990 12** - Complete Global Business Model (Top 2 layers)

- **1991 03** - Issue 1990/91 Strategic Information Management Plan

9.2 Corporate Management Core Systems

This project will address the major enhancement of the departmental Financial system (ARCS), automation of the Personnel Pay and Benefits function, and automation of materiel acquisitions (TAPS/TIMS).

- **1991 03** - Upgrade ARCS Hardware Platform

- **1990 12** - Financial Management Information prototype

- **1990 06** - Pay and Benefits Application Development Plan

9.3 Correspondence Control System Replacement

This project will address the identification of changed user needs in the control and tracking of departmental correspondence, resulting in the acquisition of a replacement for the existing system.

- **1990 06** - Correspondence Control Feasibility Study

9.4 Spectrum Management System Migration

This project will address the replacement of the S2000 database management system currently supporting the SMS application. Work to be done in 1990/91 includes establishment of the evaluation criteria for a replacement database, and assessment of major DBMS against these criteria, resulting in a migration plan for SMS.

- **1990 12** - Select SMS DBMS replacement

9. 1990/91 OPERATIONAL PLAN (Continued)

9.5 Spectrum Control Operations and Management

This project will address the implementation of a prototype of the land fixed component of the Spectrum Control Operations and Management System.

- **1990 08** - Complete function specification for land fixed component of SCOMS

- **1991 03** - Implement land fixed SCOMS prototype

9.6 Integrated Office System

This project will address the development of additional content for the Executive Information System, as well of the extension of that system beyond the executives of the department.

- **1990 05** - Implement Senior Executive Network within DOC

- **1990 07** - Implement Minister Agenda System

- **1990 09** - Complete Department-wide Electronic Mail Implementation Plan

- **1990 10** - Complete Executive Financial Information System Prototype

- **1991 03** - Complete Wide Area Network Implementation in Regions

9.7 Senior Executive Network

This project will address the interconnection of DMs and ADMs across the government, with the focus in 1990/91 on establishing basic communications infrastructure and initial services, and adding selected information services on an incremental basis.

- **1990 05** - Implement Senior Executive Network Stage 1

- **1990 09** - Commence S.E.N. Stage 2 Services

9.8 CHIN Service Enhancements

This is an umbrella project addressing a variety of service enhancements to the Canadian Heritage Information Network.

- **1990 04** - Electronic mail acquisition

- **1990 06** - Image technology acquisition

- **1990 09** - Complete DBMS Software evaluation

- **1991 03** - Complete Replacement Hardware evaluation

9. 1990/91 OPERATIONAL PLAN (Continued)

9.9 GTA Telecommunications Circuit/Service Inventory System

This project addresses the integration of all GTA telecommunications management functions.

- **1990 05** - Implement GEMDES management and billing system

- **1990 12** - Implement GPN Service Management and Billing System

9.10 GTA Billing Systems

This project addresses the overall improvement of GTA billing systems.

- **1990 10** - Implement interfaces between service inventory and usage applications and billing system

- **1990 10** - Implement integrated links between invoices and listing of itemized attachments

9.11 GTA Electronic Directory

This project examines the practicality of providing on-line access to the Federal Government and departmental telephone directories.

- **1991 03** - Implementation of on-line update capability to selected departments

- **1991 03** - Implementation of on-line operator directory service

9.12 CP-6 Offload

This project addresses the migration of applications from the obsolete CP-6 operating environment to more modern and longer-term operating environment.

- **1990 10** - Complete CP-6 Migration Plan

9.13 Research Facilities Modernization

This project addresses the modernization and possible consolidation of research processing environments.

- **1990 06** - Complete Research Requirements Definition and Cost/Benefit Analysis

9.14 Communications Infrastructure Standardization

This project addressed the evolution of the DOC network facilities toward OSI standards.

- **1990 09** - Complete CRC Fibre Optic Installation

- **1991 01** - Complete Journal Towers Network Plan

APPENDIX A
STRATEGIC PROGRAM THRUSTS

APPENDIX A - STRATEGIC PROGRAM THRUSTS

A.1 PROGRAM MISSION

NATION BUILDING Helping Canadians share their ideas, information and dreams

This mission reflects the Department's mandate in law and also its central role within the Federal Government in strengthening the Canadian nation through communications and culture. It emphasizes a commitment by the organization and its employees to a future-oriented outlook aimed at serving the Canadian public through effective teamwork which anticipates change, pursues opportunities and respects human values.
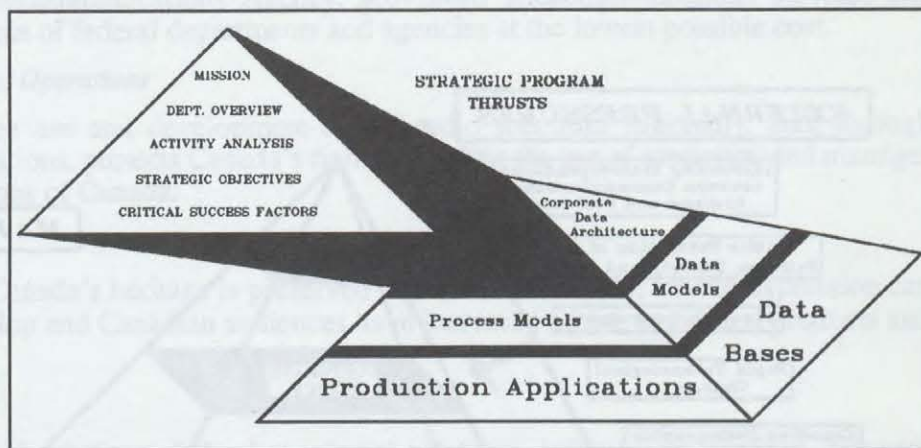
This focus of the mission is two-fold:

- The communications systems that link us by carrying our information and values, and

- the availability of Canadian cultural products and information services.
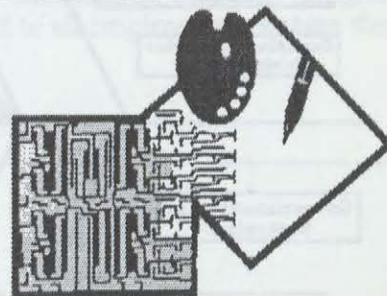
Together, they constitute the central nervous system of our society. They bring Canadians together for work, learning, entertainment and service to the public. They enable us as individuals to express our collective reality as a nation. They make possible the contact among people which nourishes and magnifies the creativity and innovation essential to Canada's social, cultural and economic integrity.

Today's rapid technological change multiplies the power and reach of communications and information systems, leading to growing interdependence between carriage and content, between media and culture, and in the relationship between communications and the economy as a whole.

In pursuing its mission, the Department demonstrates leadership in a changing environment to make Canada stronger through the linking of communications and culture. We strive for excellence in policy development, research activities, regulatory functions, government telecommunications procurement and support services in order to:

- ensure that Canadians have telephone, television, radio and communications services that are the best in the world;

and

- promote freedom of choice for Canadian consumers through a wide selection of high quality Canadian cultural products and information services which are easily accessible and affordable.

A.2 DEPARTMENTAL OVERVIEW

The mandate of the program is derived from a number of sources, including the Department of Communications Act, Order in Council P.C. 1980-2128, the Radio Act and the Cultural Property Export and Import Act. The program consists of a number of activities aimed at ensuring that Canadians have access to Canadian cultural products and services and the orderly evolution of the communications systems essential to Canada's social, cultural and economic development and integrity.

EXTERNAL PRESSURES

- Increasing Interdependence between Communications Systems and Content
- Public Perception of Fairness, Honesty and Equity
- Canadian Sovereignty
- Rapid Technological Change
- Canadian Demographic Changes
- Canadian Economic Environment
- Government Fiscal Restraint
- Changing Workplace Environment
- Increased Ministerial Authority and Accountability

INTERNAL PRESSURES

EXECUTIVE

CORPORATE POLICY

TECHNOLOGY & RESEARCH   CULTURAL AFFAIRS AND BROADCASTING

SPECTRUM MANAGEMENT & REGIONAL OPERATIONS

CORPORATE MANAGEMENT

ACCESS TO INFORMATION

MAJOR PROGRAM OUTPUTS

- Policies, Procedures and Standards
- Government Telecommunications Services and Advice
- Spectrum Frequency Allocations
- International Agreements
- Legislation and Regulations
- Radio Licenses and Broadcast Certificates
- Engineering Studies and Equipment Certifications
- Communications Industry Support Programs
- Cultural Industry Support Programs
- Heritage Information
- Postal Subsidies
- Information Services
- Economic Regional Development Agreements
- Information Access Response

The communications and cultural portfolio of the Minister of Communications consists of nine agencies and Crown corporations besides the Department of Communications. These other agencies are the Canada Council, the Canadian Broadcasting Corporation, the Canadian Film Development Corporation (Telefilm Canada), the Canadian Radio-television and Telecommunications Commission, the National Arts Centre, the National Film Board, the National Library of Canada, the four National Museums, and the National Archives of Canada. These agencies have roles and responsibilities which have a bearing on Canadian cultural communities and Canadian national telecommunications. Departmental responsibilities are also concerned with the cultural portfolio as a whole. That is, the Government has the responsibility for establishing broad policies for issues of national importance, and ensuring that the broad policy orientations of the cultural agencies are consistent with Government objectives. The Government must periodically evaluate agency missions and progress towards the achievement of these missions. The Minister must also be able to respond to Parliament for the resources entrusted to the portfolio agencies.

Technology and Research

Formulates policies for the development of the national communications system, including radio, wire, cable, and satellite-based systems; conducts research and disseminates information on new technologies and services; promotes the use of new telecommunications and informatics technology by the private and public sectors; and, through the Government Telecommunications Agency, provisions telecommunications services and facilities that satisfy the requirements of federal departments and agencies at the lowest possible cost.

Spectrum Management and Regional Operations

Manages both the interference-free use and development of the radio spectrum nationally, and, through international agreements and regulations, protects Canada's rights regarding the use of spectrum, and manages departmental operations in all regions of Canada.

Cultural Affairs and Broadcasting

Fosters an environment in which Canada's heritage is preserved and made accessible, artistic expression can flourish, cultural markets can develop and Canadian audiences have increased access to cultural products and services.

Corporate Policy and Management

Includes the planning, international relations, federal-provincial relations, information services, program evaluation and audit elements; provides support and advice to the Minister and to all employees to ensure they carry out the Department's mission through proper management and control.

The department is organized to discharge these responsibilities as follows:
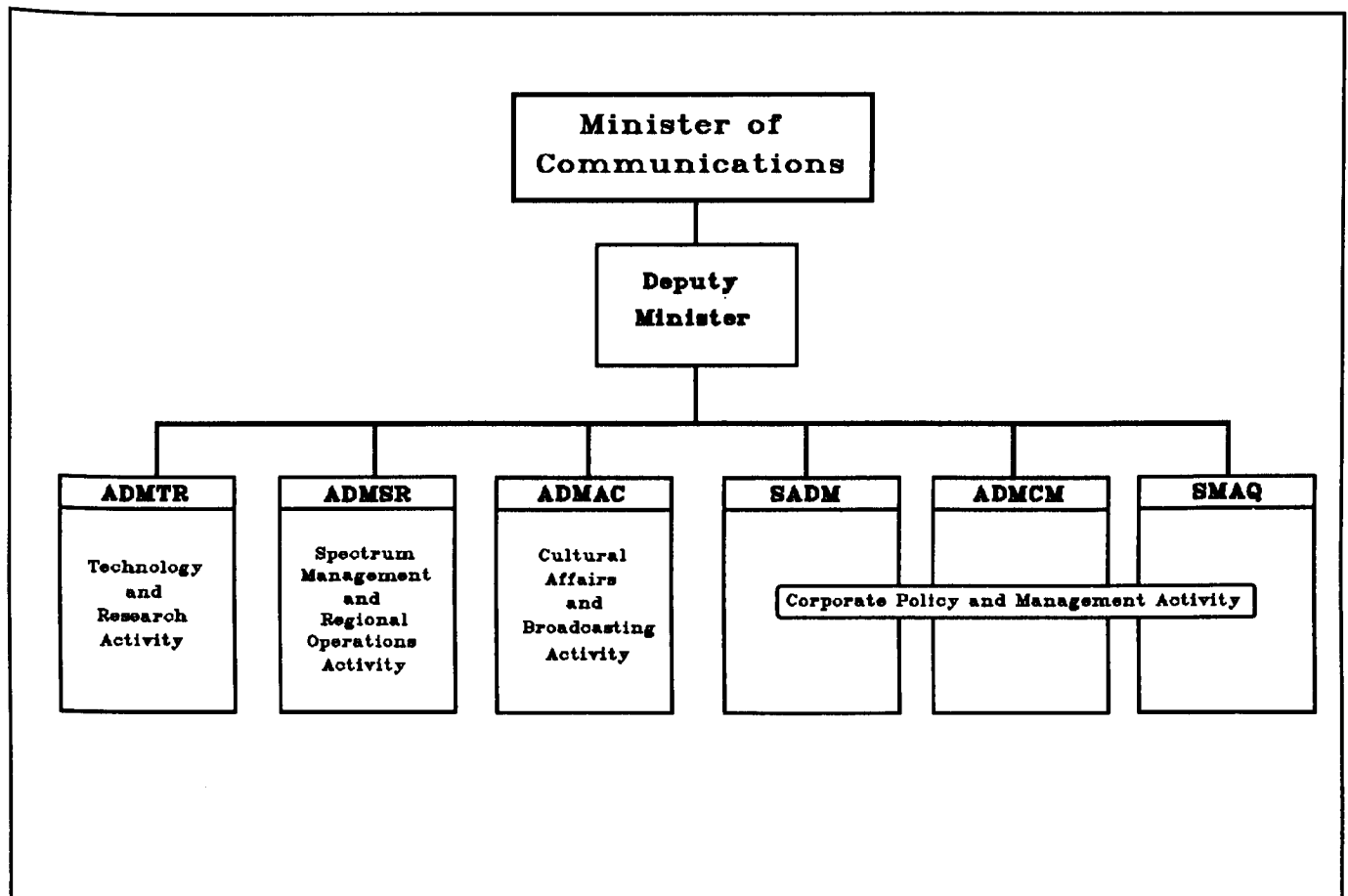
The following charts provide an overview of the program's resource profile for the past five years.

While a steady increase in appropriations has been realized, this has been more than offset by increased demands for program delivery, program diversification, inflationary pressures, and a decline in authorized person-years, in keeping with government downsizing trends.

Allocations for Corporate Policy and Management, and Spectrum Management and Regional Operations have increased marginally over time, with a decline in the funding of Technology and Research. A modest increase in Cultural Affairs and Broadcasting has been realized, with the major jump due to the addition of the Museums and Heritage subactivity to the Department.

Aside from specifically approved initiatives, future resourcing levels are expected to remain constant or decline, which will be further aggravated by inflation. These factors will combine to pose severe problems in coping with increased consumer demand and delivery of new programs.

DEPARTMENT OF COMMUNICATIONS
Program Resource Summary

Legend:
- Gross Expenditures
- Revenues (Incl GTA)
- Person-Years
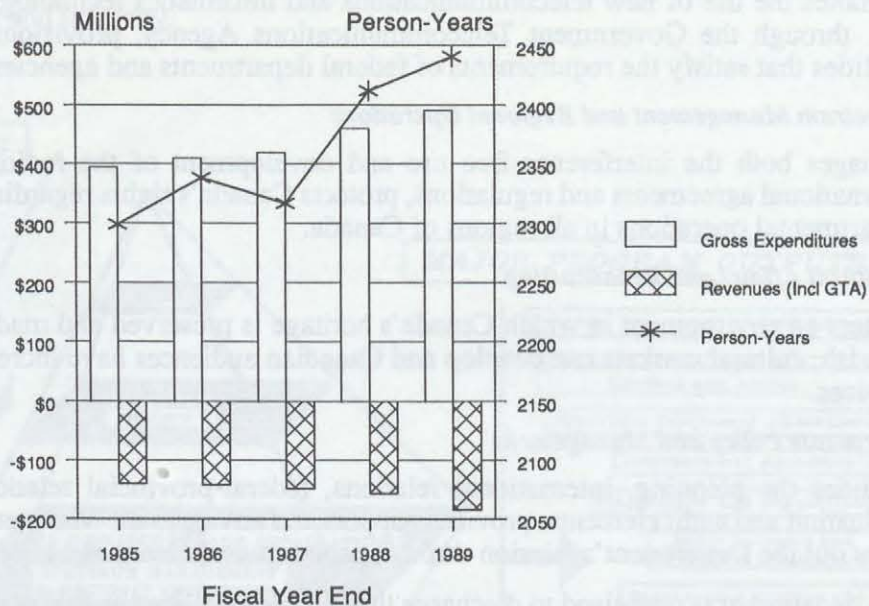
DEPARTMENT OF COMMUNICATIONS
DOC Gross Program Expenditure Summary
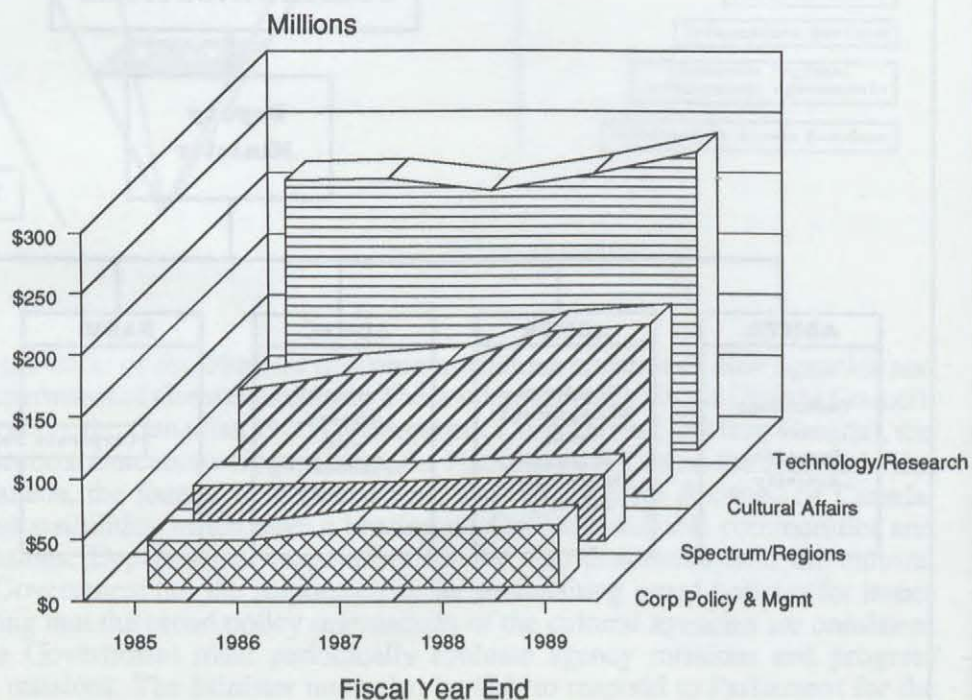
Technology/Research Includes GTA

A.3.1 ACTIVITY ANALYSIS - TECHNOLOGY AND RESEARCH

The objective of this activity is to foster the orderly development and use of communications, information and broadcast systems, services and infrastructure to meet Canadian economic, social and cultural needs.
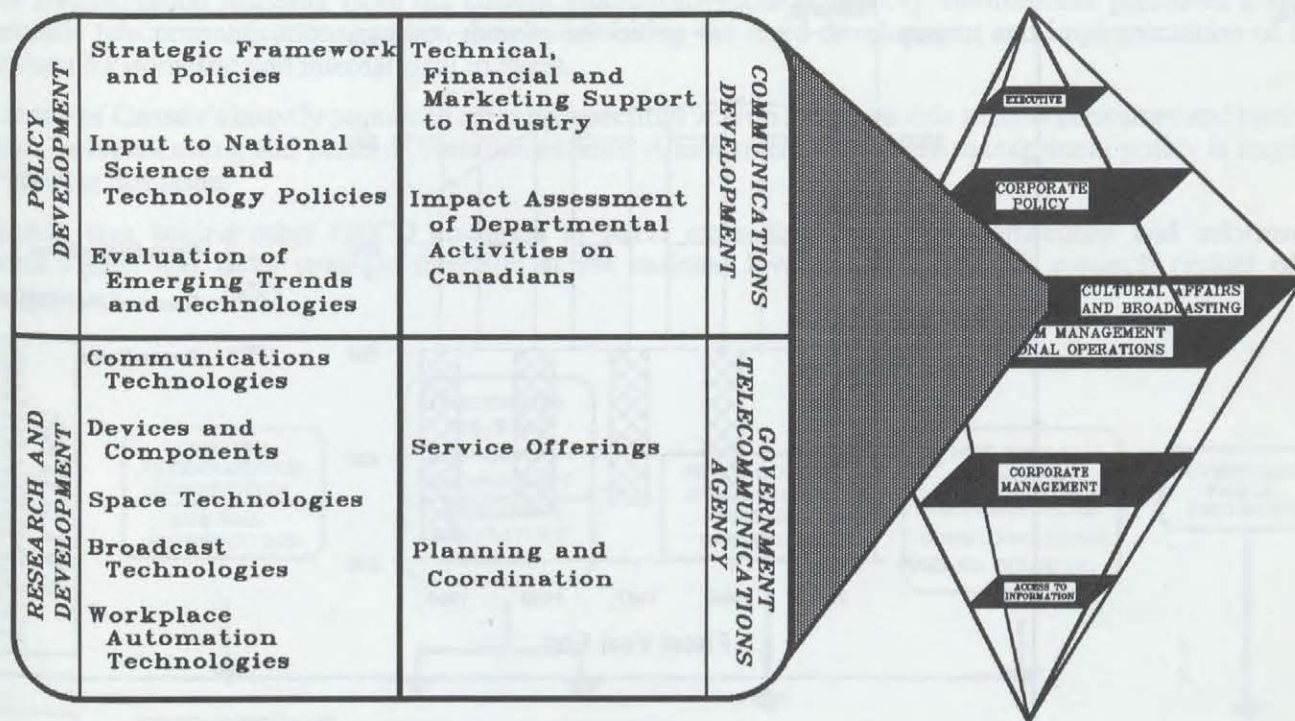
Policy Development

The strategic framework and direction for departmental efforts to improve and extend telecommunications and related services to all Canadians requires policies to be developed, promoted and safeguarded in international fora. This policy framework ensures that industry support efforts and research and development work are well focused and coordinated.

Research and Development

The department's research and development efforts assist in the advancement and development of the domestic industry, through the investigation of new technologies which appear promising but which are not yet competitive, the solution of problems and the advancement of knowledge in communications technologies. Research is undertaken in-house or through joint projects or partnerships with industry and universities.

Communications Development

Programs are offered to assist Canadian industry in the development and exploitation of advanced technologies which have significant market potential, or which meet the needs of specific groups. Specialized technical, financial and marketing support and assistance is provided to companies and other government departments and agencies on matters relating to the Canadian communications industry and its technologies.

Government Telecommunications Agency

The Minister is responsible for planning and coordinating telecommunications services for departments, branches and agencies of the Government of Canada. GTA meets this responsibility through the provision of a full range of telecommunications facilities and services, including shared and customized voice and data services; consulting services; directory services; and advice on the development, acquisition and management of systems and applications.

The following charts provide an overview of the activity's resource profile for the past five years.

TECHNOLOGY AND RESEARCH
Activity Resource Summary

Millions

Gross Expenditures
Revenues (Incl GTA)
Person-Years

Fiscal Year End

TECHNOLOGY AND RESEARCH
Gross Activity Expenditure Summary

Millions

GTA
R & D
Comm Development
Policy Development
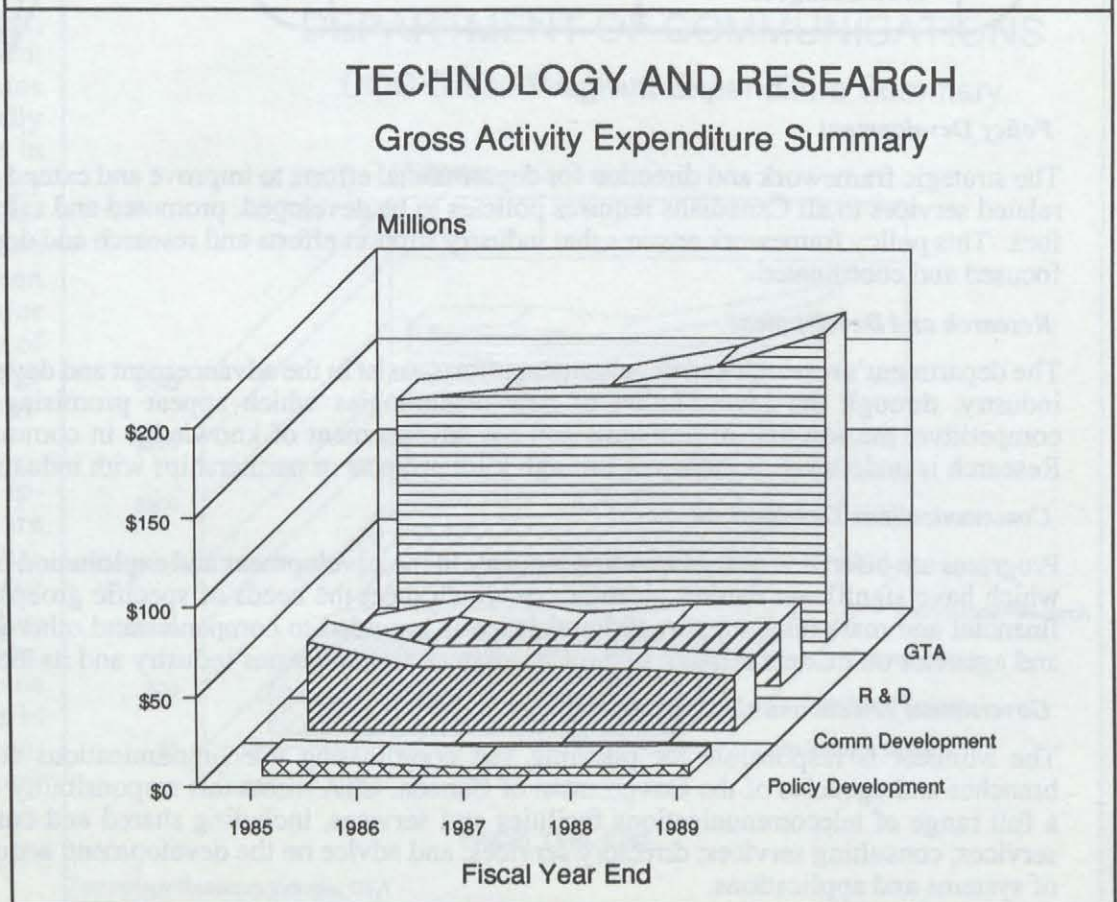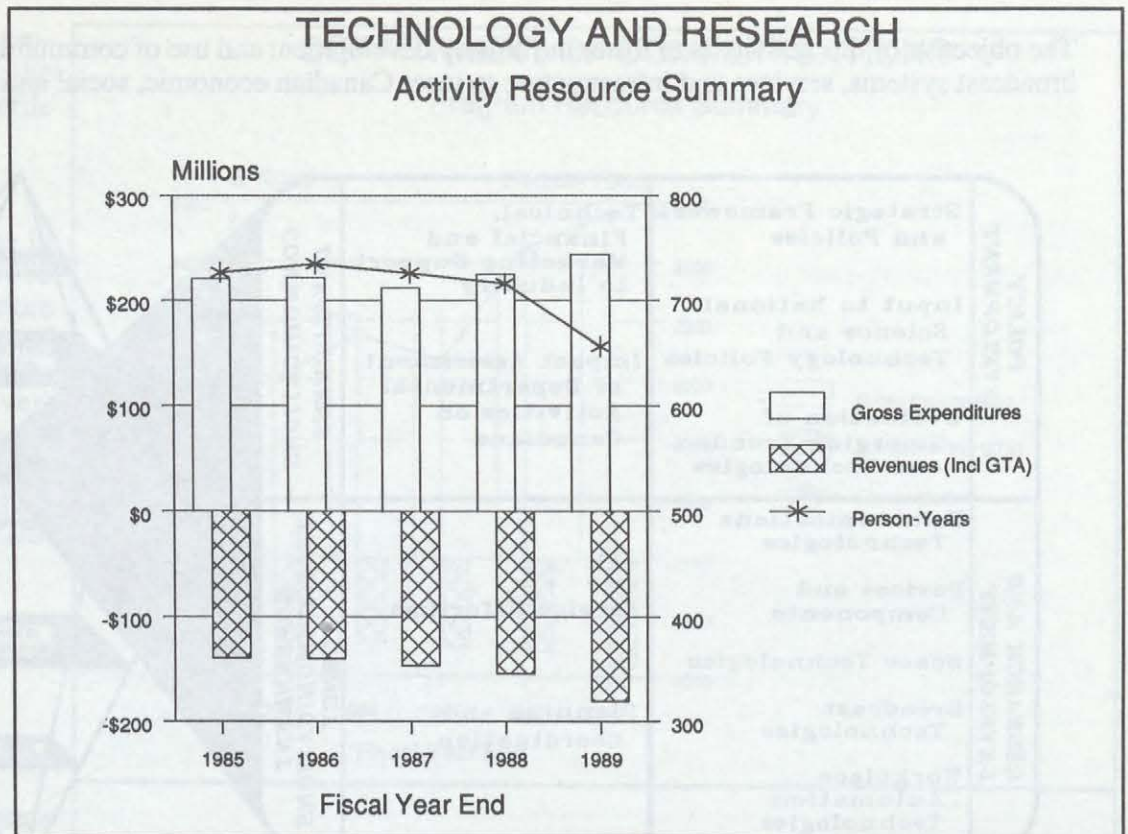
Fiscal Year End

New media challenge the current policy framework. These hybrid products have emerged in response to market shifts resulting from the technological convergence of computers, television, communications and publishing, and the erosion of traditional geographic frontiers in content transmission.

The fragmentation resulting from the current federal/provincial regulatory environment precludes a single domestic telecommunications market, thereby inhibiting the rapid development and implementation of new services for domestic and international markets.

In many of Canada's heavily populated areas the spectrum will no longer be able to meet consumer and business needs in broadcasting and personal communications. A new overall spectrum management policy is required to address this issue.

Canada lags behind other OECD countries in R&D expenditures on communications and information technologies, and lacks strategic direction at the national level for collaborative research typical of its competitors.
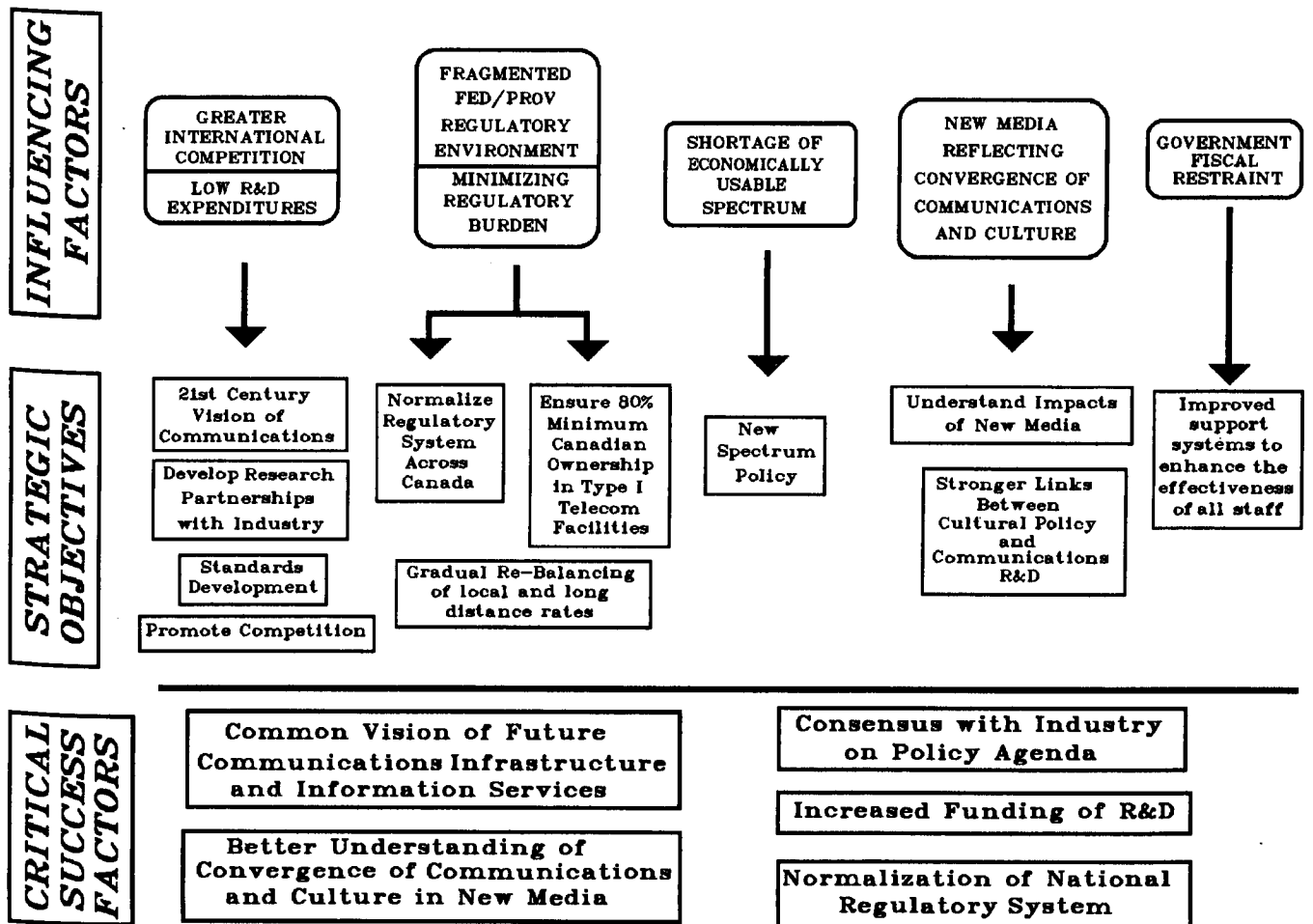
To ensure the successful achievement of these strategic objectives, it is essential that a common vision of future communications infrastructure and information services between government and industry. This vision must also incorporate a better understanding of the convergence of culture and communications in the new media, with industry concensus on the policy agenda to deal with new media. In addition, Canada must achieve increased funding of R&D, either through government or industry partnerships. Finally, normalization of the national regulatory system must be attained to ensure Canada's competitiveness in the international marketplace.

The radio frequency spectrum is that portion of the electromagnetic spectrum used for radio communications. It is a valuable natural resource, of significant economic, social and cultural benefit to Canadians, and a finite public resource, whose utilization is managed by DOC to ensure that optimum benefits accrue to Canadians. The overall objective of spectrum management is to ensure that present and future spectrum needs of all Canadians are met.
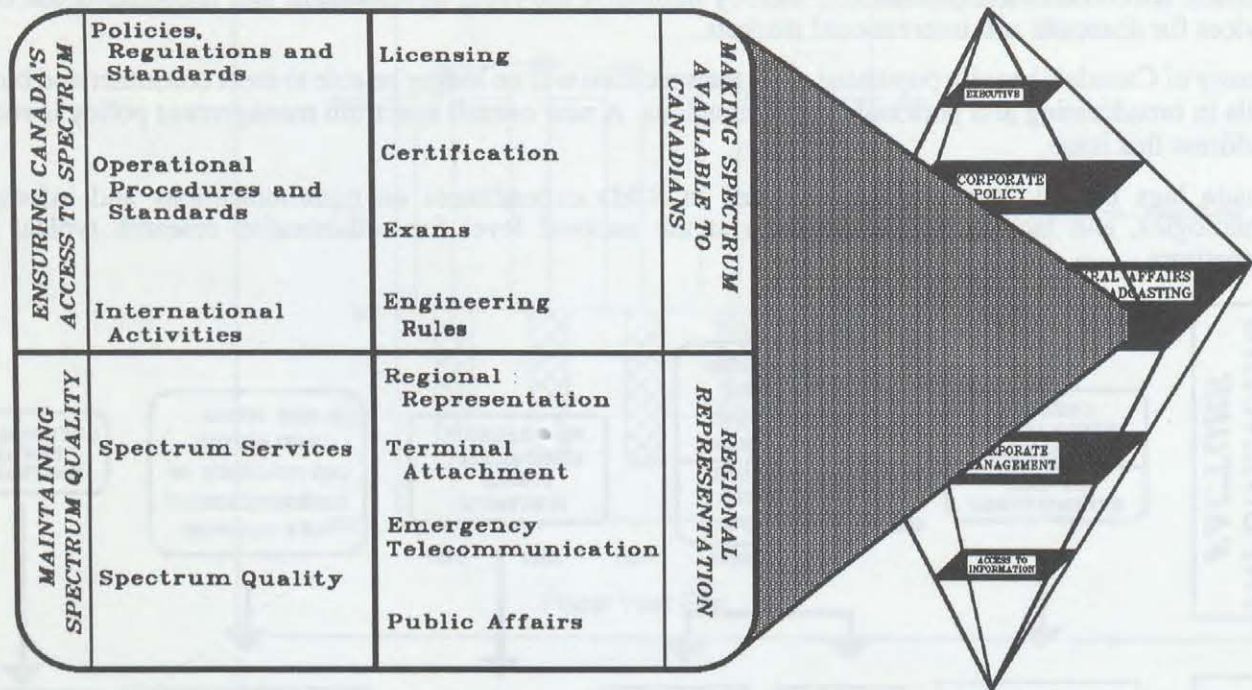
Ensuring Canada's Access to the Spectrum

International agreements and regulations are developed to ensure sufficient access to the technically usable portion of the radio frequency spectrum at the international level to meet our current and future needs.

Making the Spectrum Available to Canadians

The conditions of use of this acquired spectrum which will allow the accommodation of the maximum number of users with a minimum of interference are identified and communicated through legislation, regulations, policies, technical standards, plans and procedures to Canadians desirous of access to the spectrum. The continued development of technology also creates new opportunities for utilizing the spectrum, and these are accommodated and encouraged where benefits are anticipated. The department makes the spectrum available to qualified Canadian applicants through the assignment of frequencies and the issuance of broadcast construction and operating certificates and licences where applicable.

Maintaining Spectrum Quality

Licensing conditions and technical rules are policed so that those granted access to the spectrum operate without causing harmful interference to other spectrum users.

Regional Representation

Regional representation for other activities of the department in all regions of Canada is provided, ensuring public access to the department as a whole and to its programs. This network of offices implements departmental policies and programs, and provides regional, provincial and local perspectives to the development of departmental policies. In addition, this sub-activity is responsible for developing and implementing a national emergency telecommunications strategy to ensure the continuance of essential civil telecommunications in times of crisis, and for developing national standards for direct attachment of terminals to telecommunications networks.

The following charts provide an overview of the activity's resource profile for the past five years.

While allocations by subactivity and annual funding levels have remained constant, or increased marginally, actual resources have declined in real terms when inflation is taken into account.

The marked reduction in person years in keeping with government downsizing has not only maintained the quality and level of service, but also absorbed the excalation of consumer demand for radio communications (measured in terms of quantitative outputs and revenue generation) as well as the increased emphasis on regional representation of the activities of the other sectors of DOC.

This has been mainly accomplished through investments in information technology and effectiveness in personnel deployment, procedures and management.

SPECTRUM MANAGEMENT/REGIONAL OPERATIONS
Activity Resource Summary

Legend:
- Gross Expenditures
- License Receipts
- Person-Years
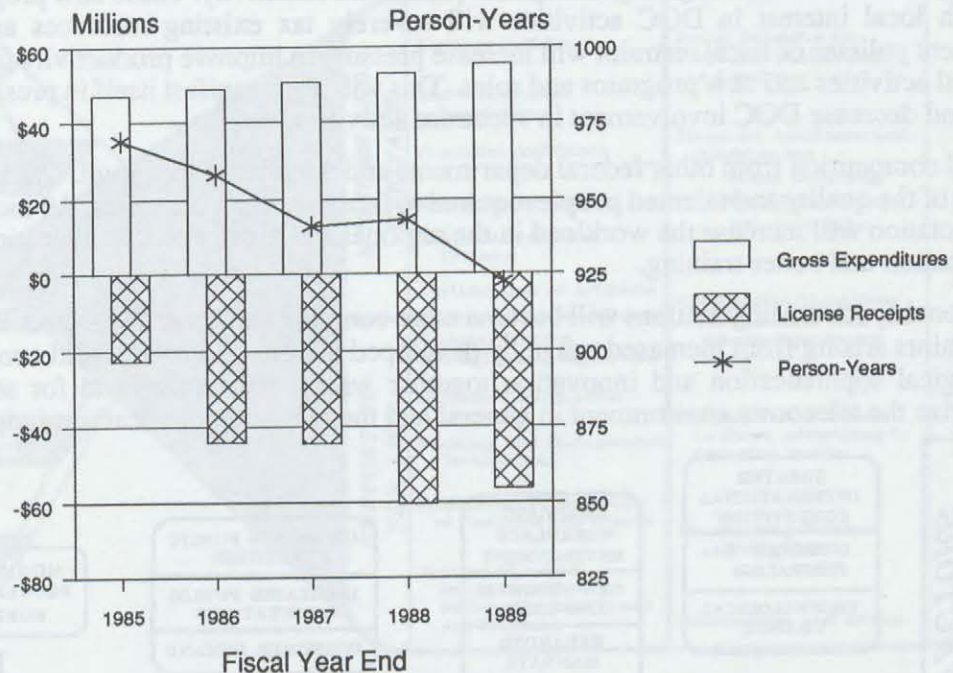
SPECTRUM MANAGEMENT/REGIONAL OPERATIONS
Activity Expenditure Summary

- Ensuring Access
- Spect Availability
- Maintaining Quality
- Non-Spect & Reg Ops
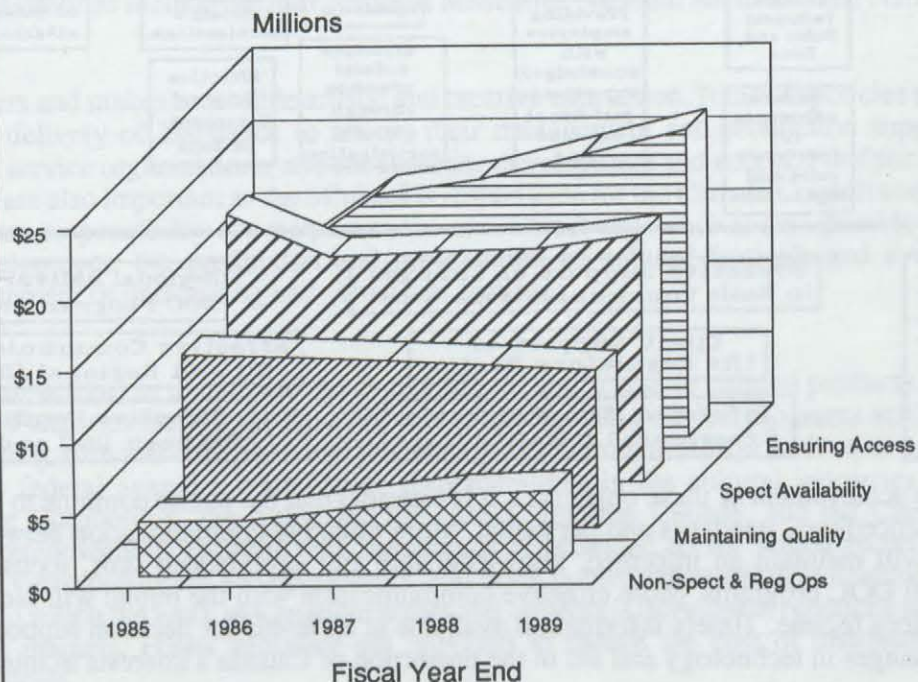
The departmental mission highlighting the convergence of communications and culture is clearly manifested in the regional and district office environment. The increased scope of this activity will incorporate not only the full range of DOC programs, but also necessitate closer collaboration with other federal, provincial and private sector initiatives through regional participation and sensitivity. These new programs and roles, coupled with high local interest in DOC activities will severely tax existing resources and systems. Continuing government policies of fiscal restraint will increase pressure to improve productivity in order to cope with both traditional activities and new programs and roles. This will also manifest itself in pressure to reduce regulatory burden and decrease DOC involvement in spectrum activities.

Increased competition from other federal departments and the private sector will challenge the recruitment and retention of the quality and talented people required to face mounting pressures. An increased public awareness and expectation will increase the workload in the regional and district offices, requiring improved distribution of information and better training.

International spectrum negotiations will become more complex and generally slower than in the past as a result of constraints arising from increased usage by developed nations and third world concerns. Rapid increase in technological sophistication and innovation together with a greater demand for services will continue to characterize the telecomm environment in general and the radio communications industry in particular.

INFLUENCING FACTORS

- GREATER INTERNATIONAL COMPETITION
- COOPERATIVE FEDERALISM
- TECHNOLOGICAL CHANGE

- CHANGING WORKPLACE ENVIRONMENT
- NEW PROGRAM AND ROLES
- EXPANDED MANDATE

- INCREASED PUBLIC AWARENESS
- INCREASED PUBLIC EXPECTATIONS
- CONSUMER DEMAND

- MINIMIZING REGULATORY BURDEN

- GOVERNMENT FISCAL RESTRAINT

STRATEGIC OBJECTIVES

- Anticipate Frequency Demands
- Provide Technical Rules and Tests
- Ensure adherence to frequency rules and regulations

- Effective Internal Communications
- Providing employees with knowledge & expertise to perform at expected level

- Equitable and Timely Access to Spectrum
- Effective federal presence through regional participation

- Continued availability of Government essential telecommunications
- Effective External Communications

- Orderly liberalization of terminal attachment

- Improved support systems to enhance the effectiveness and efficiency of all staff

CRITICAL SUCCESS FACTORS

- Proactive Support of Changes in Radio Communications Svcs
- Client Support of the Regulatory Regime
- Informed, Knowledgeable, Experienced, Credible Staff

- Regional Delivery of all DOC Program Activities
- Effective Communication Between HQ and Regional/District Offices
- Effective Communication Between DOC and the Public

To ensure the achievement of these objectives, it is essential that the public continue to perceive the credibility of policies, procedures, standards and personnel. More effective communication between all HQ groups and the regions will maintain an informed, knowledgeable and experienced staff, focusing on comprehensive delivery of all DOC programs. More effective communication with the public will facilitate industry support of the regulatory regime. Timely information available at all levels for decision support will permit proactive support of changes in technology and aid in the protection of Canada's interests in international fora.

The overall objective of this activity is to help create an environment in which Canada's heritage is preserved and made accessible, artistic expression can flourish, cultural markets develop, and Canadian audiences have increased access to cultural products and services, in particular to Canadian cultural products and services.

Pyramid labels (left to right):
EXECUTIVE
CORPORATE POLICY
TECHNOLOGY & RESEARCH
SPECTRUM MAN? & REGIONAL OPER?
CORPORATE MANAGEMENT
ACCESS TO INFORMATION

MUSEUMS AND HERITAGE

Heritage Policies

Legislation and Regulations

Financial Assistance

Technical Services

Public Information Systems

Certification of Artifacts

SUPPORT TO THE ARTS

National Policies, Strategies and Legislation

Portfolio Coordination

Training and Management Development

Production/Presentation of Festivals and Events

Construction and Improvement of Performing and Visual Art Facilities

CULTURAL INDUSTRIES

Postal Subsidies for Cultural Publications and Mailings

Financial Assistance and Subsidies for:
  Sound Recording
  Book Publishing
  Film and Video

Tax Benefits/Incentives for Canadian film and videotape producers

Tax and Tariff Policies to direct advertisers to Canadian media

Broadcasting Policies and Programs

Information and Advice

Museums and Heritage

This sub-activity is aimed at preserving Canada's cultural, social, industrial and natural heritage and making it accessible to Canadians. This is accomplished through the development of heritage legislation, policies and programs, and administration of these programs. In addition, it entails advising the Minister on heritage policies and programs across the federal cultural portfolio. The relevant agencies and corporations for which the Minister exercises special responsibilities include the four National Museums, National Archives, and National Library.

Support to the Arts

Support to the arts fosters and makes accessible artistic and creative expression. National policies and strategies are developed for the delivery of assistance to artists, their management and production support systems, representative national service organizations, and for audience development and access. Portfolio coordination and management tasks are also important as the Minister is responsible for the Canada Council and the National Arts Centre, which share responsibility for support to the arts. Direct assistance is also provided for training and management development, the production and presentation of cultural festivals and events, and the construction or improvement of performing and visual arts facilities.

Cultural Industries

The objective of this sub-activity is to increase the availability of and access to cultural products and services, Canadian in particular. Functions include the development of appropriate policies, programs and legislation in areas such as broadcasting, film and copyright, and the management of relationships with other agencies in the cultural portfolio. The federal agencies which share responsibilities in the cultural industries field are the Canadian Broadcasting Corporation, the National Film Board, Telefilm Canada, and the Canadian Radio-television and Telecommunications Commission. Assistance is provided to the sound recording industry, broadcasting, film and video producers and distributors, and book publishers to ensure a healthy environment and industry structure in which the work of Canadian artists and creators is developed, produced and distributed to the widest possible markets. Postal subsidies are provided to reduce the cost of distributing Canadian newspapers and periodicals.

The following charts provide an overview of the activity's resource profile for the past five years.

CULTURAL AFFAIRS AND BROADCASTING
Activity Resource Summary

Millions   Person-Years

Legend:
- Gross Expenditures
- Revenue/Receipts
- Person-Years

Fiscal Year End: 1985 1986 1987 1988 1989
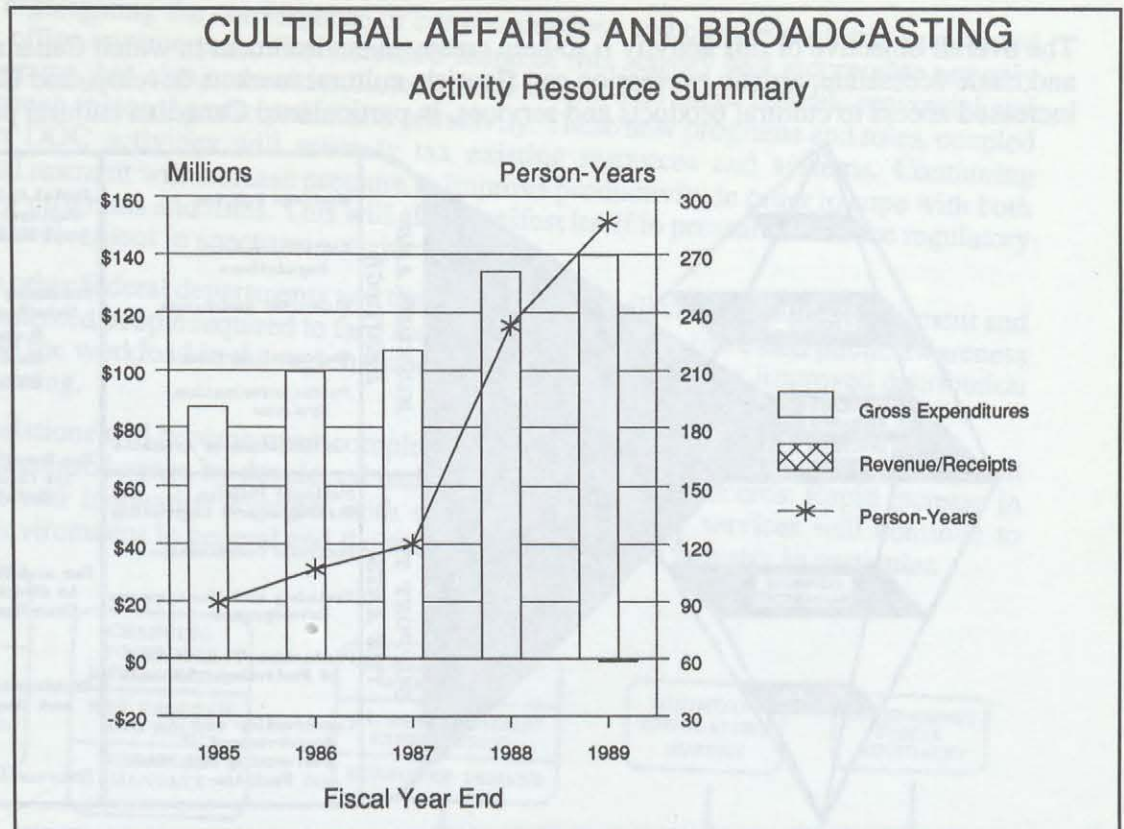
The integration of the Museums and Heritage sub-activity into the department is marked by the appearance of related expenditures in 1987/88.
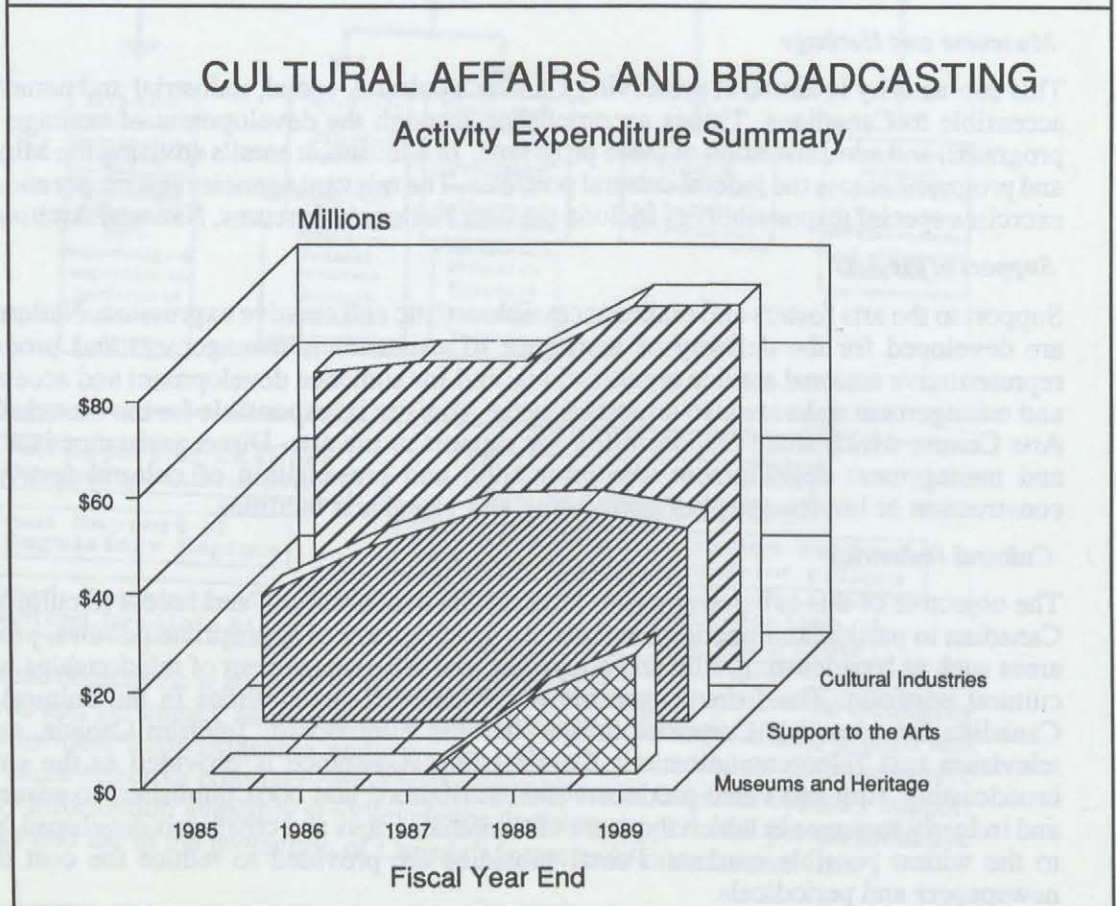
CULTURAL AFFAIRS AND BROADCASTING
Activity Expenditure Summary

Millions

- Cultural Industries
- Support to the Arts
- Museums and Heritage

Fiscal Year End: 1985 1986 1987 1988 1989

Greater public awareness of the importance of the role of Canadian culture and of the need for a distinctive Canadian identity has resulted from the Free Trade debate.

This has led to greater public recognition and support of the fundamental role and responsibility of the government in promoting and supporting the distinctiveness of Canadian culture through national and other measures.

In an era of fiscal restraint, the needs and problems of the cultural sector will have to be dealt with by measures that will increasingly require the use of alternative, innovative and diverse sources of funding, supported by appropriate policies and legislation.

The dynamics of the international marketplace in cultural and entertainment products results in a homogenization of products which is detrimental to the development and articulation of Canadian identity.

INFLUENCING FACTORS

PUBLIC RECOGNITION OF GOVERNMENT'S ROLE IN CULTURE

GREATER PUBLIC AWARENESS OF IMPORTANCE OF CANADIAN CULTURE AND DISTINCTIVE CANADIAN IDENTITY

HOMOGENIZATION IN THE INTERNATIONAL MARKETPLACE

NEW MEDIA REFLECTING CONVERGENCE OF COMMUNICATIONS AND CULTURE

GOVERNMENT FISCAL RESTRAINT

STRATEGIC OBJECTIVES

Proactive Policies to Support Arts Heritage and Broadcasting

Enhance Creative, Distribution and Self-Financing Capabilities of Commercial Production

Develop Distinct Canadian Domestic Audiences for Canadian Cultural Products

Develop an Adequate Cultural Infra-structure to Enhance Access to Capital Financing

Enhance the Promotion of Canadian Cultural Products

Understand Impacts of New Media

Stronger Links Between Cultural Policy and Communications R&D

Utilize Funding Programs of Other Government Departments and Agencies

CRITICAL SUCCESS FACTORS

Adequate Funding Available to Support the Two Major Cultures

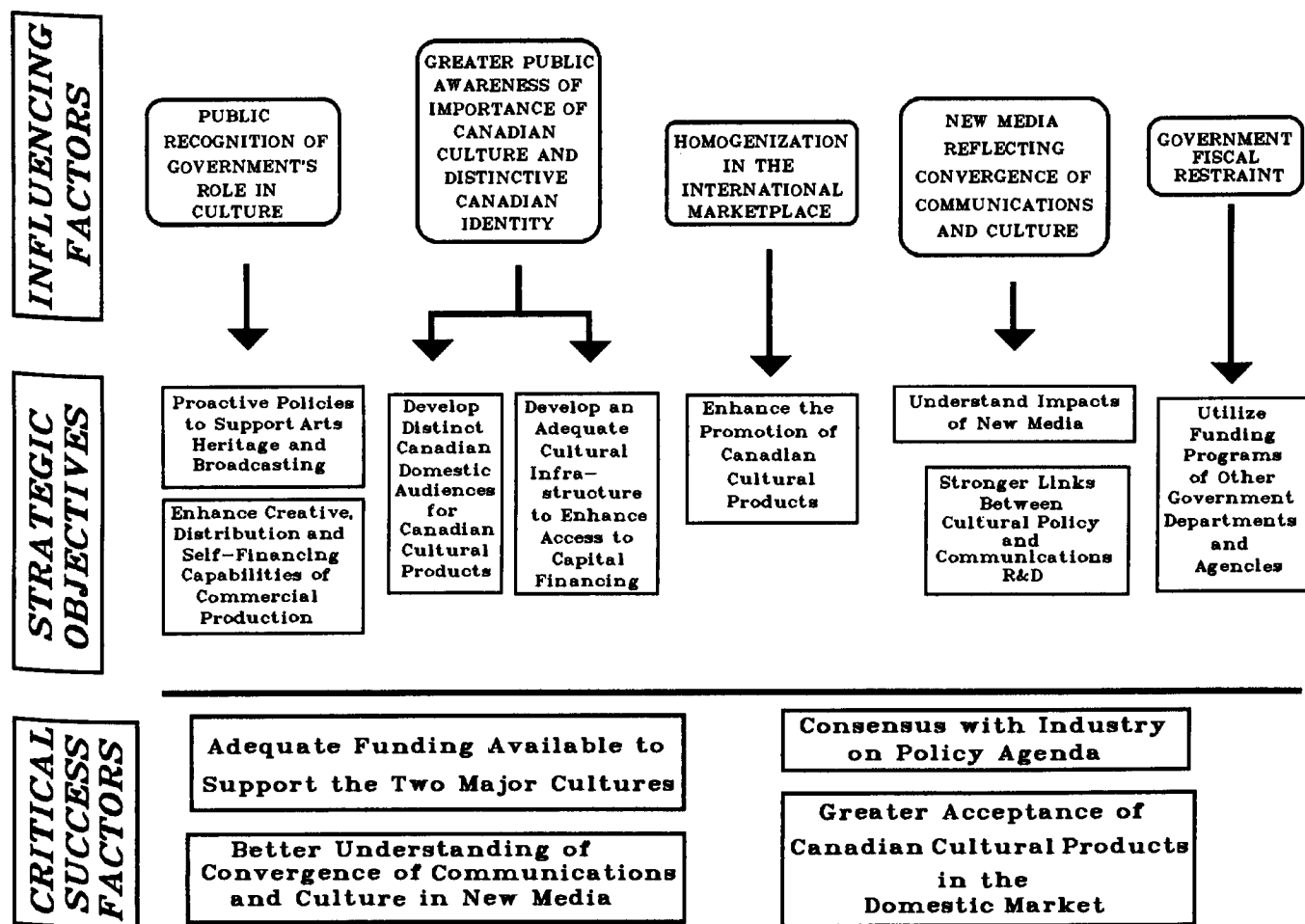Better Understanding of Convergence of Communications and Culture in New Media

Consensus with Industry on Policy Agenda

Greater Acceptance of Canadian Cultural Products in the Domestic Market

To ensure the successful achievement of these strategic objectives, a better understanding of the convergence of culture and communications in the new media, and how this is reflected in policies is critical. Also critical is the level of funding to be applied to support the two major cultures, with leveraging of other departments agencies in the funding of multicultural programs, and the level of acceptance of these Canadian cultural products in the domestic market..

A.3.4 ACTIVITY ANALYSIS - CORPORATE POLICY AND MANAGEMENT

This activity is responsible for providing the strategic focus and direction for departmental activities and programs, for managing the departmental relationship with other governments, both domestic and international, reviewing the effectiveness of existing policies and programs (and in conjunction with all sectors of the department, how they relate to the convergence between technology and culture), making the public aware of departmental policies and programs, ensuring that departmental resources are well managed, and providing a range of centralized and specialized services relating to domestic and international interests and activities.
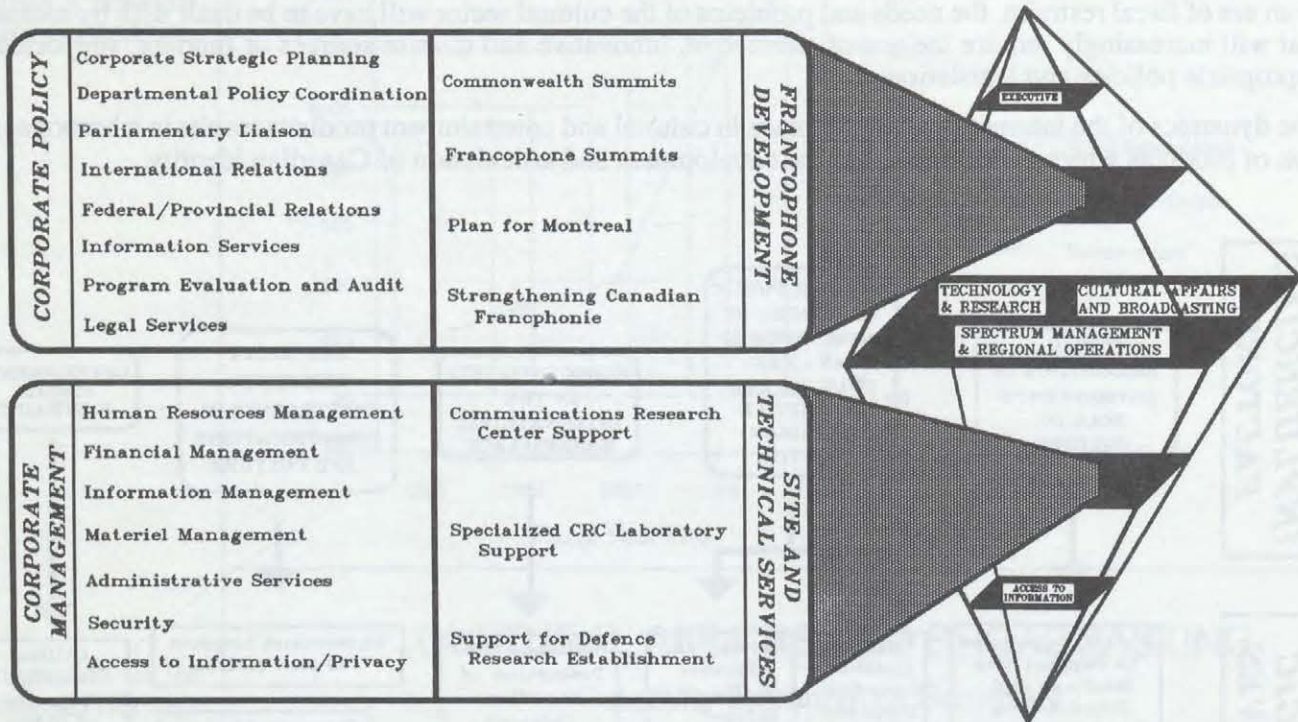
Corporate Policy

Corporate Policy is responsible for managing the planning, development, implementation and communication of policies, legislation and programs, both domestically and internationally. This involves directing the corporate strategic planning process, coordinating departmental policy endeavours, and managing legislation, parliamentary business and liaison with Cabinet and the central agencies in order to facilitate successful consideration of the Minister's initiatives by Cabinet and Parliament. The department's heavy involvement in high profile Francophone and Commonwealth summits requires a sustained effort by the department.

Corporate Management

Corporate Management provides a range of common services aimed at ensuring that the department has the resources it needs to fulfil its mandate. Resources include staff, information, finance, materials and office accommodations. It also includes the provision of advice to the Minister on financial and administrative matters within the portfolio.

Site and Technical Services

The site and technical services sub-activity is responsible for providing operational and maintenance support systems for the Communication Research Centre (CRC) at Shirley's Bay. These include a central heating and cooling plant, central garage and repair services, operations and maintenance of all structures and buildings, capital construction, and office supplies, services and equipment to meet operational needs. In addition, technical and operational support for the CRC laboratory and test facility equipment, and technical expertise and special support services for research projects are provided. The requirements of the technical and site services at the CRC are complex, demanding and in many instances, unique. This is a world class laboratory which demands highly skilled technical support services, which cannot be readily supplied by the private sector.

The following charts provide an overview of the activity's resource profile for the past five years.

CORPORATE POLICY AND MANAGEMENT
Activity Resource Summary
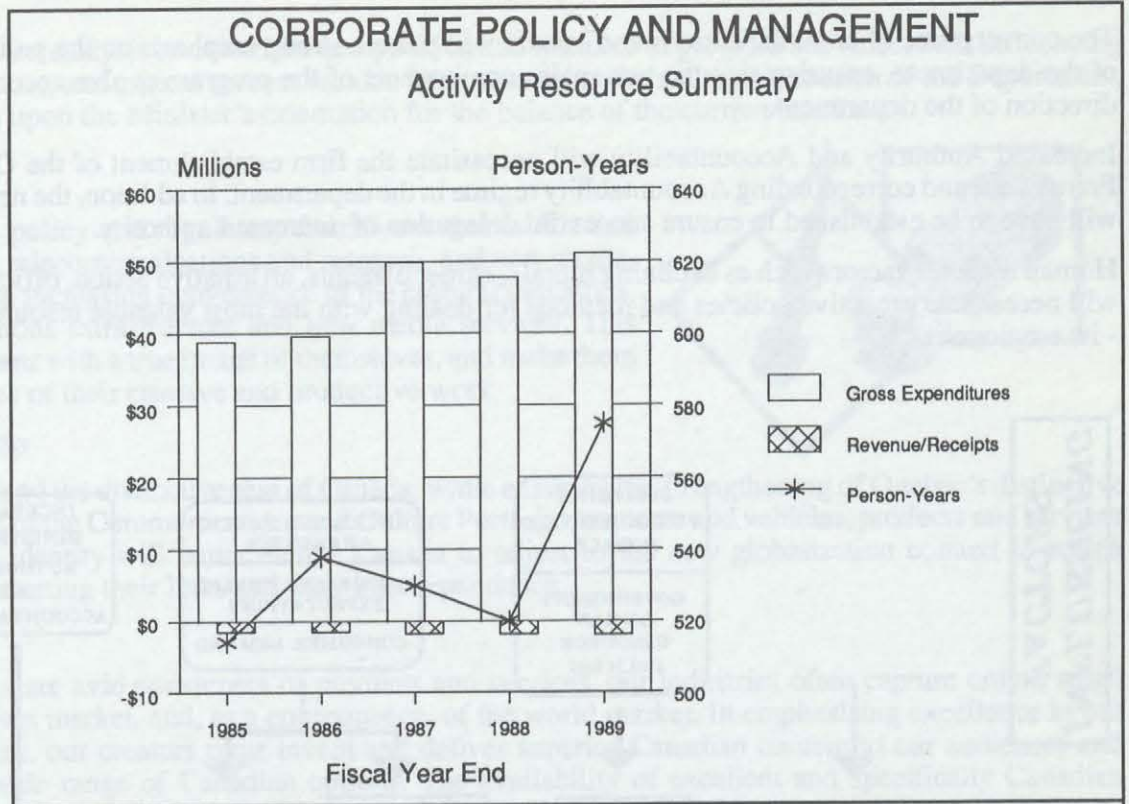
The sudden drop in expenditures in the corporate management sub-activity in 1987/88 was a result of the creation of a separate sub-activity for Communications Research Center Site and technical Services.
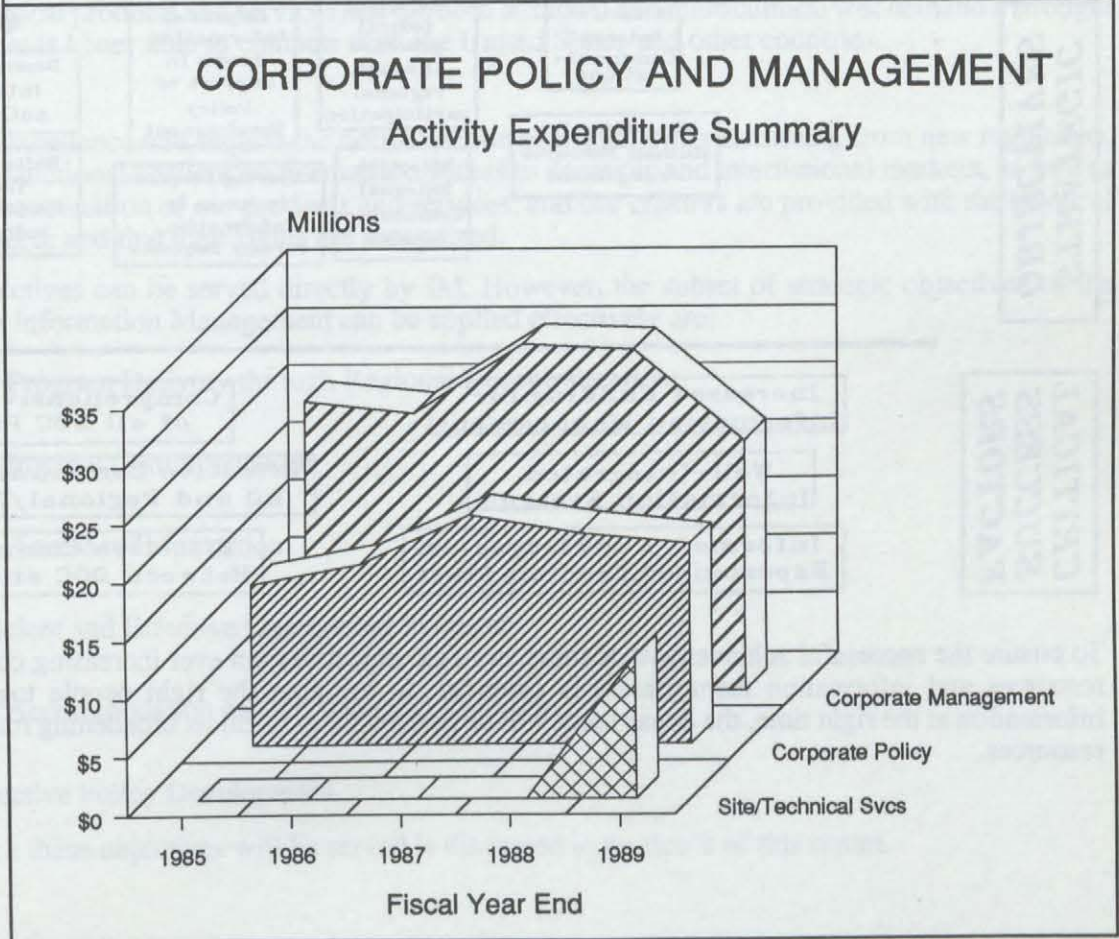
CORPORATE POLICY AND MANAGEMENT
Activity Expenditure Summary

The convergence of communications and culture will place a strong emphasis on the policy coordination role of the department, ensuring that the two major components of the program evolve according to the strategic direction of the department.

Increased Authority and Accountability will necessitate the firm establishment of the Operational Planning Framework and corresponding Accountability regime in the department. In addition, the necessary mechanisms will have to be established to ensure successful delegation of increased authority.

Human resource factors such as declining morale, career plateaus, affirmative action, official language policies will necessitate proactive policies and methods for dealing with the most valuable resource of the department - its employees.

INFLUENCING FACTORS

- DECLINING PUBLIC SERVICE MORALE / GOVERNMENT HUMAN RESOURCE POLICIES
- INCREASED PUBLIC AWARENESS / INCREASED PUBLIC EXPECTATIONS / CONSUMER DEMAND
- INCREASED MINISTERIAL AUTHORITY AND ACCOUNTABILITY
- GOVERNMENT FISCAL RESTRAINT

STRATEGIC OBJECTIVES

- Effective Internal Communications
- More Effective Human Resource Management
- Effective federal presence through regional participation
- Effective External Communications
- Improved Information Access in Support of Policy Development
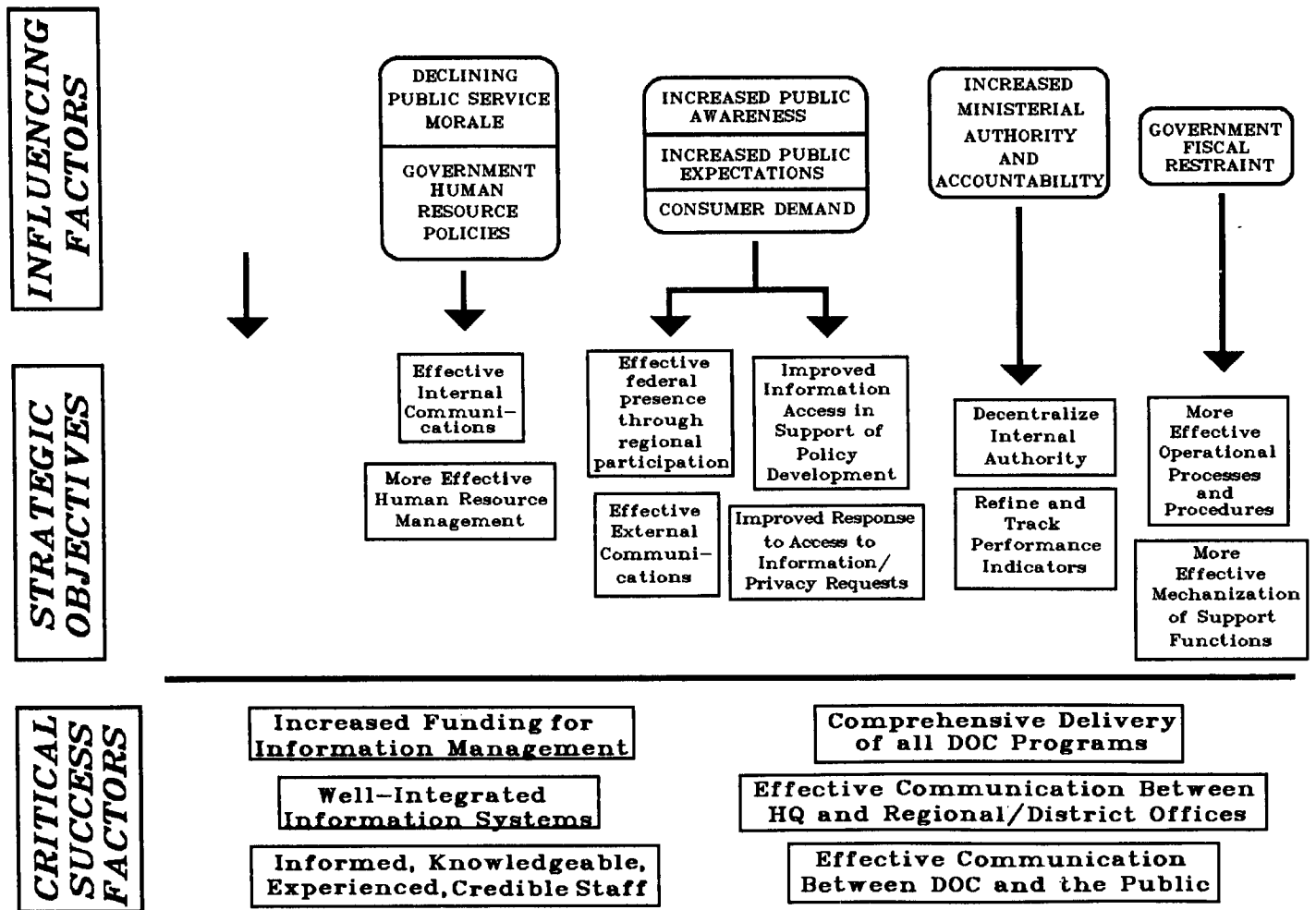- Improved Response to Access to Information/ Privacy Requests
- Decentralize Internal Authority
- Refine and Track Performance Indicators
- More Effective Operational Processes and Procedures
- More Effective Mechanization of Support Functions

CRITICAL SUCCESS FACTORS

- Increased Funding for Information Management
- Well-Integrated Information Systems
- Informed, Knowledgeable, Experienced, Credible Staff
- Comprehensive Delivery of all DOC Programs
- Effective Communication Between HQ and Regional/District Offices
- Effective Communication Between DOC and the Public

To ensure the successful achievement of these strategic objectives, an ever increasing commitment to human resources and information management is essential. In bringing the right people together with the right information at the right time, the department will be better able to fulfill its broadening mandate with declining resources.

A.4 STRATEGIC OBJECTIVES

The preceding program analysis reviewed the composition and mandate of program activities, their influencing factors, strategic thrusts, and critical success factors. In summarizing the strategic direction of the Department, it is useful to reflect upon the Minister's orientation for the balance of the current mandate:

Nation Building

A clearly Canadian policy and regulatory framework that is fair and equitable in culture, telecommunications and research, and new media, which recognizes the increasing convergence of the cultural industries, the telecommunications infrastructure and new media services. This will provide Canadians with a true image of themselves, and make them primary beneficiaries of their creative and productive work.
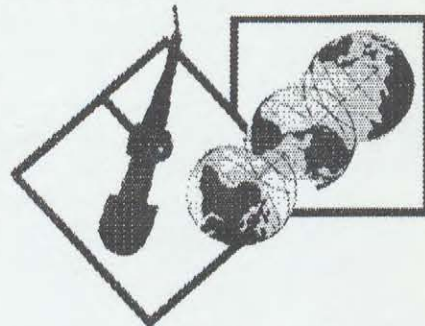
The Canadian Identity

To maintain and defend the distinctiveness of Canada, while ensuring the strengthening of Quebec's distinctive character in all areas of the Communications and Culture Portfolio, contents and vehicles, products and services alike. A distinctive identity will better enable Canada to adjust to the new globalization context in which countries are strengthening their links and their interdependence.

Excellence

Although Canadians are avid consumers of products and services, our industries often capture only a small percentage of our own market, and, as a consequence, of the world market. In emphasizing excellence in our products and services, our creators must invent and deliver superior Canadian content to our audiences and guarantee them a wide range of Canadian options. The availability of excellent and specifically Canadian cultural and technological products and services that are both bilingual and multicultural will demand a stronger Canadian industry that is better able to compete with the United States and other countries.

Normalization

The achievement of excellence will require the normalization of irregularities stemming from new regulation, deregulation and jurisdictional challenges; normalized access to domestic and international markets, as well as the distribution or dissemination of our products and services; and our creators are provided with the physical resources that they need, and that their rights are recognized.

Not all of these objectives can be served directly by IM. However, the subset of strategic objectives of the department to which Information Management can be applied effectively are:

- Improved Program Delivery through Regional Decentralization

- Improved Internal Communication

- Improved Access to Information

- More Efficient and Effective Operational Systems

- Proactive Accommodation of Technological Changes

- More Effective Policy Development

The manner in which these objectives will be served is discussed in section 8 of this report.

APPENDIX B
TABLES

APP. B - TABLE 1.0 - PROGRAM RESOURCE SUMMARY

	1984/85	1985/86	1986/87	1987/88	1988/89
FINANCES BY ACTIVITY ($000)					
Technology and Research (Net GTA)	220,436	222,071	211,652	225,318	243,819
Spectrum Mgmt / Regional Operations	47,005	48,767	50,554	52,925	55,309
Cultural Affairs and Broadcasting	86,994	99,521	106,849	133,991	139,637
Corporate Policy and Management	38,800	39,495	49,787	47,730	51,026
Gross Program Expenditures	**393,235**	**409,854**	**418,842**	**459,964**	**489,791**
GTA Revenues	-135,219	-140,521	-142,045	-150,338	-177,159
Non-GTA Revenues	-6,053	-6,310	-6,736	-6,797	-6,448
Net Program Expenditures	**251,963**	**263,023**	**270,061**	**302,829**	**306,184**
FINANCES BY OBJECT ($000)					
Personnel	85,052	91,941	97,347	105,455	108,781
Goods and Services (Net GTA)	96,552	97,383	90,629	93,448	89,809
Capital	24,904	21,876	13,470	11,980	18,239
Transfer Payments	45,455	51,823	68,615	91,936	89,351
Non-Budgetary Loans	0	0	0	10	4
Net Program Expenditures	**251,963**	**263,023**	**270,061**	**302,829**	**306,184**
Non-GTA Receipts to Consol. Rev.	**-26,566**	**-49,371**	**-49,704**	**-71,623**	**-63,416**
PERSON-YEARS					
Technology and Research	727	735	726	716	657
Spectrum Mgmt. & Regional Operations	969	958	941	943	922
Cultural Affairs & Broadcasting	89	107	120	233	278
Corporate Policy and Management	514	538	530	520	571
Total Program Person-Years	**2,299**	**2,338**	**2,317**	**2,412**	**2,428**

Source: DOC Estimates Part III for year: 1986/87   1987/88   1988/89   1989/90   1990/91

APP. B - TABLE 2.0 - PROGRAM IT RESOURCE SUMMARY

	1984/85	1985/86	1986/87	1987/88	1988/89
IT FINANCES BY OBJECT ($000)					
Personnel	8,801	10,207	10,744	13,198	13,607
Goods and Services	8,114	7,898	10,020	10,725	12,398
Capital	3,644	5,430	4,779	4,307	6,935
Program IT Expenditures	**20,559**	**23,535**	**25,543**	**28,230**	**32,940**
IT FINANCES BY TYPE ($000)					
Personnel	8,801	10,207	10,744	13,198	13,607
Professional Services (O&M)	1,272	1,256	843	1,124	1,682
Facilities Management (O&M)	0	0	0	0	0
Service Bureau (O&M)	2,486	2,329	2,638	3,543	3,537
Government Services (O&M)	153	147	203	277	202
Software Acquisition (O&M)	453	389	1,358	1,013	2,182
Software Support (O&M)	0	13	106	138	245
Hardware Acquisition (O&M)	886	398	636	406	532
Hardware Rental (O&M)	1,143	1,517	1,339	1,778	877
Hardware Support (O&M)	1,134	892	2,011	1,262	1,536
Environment Support (O&M)	0	4	33	30	26
Supplies (O&M)	75	249	0	115	256
Telecommunications - Data (O&M)	512	704	853	1,039	1,323
Hardware Acquisition (Capital)	3,224	5,067	4,354	4,049	6,543
Other Acquisitions (Capital)	420	363	425	258	392
Program IT Expenditures	**20,559**	**23,535**	**25,543**	**28,230**	**32,940**
IT FINANCES BY ACTIVITY ($000)					
Technology and Research	7,646	11,043	9,203	10,122	12,400
Spectrum Mgmt / Regional Operations	6,992	6,507	7,093	7,299	8,334
Cultural Affairs and Broadcasting	323	840	809	4,549	4,465
Corporate Policy and Management	5,597	5,145	8,439	6,259	7,741
Program IT Expenditures	**20,559**	**23,535**	**25,543**	**28,230**	**32,940**
IT PERSONNEL EXPENSE BY ACTIVITY					
Technology and Research	1,967	3,013	3,172	3,290	3,414
Spectrum Mgmt / Regional Operations	3,595	3,785	3,984	4,143	4,285
Cultural Affairs and Broadcasting	228	240	253	2,288	2,357
Corporate Policy and Management	3,010	3,169	3,336	3,476	3,551
Program IT Personnel Expense	**8,801**	**10,207**	**10,744**	**13,198**	**13,607**
IT P-Ys BY TYPE					
Computer Systems Administration	66	71	71	93	93
Data Processing	6	8	8	8	7
Administrative Services	34	38	38	40	40
Other	18	20	20	21	21
Program IT Person-Years	**124**	**137**	**137**	**162**	**161**

APP. B - TABLE 3.0 - PROGRAM IT INDICATORS

	1984/85	1985/86	1986/87	1987/88	1988/89
IT Expense Annual Growth (%)		12.6%	7.9%	9.5%	14.3%
Program Expense Annual Growth (%)		4.1%	2.1%	8.9%	6.1%
IT Expense / Program Expense (%)	5.2%	5.7%	6.1%	6.1%	6.7%
IT P-Y Annual Growth (%)		9.5%	0.0%	15.4%	-0.6%
Program P-Y Annual Growth (%)		1.7%	-0.9%	3.9%	0.7%
IT Person-Years / Program P-Ys (%)	5.4%	5.9%	5.9%	6.7%	6.6%
IT Expense per Program P-Y ($000)	8.94	10.07	11.02	11.70	13.57
Portion of IT Expense In-House (%)	86.1%	87.9%	91.1%	90.4%	87.8%
GTA Telecom / Total Telecom (%)					
Activity IT Exp / Activity Exp (%)					
Telecom Research & Technology	3.5%	5.0%	4.3%	4.5%	5.1%
Spectrum Mgmt. & Regional Ops	14.9%	13.3%	14.0%	13.8%	15.1%
Cultural Affairs and Broadcasting	0.4%	0.8%	0.8%	3.4%	3.2%
Corporate Policy and Management	14.4%	13.0%	16.9%	13.1%	15.2%
Activity IT Exp / Program IT Exp (%)					
Telecommunications & Informatics	37.2%	46.9%	36.0%	35.9%	37.6%
Spectrum Mgmt. & Regional Ops	34.0%	27.6%	27.8%	25.9%	25.3%
Cultural Affairs and Broadcasting	1.6%	3.6%	3.2%	16.1%	13.6%
Corporate Policy and Management	27.2%	21.9%	33.0%	22.2%	23.5%
Activity IT Exp / Activity P-Y ($000)					
Telecommunications & Informatics	10.52	15.02	12.68	14.14	18.87
Spectrum Mgmt. & Regional Ops	7.22	6.79	7.54	7.74	9.04
Cultural Affairs and Broadcasting	3.63	7.85	6.74	19.53	16.06
Corporate Policy and Management	10.89	9.56	15.92	12.04	13.56

APPENDIX C
GLOSSARY

APPENDIX C. GLOSSARY

ADM: Assistant Deputy Minister

ADMAC: Assistant Deputy Minister, Cultural Affairs and Broadcasting

ADMCM: Assistant Deputy Minister, Corporate Management

ADMSR: Assistant Deputy Minister, Spectrum Management and Regional Operations

ADMTR: Assistant Deputy Minister, Technology, Research and Telecommunications

AES: Prior supplier of word processing equipment. Now used to relate to the technology of AES.

ALS: Assignment and Licensing Sub-system

AMAX: Assets Management System

AMIS: Administrative Management Information System

A/P: Accounts Payable

API: Application Program Interface

A/R: Accounts Receivable

ARCS: Allotment Reporting and Control System

ARES: Bull's Relatonal Data Base Management System for CP6

ATIP: Access to Information and Privacy

BAS: Broadcast Analysis System

CASE: Computer Aided Systems/Software Engineering

CAVCO: Canadian Audio-visual Certification Office

CCI: Canadian Conservation Institute

CCS: Correspondence Control System

CDC: Control Data Corporation manufacturer of CYBER equipment used by CHIN

CDS: Call Detail System

CHIN: Canadian Heritage Information Network

CICS: A pre-processing data base package for IBM mainframes

CIN: Conservation Information Network

CN/CP: Canadian National/Canadian Pacific Telecommunications supplier

CNS: Corporate Network Server (by Banyan)

CP6: Operating System for Bull DPS8/70 equipment

CPU: Central Processing Unit

CRAD: Chief, Research and Development (DND)

CRB: Contract Review Board

CRC: Communications Research Centre at Shirleys Bay

CSE: Communications Security Establishment (DND)

CWARC: Canadian Workplace Automation Research Centre

DATAPAC: Telecom Canada Packet-switched data communication service

DBMS: Data Base Management System

DCS: Director, Components and Subsystems

DEC: Digital Equipment Corporation

DEC/VMS: Specific Proprietary Environment

DG: Director General

APPENDIX C. GLOSSARY

DGAT: Director General, Administrative and Technical Services

DGBT: Director General, Broadcast Technologies Research (CRC)

DGCD: Director General, Communications Devices and Components Research (CRC)

DGIM: Director General, Informatics Management

DGRC: Director General, Communications Technologies Research (CRC)

DISO: Departmental Individual Standing Offer

DM: Deputy Minister

DO: District Offices

DOC: Department of Communications

DOS: Disk Operating system

DND: Department of National Defence

DPMS: Departmental Personnel Management System

DPS8/70: Mainframe supplied by Bull

DPS6: Minicomputer supplied by Bull

DREO: Defence Research Establishment - Ottawa

DRL: Director, Radio Communications Technologies

DSAT: Director, Satellite Communications

DSM: Director, Space Mechanics

DSS: Department of Supply and Services

DTS: Table-top Banyan server

ECU: Executive Correspondence Unit

EDP: Electronic Data Processing

EEWD: Extended Exchange Wide Dial (Bell Canada) System

EIS: Executive Information System

EMC: Electromagnetic Compatibility

FCC: Federal Communication Commission

FIS: Financial Information System

FMIS: Financial Management Information System

FY: Fiscal Year

GCI: Getty Conservation Institute

GCOS8: Bull's mainframe Operating System

GEAC: Canadian Computer Manufacturer

GEM: Government Electronic Messaging services

GEMDES: Government Electronic Messaging and Document Exchange Service

GL: General Ledger

GOULD: Minicomputer supplier and manufacturer - now known as Encore Systems

GPN: Government Packet Network

GRLS: General Radio Licensing System

GTA: Government Telecommunications Agency

GTAFIS: Government Telecommunications Agency Financial Information System

APPENDIX C. GLOSSARY

GTMIS: Government Telecommunications Agency Management Information System

GUI: Graphical User Interface

HQMIS: Head Quarters Management Information System (ADMSR)

H/W: Hardware

IBM: International Business Machines

IBM/MVS: Specific Proprietary Environment

ICARUS: Index of Conservation and Analytical Records; Unified System

ICCROM: International Centre for the Study of the Preservation and the Restoration of Cultural Property

ICOM: International Council of Museums

ICOMOS: International Council on Monuments and Sites

IDEAL: Data Base used by GTA

IDS II: Integrated Data Store - Bull Data Base Management System

IM: Information Management

IMAA: Increased Ministerial Authority and Accountability

IMP: Information Management Plan

IOS: Integrated Office System

IRAC: Informatics Review and Advisory Committee

IRM: Information Resource Management

ISDN: Integrated Services Digital Network

ISIR: Integrated Service for Information Resources

ISN: Inter-departmental Settlement Notices

ISO: International Standards Organization

ISSC: Information Systems Steering Committee

IT: Information Technology

ITU: International Telecommunication Union

IX: Inter City

JTN: Journal Tower North

JTS: Journal Tower South

LAN: Local Area Network

LSS: Local Shared Services inventory for each regional GTA office

MAC: Macintosh Personal Computer manufactured by Apple Computers

MCP: Movable Cultural Property

MICOM: Word Processing equipment manufacturer

MINO: Minister's Office

MIPS: Millions of Instructions Per Second

MMIS: Materiel Management Information Sysytem

MOU: Memorandum of understanding

MSA: Management Science America, a software supplier for business accounting software packages

MSAT: Mobile Satellite

MS-DOS: MicroSoft Disk Operating System

APPENDIX C. GLOSSARY

MVS: IBM's computer operating system

MYOP: Multiple-Year Operational Plan

NCR: National Capital Region

NCR-FIS: National Capital Region Financial Information System

NMCS: National Materiel Control System

NTIA: National Telecommunications and Information Administration

OCR: Optical Character Recognition

OECD: Organization for Economic Cooperation and Development

OLDE: On-line Data Entry

O&M: Operation and Maintenance

OLIS: Official Languages Information System

OSI: Open Systems Interconnect

PABX: Private Automatic Branch Exchange

PACBASE: An Integrated Computer Aided Systems (Software) Engineering tool

PACDESIGN: An Integrated Computer Aided Systems (Software) Engineering tool

PARIS: Pictorial and Artifact Retrieval Information System

PARS: Former Personnel Application Service from DSS

PASS: Procurement and Acquisition Support System

PC: Personal Computer

PMAR: Personnel Monthly Activity Report

PMIS: Personnel Management Information System

POT: Preferred Office Technology

PY: Person-year

RDBMS: Relational Data Base Management System

R&D: Research and Development

RJE: Remote Job Entry

ROMIS: Regional Operations Management Information System

SADM: Senior Assistant Deputy Minister

SDLC: Synchronous Data Link Control, an IBM communications message protocol

SIRI: (ISIR) Integrated Service for Information Resources System

SL-1: Switching Equipment by Northern Telecom

SMAQ: Assistant Deputy Minister, Quebec

SMC: Senior Management Committee

SMDR: Station Message Detail Recording

SMIS: Sector Management Information System (ADMSR)

SMS: Spectrum Management System

SQL: Structured Query Language and the Government-wide standard as a universal database access method

SSC: Supply and Services Canada

STM: International Semi=Tech Microelectronics - Facilities Management Contractor

S/W: Software

APPENDIX C. GLOSSARY

SYSEXAM: Examination System (SMS)

SYSTEM 2000: Data Base Management System used by ADMSR at STM

TAPS: Transaction based Acquisition and Procurement System

T.B.: Treasury Board

TCMS: Telecommunications Circuit Management System

TIMS: Transaction based Inventory System (Consumables)

TP8: Transactions Processing Software

TSO: Time sharing option

UNIFY: Type of data base

UNISYS: Computer manufacturerer

UNIX: Operating System

VAX/VMS: Specific Proprietary Environment for DEC equipment

VIP: Communications Protocol used by Bull equipment

WAN: Wide Area Network

WATS: Wide-Area Telecommunications System

WS: Workstation (Personal Computer)

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