

COMPUTERIZED LIBRARY AND INFORMATION NETWORKING IN CANADA

RESEAUX INFORMATIQUES DE BIBLIOTHEQUES ET D'INFORMATION AU CANADA

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ABSTRACT

This article is a selective summary of a forthcoming report. It identifies and provides brief notes on 3 Canadian and 5 US "Library Processing Facilities", 7 Canadian "Library Network User Groups", 2 Canadian and 3 US "Information Retrieval Facilities". The findings are given of a national location service planning exercise; of a brief survey concerning priorities for work on network standards; and of survey work concerning management and funding of library networking in Canada. Lastly, relevant views submitted to the National Library of Canada by the Canadian library community are noted.

RESUME

Cet article est un sommaire selectif d'un rapport sur le point de paraître. Il identifie et fournit des notes brèves sur 3 "Facilités de traitement de bibliothèques" canadiennes et 5 des Etats-Unis, 7 "Groupes d'utilisateurs dans les réseaux de bibliothèques" canadiens, 2 "Facilités de recherche de l'information" canadiennes et 3 des Etats-Unis. Les découvertes sont données d'un exercice de planification d'un service national de localisation; d'une enquête sommaire concernant les priorités pour le travail aux normes de réseaux; et de travail concernant la direction et le financement de réseaux de bibliothèques au Canada. Pour finir, les idées pertinentes qui ont été soumises à la Bibliothèque nationale du Canada par la communauté de bibliothèque canadienne sont notées.

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1. INTRODUCTION

This article provides a selective summary of the first volume of a report to be published by the National Library of Canada: the main report of the Canadian Computerized Bibliographic Centre Study. The study was initiated in 1976 by the National Library of Canada in response to the recommendations of a national seminar attended by delegates of 19 organizations concerned with library and information network development in Canada. All regions of Canada were represented at the seminar. There were also representatives of most types of library, of the most concerned federal and provincial government agencies, and of the principal professional associations. The purpose of the study was to provide an overview of the situation concerning computerized bibliographic centres in Canada and to report on the most effective means of promoting computerized library network development in the country with particular reference to computerized national location service development. Volume 1 of the main report of the study provides the overview; this is the volume selectively summarized in this article. The second volume will present proposals for action.

2. COMPUTERIZED BIBLIOGRAPHIC CENTRES

Three types of computerized bibliographic centre are identified: "Library Processing Facilities" (LPFs); "Library Network User Groups" (LNUGs); "Information Retrieval Facilities" (IRFs). Definitions of these terms are given below. The study team used Library of Congress networking terminology as far as possible, and only introduced new terms where the LC terminology proved inadequate in the Canadian context.

2.1 Library Processing Facilities

Table 1 shows the "Library Processing Facilities" covered in the study. A LPF is a centre that operates one or more computers to support one or more library technical processing operations for libraries of more than one

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TABLE 1: LIBRARY PROCESSING FACILITIES: AVAILABLE USER, TERMINAL AND BUDGET DATA, 1977

Name of LPF	User Institutions ¹	Terminals in LPF service	Budget data 1977/78	
			Person-years	Expenditure \$ million
<u>dedicated</u>				
Canada: UTLAS	210	100	70	1.8
US : BALLOTS	105	175	30	1.6
OCLC	1229	1670	317	15.0
WLN	173	74	13	1.3
 <u>non-dedicated</u>				
Canada: BNQ	1	0)	Comparable	
NLC	13	0)	data	
US: BNA	400 ²	0 ³)	not	
LC	66	4)	available ⁴	

Notes:

1. Institutions irrespective of whether they belonged to a Library Network User Group or not. Numbers were supplied by the LPFs and may not be based on a uniform method of counting.
2. Included 4 Research Library Group (RLG) libraries.
3. RLG computer-to-computer communications link configured to appear to the LC computer as 4 user terminals.
4. It is very difficult to separate expenditures on LPF services from other expenditures for the non-dedicated LPFs.

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institution. The scope of the term is nearly equivalent to "Bibliographic utility" in Library of Congress networking terminology. The Canadian LPFs are: University of Toronto Library Automation Systems (UTLAS), National Library of Canada (NLC), and Bibliothèque nationale du Québec (BNQ). The US LPFs are OCLC Inc., Washington Library Network (WLN), Stanford University's BALLOTS, the Library of Congress (LC), and Blackwell North America (BNA) Inc.

UTLAS is by far the largest Canadian LPF; published figures record that by September 1978 it provided on-line catalogue support service to over 65 major institutions in Canada which in turn represented over 100 different library systems with over 500 individual libraries in five provinces from Quebec to British Columbia. Early in 1979 UTLAS signed up a customer library in Newfoundland, giving it a coast-to-coast customer base. UTLAS ranks as North America's second largest LPF, after OCLC Inc., by most statistical counts. It has been estimated (early 1979) that UTLAS operates some \$6 million worth of computer hardware and manipulates customer data bases representing a capital investment of some \$30-\$40 million. UTLAS/University of Toronto are also pioneers in various applications of technology, including the development of local library mini-computer systems to interface with the UTLAS mainframe system, means of holding customer library data bases on the mainframe system, and extensive use of microform catalogues.

NLC and BNQ offer only very limited LPF services at the present time; their main activities in this respect are the production and distribution of Canadian MARC and Fichier MARC québécois records. NLC is scheduled to commence operation in late 1979 of an on-line shared cataloguing system. This system will employ an enhanced, Canadian version of the Dortmunder Bibliothekssystem (DOBIS) software and will serve NLC and other Canadian federal government libraries which wish to use the system.

2.2 Library Network User Groups

Table 2 shows the seven Canadian "Library Network User Groups" documented by the study. A LNUG is a formally constituted group of libraries using the services

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**TABLE 2: CANADIAN LIBRARY NETWORK USER GROUPS:
AVAILABLE MEMBERSHIP, TERMINAL AND
BUDGET DATA, LATE 1977**

LNUG	Predominant type of library	Total membership ¹	Number of terminals used	Staff person-years ⁴	Budget \$1000
AAU/BNA	Academic	17	None ³	7	93
BCUC	Academic	7	4	3	306
CCBN	Academic	21 (105)	10	74 ⁵	1200
MTLB	Public	11 (252) ²	5	8	176
NRLS	Public	4 (45)	2	41 ⁵	625
OULCS	Academic	32 ²	43	11	1500
TRC/NCRLS	Public	11 (140)	2	8	83
Totals		103 (598)	66	152	3983

Notes:

1. Where LNUGs include multi-library organizations as members, the numbers within brackets indicate the total number of individual libraries. Numbers were supplied by the LNUGs and may not be based on a uniform method of counting.
2. MTLB operated two different projects with different memberships; the largest project included a total of 252 individual libraries. OULCS operated a total of 7 different projects with membership varying from project to project. One of the largest and most important of these projects is the UNICAT/TELECAT shared cataloguing project which is administered in cooperation with the Conference of Rectors and Principals of Quebec Universities.
3. Batch system.
4. These statistics were provided by the LNUGs, and are not comparable. They generally include staff in individual libraries working on LNUG work as well as central LNUG full-time staff.
5. These two LNUGs also provide central acquisition and book processing services to their members; hence the comparatively large number of person-years.

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of one or more Library Processing Facilities for one or more common purposes. In Library of Congress networking terminology a LNUG would be called a "Bibliographic Service Center". The groups are: Association of Atlantic Universities/Blackwell North America Project (AAU/BNAP); British Columbia Union Catalogue Project (BCUC); Centennial College Bibliocentre Division (CCBD); Metropolitan Toronto Library Board (MTLB); Niagara Regional Library System (NRLS); Ontario Universities' Library Cooperative System (OULCS) and Tri-Regional Catalogue/North Central Regional Library System (TRC/NCRLS).

Problems of data compatibility make it difficult to relate Table 1 and Table 2 figures to each other and to published library statistics. It seems, however, that by late 1977 the majority of Canadian university libraries participated in some way in a Library Network User Group; the proportion may have been as high as three-quarters. The proportions of Canadian college libraries and of public and regional libraries were very much lower while remaining categories of library (such as company, school and governmental) was zero or extremely small. All regions of Canada had some form of LNUG, except the Prairie Provinces and the Northern Territories.

2.3 Information Retrieval Facilities

Canada has two Information Retrieval Facilities (IRFs). An IRF is a centre operating one or more computers to provide citation or information retrieval services to more than one organization from a number of data bases. The largest of these is the Canada Institute for Scientific and Technical Information (CISTI). In July 1977 CISTI provided on-line IR services to 271 remote terminals in 111 regional centres across Canada. Its batch processing SDI services reached (mid-1977) 1400 individual and group subscribers serving some 4300 users in various fields of science, engineering and medicine. In addition, and in cooperation with CISTI, the National Library of Canada also offers current awareness and on-line retrieval services mainly in the social sciences and humanities. These services are provided using CISTI hardware and

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software. QL Systems Ltd is Canada's second IRF. In mid-1977 it offered on-line access to some 33 data bases, 29 of which were Canadian. In mid-1977 QL had over 200 users, approximately half of them libraries. In the course of the study information was gathered concerning the Université du Québec's BADADUQ system. This did not qualify under the study's definition of an IRF since it served the libraries of only one institution. The study also documents three US IRFs: Lockheed Information Systems, SDC Search Services and Bibliographic Retrieval Services Inc. In terms of data base sizes in 1977, CISTI (4.8 million on-line citations) ranked ahead of BRS (3.5 million) but a long way behind LIS (19 million) and SDC (12.2 million).

3. COMPUTERIZED NATIONAL LOCATION SERVICE PLANNING

There are many options between complete centralization and complete decentralization within the national location service system. Assessment of options is handicapped by a serious lack of statistics, particularly concerning interlibrary loan related data traffic in the country. Assessment of options is also handicapped by the severe limitations of modelling as means of determining at any given point in time how much decentralization is feasible of data bases that typically support a range of library processes (e.g. cataloguing, interlending, acquisitions, information retrieval).

Models considered point towards the initial superiority of one (Model 1) in which a national centre maintains as comprehensive a national location data base as circumstances permit, over another (Model 2) in which the national centre maintains a much more limited data base. In Model 2 the national centre is assumed to hold locations only for those libraries whose holdings are not available through a multi-regional centre (e.g. UTLAS). When computer-to-computer communication is more widespread than it is today, the balance of advantages in favour of Model 1 will be less marked. The balance may, at that time, swing in favour of Model 2, subject to a number of other factors. These factors include the need for publi-

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cation of union catalogues and lists and the extent to which individual libraries implement and maintain relatively independent individual automation arrangements.

It is concluded that a realistic approach is to continue to implement a relatively centralized computerized national location facility with as comprehensive a national location data base as circumstances permit, while taking opportunities to experiment with arrangements leading towards a more decentralized pattern. In this way, aspects of the system which it is desirable to decentralize can be decentralized in a series of practical steps each justified on its own merits and each tested experimentally in advance.

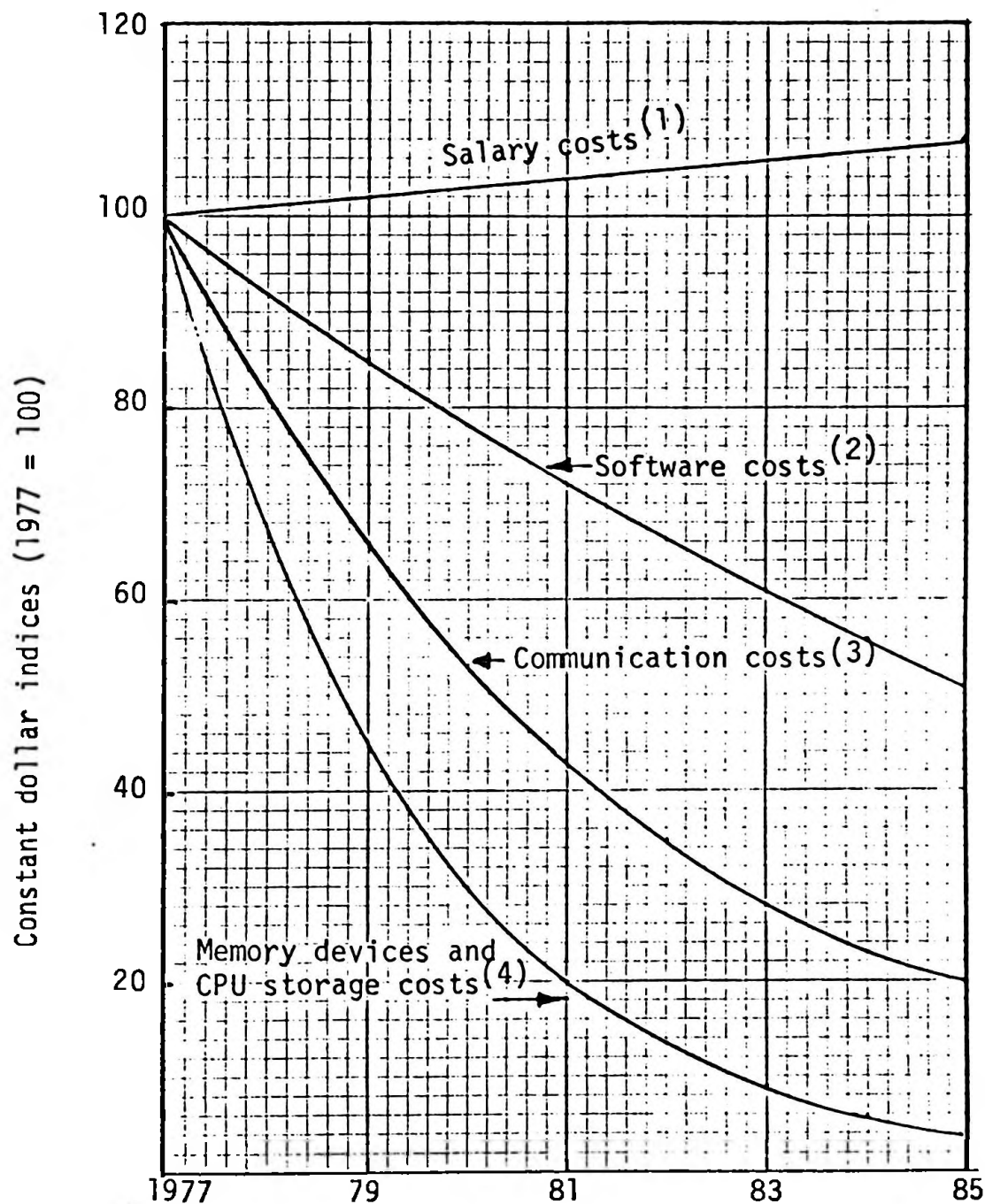
4. TECHNOLOGICAL AND COST TRENDS

Statistics are presented concerning technological and cost trends with an important bearing on library and information service networking in Canada. Cost projections are generally indicated in Figure 1 below. These projections are intended to indicate the general nature of cost trends to 1985 rather than to be taken as precise predictions. Whatever the precise figures, CPU and memory costs are falling rapidly; communications costs are falling, but not so rapidly; and personnel costs are tending to rise, even in real terms. The smooth hardware and communications curves in the figure will in practice not be smooth; they will probably descend in sloping steps. While personnel costs are rising slowly in real terms, software costs per executable machine instruction are projected to fall in real terms. The latter projection is compatible with a rise in software costs as a percentage of total system costs since hardware costs are falling much more rapidly, and more sophisticated systems require more software.

Apart from these general cost trends, there is a strong movement towards universal, intelligent and shared data networks; there is a dramatic growth in the variety and number of accessible data bases and a dramatic fall in the costs of on-line searching. In combination, these

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FIGURE 1: PROJECTIONS FOR HARDWARE, SOFTWARE, COMMUNICATIONS AND PERSONNEL COSTS, 1977-1985



1. Cost per year per person (analysts, programmers and operators)
2. Cost per executable machine instruction
3. Cost per character transmitted
4. Cost per byte stored

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developments will have a profound impact on the future pattern of networking in all countries including Canada.

A review of the effect of technological, cost and administrative factors on the centralization/decentralization balance in network design confirms the conclusions drawn earlier on the basis of national location service modelling. In the context of general NLC data base planning, a centralized and necessarily somewhat limited NLC bibliographic data base operated on a single installation may be considered as a feasible step towards a more decentralized and comprehensive Canadian national bibliographic data base. Experiments with other centres should be used to determine whether, and what, more decentralized arrangements are currently viable. These arrangements should then be implemented.

5. STANDARDS

In view of the importance of standards in computerized library and information networks, the study included a brief survey oriented towards establishing priorities for action by the National Library of Canada concerning computerized library and information networking standards. The principal findings of this survey are that: NLC should concentrate its networking standards efforts on standards and protocols needed for computer-to-computer links; that present NLC involvement in bibliographic standards activities be continued; that consideration be given to the need for a user-oriented focal point which could represent user views and influence the vendors of on-line search services to standardize where feasible and practical; that NLC provide, as far as resources permit, a library automation consulting service to Canadian libraries and that NLC should use this service to help promote the use of appropriate standards.

6. MANAGEMENT AND FUNDING OF LIBRARY NETWORKING IN CANADA

The most important conclusions emerging from work in this area are that the National Library of Canada is the federal government agency with the broadest and most

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comprehensive mandate to initiate and support national and federal schemes for information and library network development in the country; NLC has, in effect, the mandate to propose a nationwide library and information network analogous to the nationwide network of museums and exhibition centres which receives federal assistance and support under the National Museums Policy; that the existing mechanisms for funding network related R & D (through sponsorship by federal agencies and facilitated by bridge funds under the federal government's Unsolicited Proposals Funding scheme) must be considered adequate until proven otherwise by careful monitoring over a period of time; that while a number of consultation arrangements exist within limited jurisdictions (i.e. single agency, single province), new arrangements will be required as broad-based federal and nationwide library and information network programs are developed; but that new consultation arrangements should be created only at the time of implementing the network programs that they are designed to support. The first priority is to agree on the networking programs to be mounted. Following this agreement, appropriate consultation arrangements should be implemented in conjunction with these programs.

7. VIEWS SUBMITTED BY THE CANADIAN LIBRARY COMMUNITY

NLC received a sizeable number of written briefs in connection with the 1976-78 review of its objectives, services and organization and in connection with the Canadian Computerized Bibliographic Centre Study. The principal recommendations which both appear in the majority of briefs and relate to NLC's role in computerized library network development in Canada are essentially that NLC: work towards the establishment of a nationwide bibliographic network consisting of a national computerized bibliographic centre and a number of regional or provincial bibliographic centres (supported by 8 submissions); provide leadership in planning and coordinating bibliographic services and resources in Canada (7 submissions); and maintain and develop the Canadian national union catalogue on-line (6 submissions).