OPEN SYSTEMS AND DOBIS

SYSTEMES OUVERTS ET DOBIS

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ABSTRACT

The current operational status of the Canadian government installation of DOBIS - in supporting national services provided by the National Library of Canada and the Canada Institute for Scientific and Technical Information, and in supporting federal library housekeeping - is described. Then, policies and developments that will broaden access to information are overviewed. These developments include "search only" accounts on the DOBIS system, and standardization activities in the area of interconnection of bibliographic systems according to the Open Systems Interconnection model. The interconnection activities have been initiated as preliminary steps in the development of a decentralized Canadian bibliographic network.

RESUME

L'auteur décrit l'état d'opération actuel de l'installation DOBIS du gouvernement canadien: son rôle dans le soutien des services nationaux offerts par la Bibliothèque nationale du Canada et de l'Institut canadien de l'information scientifique et technique, et dans le soutien de l'administration des bibliothèques fédérales. Il aborde ensuite, de façon générale, les politiques et les développements qui élargiront l'accès à l'information. Ces développements comprennent des abonnements "d'interrogation seulement" du système DOBIS, et des activités d'uniformisation dans le domaine de l'interconnection des systèmes bibliographiques selon le modèle d'Interconnection des systèmes ouverts.

OPEN SYSTEMS AND DOBIS

INTRODUCTION

Background

The Canadian government installation of DOBIS is alive and well and being operated by the National Library of Canada out of the National Research Council Computation Centre. The data base contains over 1.8 million records, both loaded off-line (eg. Library of Congress MARC, CAN/MARC and CONSER), and created on-line by user libraries. In 1980/81, the system was up and available for 96% of the scheduled up-time. Of the unscheduled down-time, two-thirds was due to hardware problems beyond the control of the National Library.

This installation of DOBIS is being used by seven federal government libraries - the National Library, the Canadian Institute for Scientific and Technical Information, the Library of Parliament, the Public Service Commission, Finance/Treasury Board, Atomic Energy Control Board, and Transport Canada - in support of various searching, cataloguing, and union catalogue applications. These applications include ILL verification and location, reference searching, pre-order searching, cataloguing (with associated output products like COM catalogues, cards, accessions lists), and union catalogue and holdings maintenance. Over 160 dedicated user terminals are installed in the National Capital area with over half of these installations in the National Library. Remote searching trials via Datapac have been conducted from libraries in Quebec and British Columbia. Expansion of the use of the system within current user libraries, and to other federal user organizations, is continuing.

Role

The objective of the Canadian government installation of DOBIS is to provide systems support in a manner that satisfies user requirements. The first line users are federal organizations, and the priority of their requirements may be stated broadly as:

i. First and foremost, improve the national information services provided to the people of Canada, and, as a corollary,
ii. Improve the housekeeping operations of federal information provider organizations that are using DOBIS.

Examples of national information services provided by the National Library include an ILL location service, maintenance of the Canadian union catalogue, and publication of the Union List of Serials in the Social Sciences and Humanities. DOBIS supports such services directly through on-line terminals installed in the

National Library. But, it is also possible that provision of and access to such national services could be improved through on-line access to DOBIS directly by non-federal organizations. For example, ILL locations could be contributed or retrieved on-line.

An example of a typical housekeeping operation supported by DOBIS is cataloguing. Note that the second priority stated above supports the first, that is, if the federal organization can improve its cataloguing and indexing operations by employing DOBIS support, then, information can be more easily accessed to support national services.

Types of services offered to the two categories of DOBIS users - federal and non-federal libraries - are illustrated in Figure 1. Note that non-federal user libraries that are not contributing to national services (eg. maintenance of the Canadian union catalogue or production of Cataloguing in Publication data) will have so called "search only" accounts. "Search only" users can't change or add to information in the data base and won't receive any housekeeping support services or products.

On one hand, as implied in the preceeding paragraphs, access to DOBIS could be expanded through expansion of the number of terminals that directly access DOBIS, both in federal libraries (for provision of national services and housekeeping), and in non-federal libraries (for provision/receipt of national services). In fact, this expansion of access is planned to occur on a controlled basis. However, such expansion is merely building on a "closed" system - a network of terminals and computers all using the same system. This strategy does not lead to a decentralized Canadian bibliographic network.

OPEN SYSTEMS

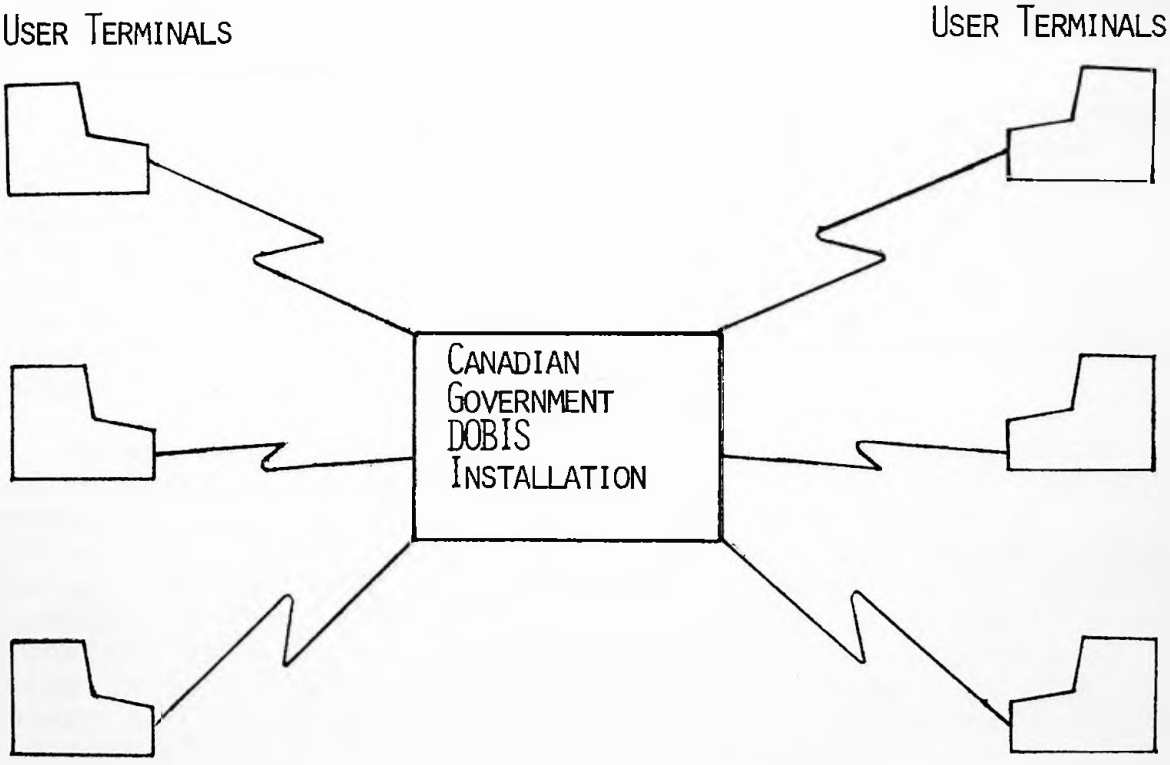
On the other hand, access to <u>information</u> (not just to DOBIS) could be facilitated by development of an "open" system of independent, interconnected, automated information networks and systems i.e. a decentralized Canadian bibliographic network. Promulgation of the development of a decentralized Canadian bibliographic network is the number one priority of the National Library (National Library of Canada, 1979). The proposed context for interconnection of bibliographic systems has been described by Buchinski and Islam (1980).

Figure 2 illustrates the conceptual difference between closed systems and open systems. The users of the closed system X have access to the data base, services and facilities only of system X. The users of each of the systems A, B, C, and D are interconnected through standard interface protocols to the data bases, services and facilities of the others.

OSI reference model

If the standard interface conforms to the Open Systems Interconnection (OSI) reference model being prepared by the International Organisation for Standardization (ISO, 1979) and the Comite consultatif international telegraphique et telephonique (CCITT), then the totality of the interconnected communications facilities, hardware, and software is called an open system.

FIGURE 1. CATEGORIES OF DOBIS USERS.



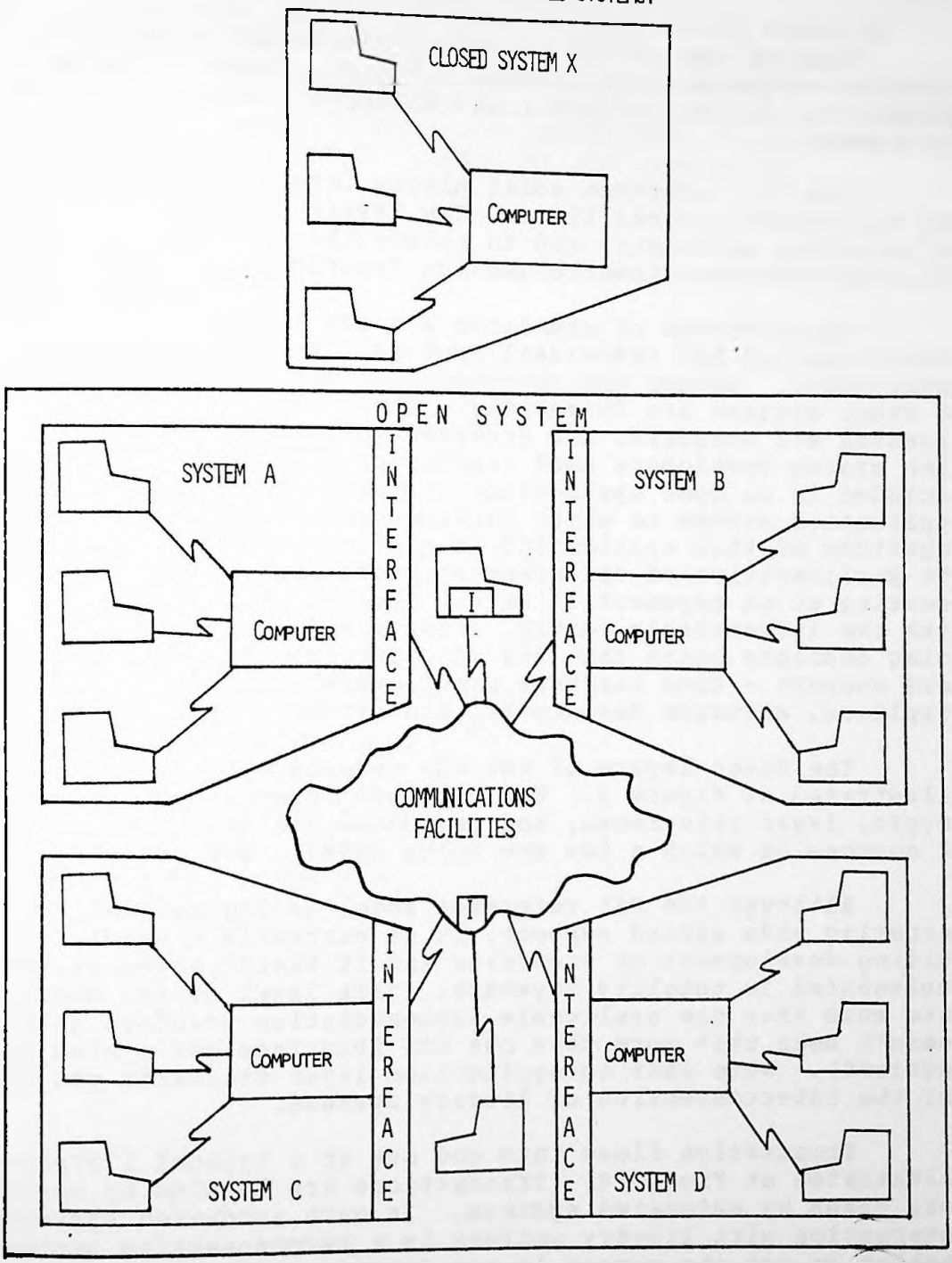
NON-FEDERAL LIBRARIES

- CONTRIBUTING TO NATIONAL SERVICES
- RECEIVING NATIONAL SERVICES (I.E. SEARCH ONLY)

FEDERAL LIBRARIES

- CONTRIBUTING TO NATIONAL SERVICES
- HOUSEKEEPING
- RECEIVING NATIONAL SERVICES

FIGURE 2. OPEN AND CLOSED SYSTEMS.



The purpose of OSI is to facilitate the meaningful exchange of information between different types of hardware (computers, terminals, etc.) and different software (computer programs).

The OSI reference model places layers of functions around the telecommunications links. The layered approach is employed to introduce modularity and to reduce the complexity of the telecommunications interconnection functions.

Restrictions or standards are not imposed on the internal functioning of the individual systems interconnected in an open environment. Rather the protocols and functions of the interface to other systems are formalized. Thus, once the OSI model is approved and standards are accepted for each of the OSI layers, then system developers need develop only one interface to be included in an open application instead of one for each application system to which interconnection is desired. The magnitude of this application is difficult to appreciate because the proliferation of different machines and applications is occuring at an exponential rate. This proliferation together with the increasingly costly, intertwined, complex nature of doing business means that the OSI approach is gaining more and more support - from hardware manufacturers, telecommunication suppliers, software developers, and system users.

The seven layers of the OSI reference model are illustrated at Figure 3. The proposed functions of the different layers, layer interfaces, and protocols are described in a number of sources of which a few are Folts (1981), Gee (1980).

Although the OSI reference model is logical and is garnering wide spread support, it is currently a model for guiding development of standards and it hasn't actually been implemented in totality anywhere. Each level of the model will have more than one applicable implementation standard (this doesn't mean that more than one OSI interface per system is required). Note that no application layer standards yet exist for the interconnection of library systems.

Transaction flows into and out of a typical library are illustrated at Figure 4. Transactions are handled by systems, in some cases by automated systems. In such automated systems, the interaction with library patrons is a person-machine protocol, whether or not the person is the library patron or the librarian, while the interaction with library material/service suppliers and with other libraries could be machine to machine. Although standardization activities are occuring both for the person to machine dialogue interaction and for machine to machine interconnection, it is the latter that are generally considered as the candidates for OSI. Application level OsI protocols for

inter-library loan (ILL), machine readable record exchange (searches and cataloguing copy in Figure 4), and location searching are all high priority candidates. As another example, one of the flows from libraries to suppliers of library materials and services - money - will in all probability be supported by electronic banking systems within the OSI framework.

FIGURE 3. OSI REFERENCE MODEL.

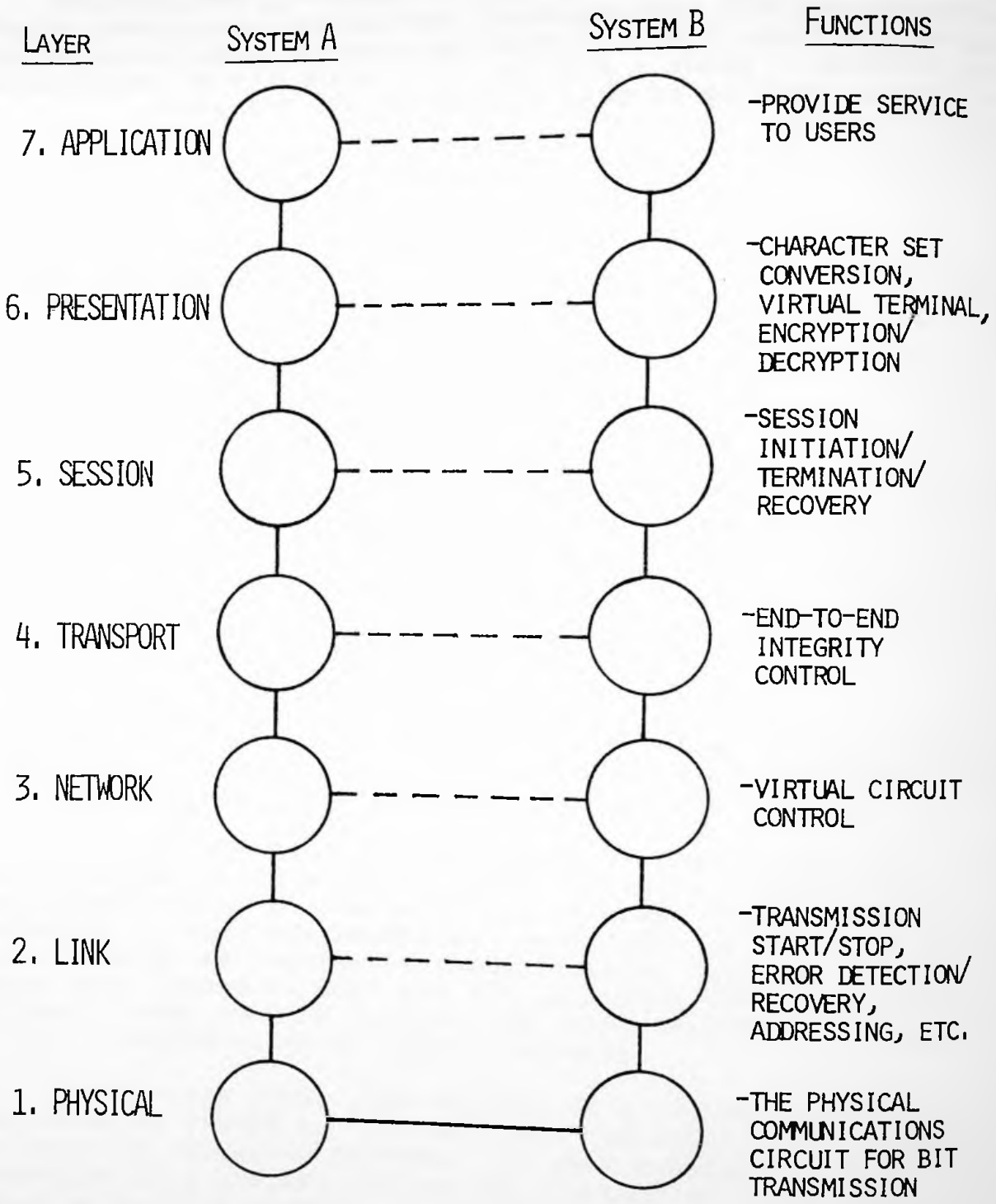
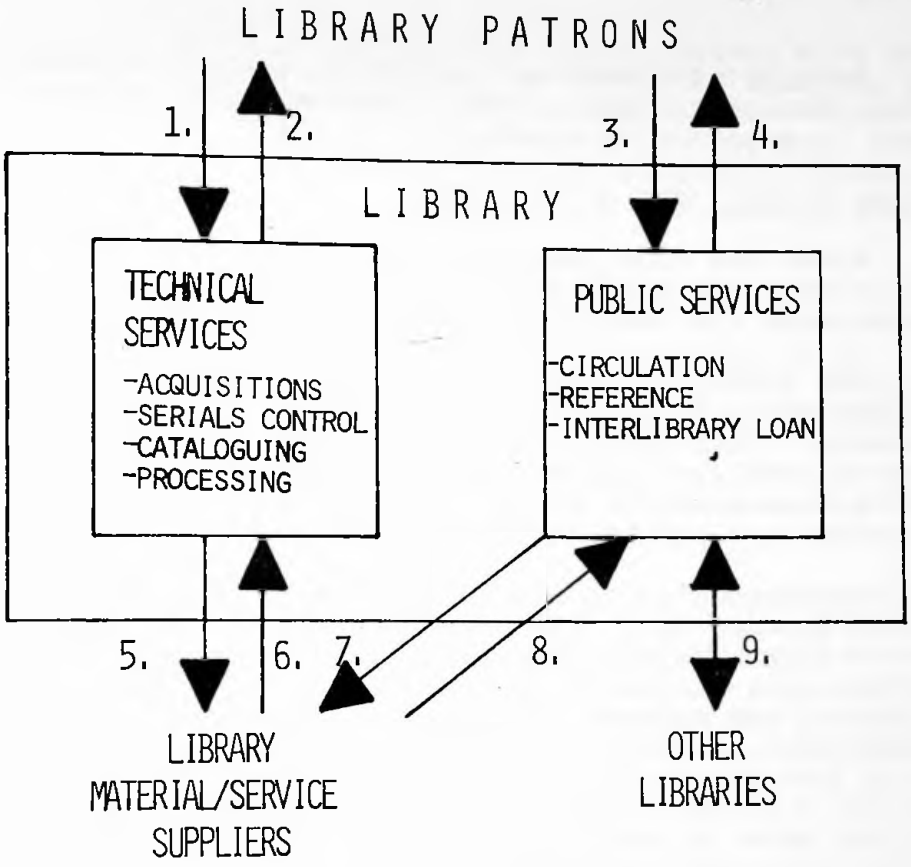


FIGURE 4. TRANSACTION FLOWS INTO AND OUT OF A TYPICAL LIBRARY.



1. REQUESTS FOR ORDERS, CATALOGUE SEARCHES, SERIAL ROUTING REQUESTS, ETC.
2. FULFILLED ORDERS, LOCATIONS, ROUTING SERVICE, ETC.
3. INFORMATION REQUESTS, BORROWING REQUESTS, ILL REQUESTS, ETC.
4. INFORMATION, HOLDS, LOANS, ETC.
5. DOLLARS, PURCHASE ORDERS, CLAIMS, CATALOGUING COPY SEARCHES, ETC.
6. MATERIAL, INVOICES, CATALOGUING COPY, LABELS, ETC.
7. CITATION SEARCHES, LOCATION REQUESTS, DOLLARS, ETC.
8. CITATIONS, LOCATIONS, INVOICES, ETC.
9. LOANS, ILL REQUESTS, CLAIMS, ETC.

Open interconnection of systems to support functions like ILL and cataloguing is how the decentralized Canadian library network is expected to operate.

NATIONAL LIBRARY OSI INITIATIVES

Given the high priority of OSI for bibliographic applications, the National Library and other Canadian organizations are commiting scarce resources to its development.

The National Library is participating actively in national and international OSI standards development in the CSA, ANSI, and ISO arenas. This participation includes work on the OSI reference model, on character sets, on bibliographic machine-readable communication formats, and on the protocols for the application and presentation layers of the OSI reference model.

The National Library Advisory Board has recently appointed two committees. In an NLC news release of 26 March 1981, it was announced that the Bibliographic and Communications Network Committee will address policy issues in the creation, development, management and financing of a bibliographic communication network in the new electronic age, with first priority the creation of a decentralized nationwide network. The companion Resource Network Committee will examine the most cost-effective means of ensuring the broadest possible sharing of Canadian libraries' services and collections. This committee will submit policy recommendations regarding research collections; interlibrary loans, document delivery, legal deposit and conservation. The questions being investigated by both committees are interrelated and complementary, so close liaison will be maintained between them.

The National Librarian, in a news release dated 10 December 1980, announced the formation of the Task Group on Computer/Communications Protocols for Bibliographic Data Interchange. This group is charged with the development of standardized protocols that will enable emerging and existing library systems, utilizing different computer equipment and different software, to interchange bibliographic data. This work is to be done within the framework of the OSI reference model. It is likely that the work of this group, which will concentrate especially on the application layer of the OSI model for bibliographic purposes, will be recognized by the Canadian Standards Association. The group has met twice, and has made progress in mapping the environment in which the interconnection is to take place. Priority guidelines for the Task Group will be established by the Bibliographic and Communciations Network Committee of the National Library Advisory Board.

The Task Group is maintaining close liaison with the American National Standards Committee Z39: the chairman of ANSI Z39 is an observer on the Task Group. ANSI Z39 is concentrating on development of OSI protocols to be utilized by WLN, RLG, and LC in the so called LASP project (Linked Authority Systems Project).

CONCLUSION

Even with wide spread support for the OSI model, and with the tremendous amount of OSI standards work going on in committees all over the world, cynics will probably still say that a decentralized Canadian library network with attendant benefits is far off in the distant cloudy future. It may be sooner than the cynics believe because Canadian trials to test some of the OSI concepts with bibliographic systems are being arranged now, and could start in early 1982.

OSI is a concept whose time has come, a concept that is integral to realization of benefits predicted for the "global village" of the electronic age. Library systems must interconnect with each other and with the rest of the world, or else libraries will eventually be circumvented and will enter a period of stagnation while information seekers go elsewhere to fill their needs.

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