INTERNATIONAL COOPERATION IN LIBRARY AUTOMATION†

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INTRODUCTION

Cooperation has been a long-standing tradition in the library field. Libraries and librarians have established formal and informal agreements for many purposes, such as the creation of cooperative acquisition or preservation programs, the establishment of union catalogs or union lists of materials which, in turn, have been the foundation of interlibrary loan systems, the creation of cooperative reference service programs, or the establishment of reciprocal borrowing programs. The main reason for entering into such agreements is to obtain the most value for limited amounts of money while at the same time, improving or expanding the service provided.

The introduction of automated techniques, although adding other complexities to the process, has not changed this basic premise. Standards had been important in nonautomated cooperative programs, but with automation, they have become essential. At the international level, standards are the underpinning ingredient for cooperative programs like the Universal Bibliographic Control (UBC) project.[1]

It should be noted, however, that international cooperation in library automation has emphasized cooperation in the development of standards that would facilitate automation projects rather than the active development of automated projects. Such a limitation is only realistic since the development of standards at the international level is a formidable task in itself. The following section of this paper describes the areas in which standards have

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been implemented or in which they are being developed.

INTERNATIONAL STANDARDS ACTIVITIES

Although the emphasis in this section is placed on standards dealing with library automation, two international cataloging "standards" are also mentioned because of their wide-ranging effect on automation at national and international levels. The standards in question are the series of International Standard Bibliographic Descriptions (ISBD) and the second edition of the *Anglo-American Cataloguing Code (AACR2).* The ISBD in particular is significant because it provides specifications for elements that can be used to identify an item regardless of its type (monograph, serial, film, music score, sound recording, map, or machine-readable data file) or of the cataloging rules used to describe the item. (The latter point is described in greater detail below in the discussion on the Common Communications Format.) *AACR2* and its predecessor have also played a significant role in the development of machine-readable cataloging (MARC) formats at the national level in the United States and other countries such as Canada, the United Kingdom, and Australia. The development of the MARC formats is described in greater detail in other sources.[2]

Work on the MARC formats at the Library of Congress led to the creation of official standards affecting bibliographic control in the United States and other countries and eventually by the International Organization for Standardization (ISO). It is important to note that although the Library of Congress developed the MARC formats to carry cataloging information for use primarily by the library community, the evolution of the MARC formats to a standard adopted by the American National Standards Institute (ANSI) and ISO required that the format be generalized so that all types of bibliographic or information agencies, including libraries, could use it as a vehicle for interchange.

Hence, the standards (ANSI Z39.2 and ISO 2709) contain the specifications for a format structure only.[3] The applicability of this approach can be seen by the fact that libraries and library-oriented agencies in many parts of the world are using these standards as well as agencies like the U.S. National Technical Information Service or the International Nuclear Information System that

concentrate on items such as technical reports or journal articles.

In the early 1970s following the adoption of the ISBD concept and the development of MARC formats by individual national bibliographic agencies, work was begun on a "universal" MARC format under the auspices of the International Federation of Library Associations and Institutions (IFLA) to facilitate the exchange of bibliographic data among national bibliographic agencies and, therefore, promote the concept of Universal Bibliographic Control. The environment which prompted this action can be described as follows:

(1) Although many bibliographic agencies had adopted the ISBD and the format structure specified in ISO 2709, the contents of their MARC records and the techniques used to identify the elements in the records (which is known as content designation) were determined by diverse factors, such as the cataloging code or thesaurus systems followed, the requirements of individual languages or language groups, or the requirements placed on individual bibliographic agencies for specific products.

(2) For interchange among national bibliographic agencies, the above situation necessitated conversion programs that could handle the idiosyncracies in the MARC records from each national agency.

The result of the IFLA work is a document that has become known as the UNIMARC format.[4] The UNIMARC format is based on the premise that the elements in the ISBD needed to identify an item uniquely would be included and content designated uniformly, but the content designation of other elements in the machine-readable record would have to accommodate the diverse factors mentioned above, such as different cataloging codes, thesaurus systems, and so forth. For example, the U.S. MARC formats, because they are based on *AACR*, specify the content designation for names, first by function (main or added entry), and then by type of name (personal, corporate, or conference). On the other hand, the UNIMARC content designation emphasizes type of name and secondarily, function. It is expected that upon receipt of records in a UNIMARC format, individual bibliographic agencies will convert the records to their own national MARC

format and subsequently manipulate both the content designation and the contents of the records to conform to their own rules.

Two other points concerning the adoption of UNIMARC as a "standard" should be mentioned. First, the contents of the UNIMARC record, other than those elements required by the ISBD to identify an item uniquely, are included at the discretion of the individual national bibliographic agency. And second, the adoption of UNIMARC as a standard has taken place primarily in the library-oriented agencies. These points are important considerations in the light of later developments in the standardization area.

In 1978, work began on what has become known as the Common Communications Format (CCF) under the auspices of UNESCO, following a conference also sponsored by UNESCO to investigate the feasibility of such an effort.[5] What led to this development were the following factors:

(1) Although the acceptance of the format structure specified in ISO 2709 has been wide-spread among information agencies of all types, implementation of the structure had been as diversified as it had been in the library community. The compilation of the UNIMARC format had resolved this issue within the confines of the library community.

(2) A substantial body of bibliographic data, specifically journal articles, is not generally controlled by libraries but by agencies like abstracting and indexing services.

(3) Although libraries do not generally control the bibliographic data for journal articles, they often control the journals in which the articles appear, in the sense that the journals are part of a library's collection.

Specific areas that are being explored for the CCF include the legend portion of the leader in the format structure, common elements needed to identify an item, and a linking technique. These are described below.

Definition of the elements and the codes used in the legend has not been, strictly speaking, part of the standard format structure. A proposal in the form of a working document has been submitted to ISO for review.[6] Briefly, the proposal defines four parts of the legend as follows:

(1) Type of Entity: Specifies the type of item being described

in the record, e.g., language material, music score, or cartographic material.

(2) Bibliographic Level: Specifies the level of the time being described, e.g., monographic, serial, collection, and analytic.

(3) Type of Physical Presentation: Specifies the physical medium of the item being described, e.g., printed, microform, machine-readable, or sound recording.

(4) Application Identifier: Specifies the kind of application, e.g., bibliographic or authority.

Agreement and adherence to these definitions and codes among all information agencies are expected to facilitate exchange among these agencies, in the sense that specific items can be isolated for special processing. For example, abstracting and indexing services may wish to process certain kinds of printed or microform monographic language materials but not musical sound recordings.

Specification of elements needed to identify an item uniquely is essentially a continuation of the ISBD concept. The elements include the title and other title information, statement of responsibility, edition statement, place of publication, name of publisher, date of publication, numerical and/or date designation for serials, and international standard numbers. It should be noted that the elements specified for the CCF comprise a subset of the ISBD since the latter includes elements of bibliographic description that are useful, but not necessarily essential, for identification purposes. Also, the ISBD, while theoretically independent of cataloging rules or codes, is still tied closely to library applications, and it is unlikely that agreement on all aspects of the ISBD could be obtained from nonlibrary applications.

The need for a standard linking technique had been recognized very early in the development of the MARC formats and the standard format structure, and attempts had been made in different national MARC formats to cope with this problem. Following the revision of ANSI Z39.2 in 1979 (with similar revisions in process for ISO 2709), the stage was set for a definitive solution, which includes expansion of the directory entries to indicate different levels of data. Description of this technique and two specific implementations of the technique is found in papers prepared at

the Library of Congress for proposed inclusion in the U.S. MARC formats.[7]

Although substantial progress has been made on the CCF, much remains to be done. The CCF is the latest in a series of efforts to facilitate cooperation at the international level, and the fact that this project involves at least two different communities (the library community and the abstracting and indexing services), each with its own requirements, requires an approach that stresses the points of agreement. As noted in the earlier discussions of the development of the MARC formats, the standard format structure, and the UNIMARC format, the process of creating a standard requires that it be made flexible and general and at the same time, meet the goals or objectives for creating the standard in the first place.

Other standards activities at the international level that are related to library automation include work on character sets, filing, authorities, and application-level protocols. These are briefly described below.

Considerable progress has been made in the area of character sets in recent years, following the many advances in computer technology that have taken place. It was just a little over ten years ago that the capability to input, store, and output uppercase and lowercase alphabetic characters became commonly available, and it was at this point that the development of what has become known as the library character set took place. The technique used was to expand from an existing standard character set in a seven-bit configuration to an eight-bit configuration. Subsequent development has included "standard" escape sequences to accommodate other character sets. To date, standards for extended Latin and extended Cyrillic characters have been approved and published by ISO; standards for basic Greek and extended Cyrillic for Slavonic languages have been approved and are in press; sets for African, mathematics, and bibliographic control have been or are close to being issued as Draft International Standards (DIS); and Arabic and Hebrew have been issued as working papers. And, of course, you are aware of the work on a Chinese set.

Internationally, a set of bibliographic filing principles has been compiled and is being prepared as a DIS by ISO. The approach

used in compiling this standard is similar to that used in compiling the standard format structure (ISO 2709), namely that the standard consists of generalized bibliographic filing principles that could be incorporated into the bibliographic filing rules of individual libraries, nations, or language groups. Accompanying the standard for bibliographic filing principles is an ISO technical report containing international bibliographic filing rules. These rules are intended primarily for use by international organizations and bibliographies but may also serve as a model in the development of national filing rules.

Within the International Federation of Library Associations and Institutions (IFLA), a working group was formed in 1979 to create an international authority system. Three tasks in progress to achieve this goal include: (1) definition of elements needed in a standard authority record, which in turn would lead to the development of an international standard authority format (a UNIMARC for authorities); (2) identification of functional requirements for an international standard authority number; and (3) development of a preliminary model for an interactive authority data network.[8] A fourth task involves analysis to determine if the proposed international standard bibliographic rules can be applied to the UNIMARC format. This task is obviously not limited to authority records but has implications for all kinds of machine-readable records and, therefore, all machine-readable formats.

Work is also proceeding under the auspices of ISO on standard protocols. A working group is attempting to develop a common command language whereby an interface would be available to allow a user at a terminal to search different bibliographic and citation files without learning the different query languages of each system. In the future, work is expected to begin on a computer-to-computer protocol for bibliographic applications. Because this work has not begun on the international level, the individual library standards organizations in the United States and Canada have instituted their own efforts to develop a standard for computer-to-computer protocols for bibliographic applications and are working closely together to ensure compatibility. The results of these efforts will be submitted to ISO for its consideration.

FUTURE CONCERNS

The standards activities described earlier have set in motion other efforts at the international level to bring closer the day when machine-readable bibliographic data can be exchanged more effectively and efficiently. An International MARC Network Study Steering Committee, which was established by the Conference of Directors of National Libraries, has prepared a model agreement that could be used among national bibliographic agencies for the exchange of machine-readable records.[9] This agreement was compiled after a thorough analysis of the problems involved, which included factors like copy-right or other problems related to ownership of data or records.

In addition, the steering committee is in the process of conducting a study (through their respective national agencies) to determine how records could be converted to the UNIMARC format by inputting fifty records in a manual mode following the UNIMARC content designation. The steering committee has also recommended to its parent body, the Conference of Directors of National Libraries, that it should forward a recommendation to IFLA to establish a MARC international office to perform the maintenance functions associated with the UNIMARC format, assist in training bibliographic agencies in the use of UNIMARC, and coordinate with the UBC office and other groups in areas related to bibliographic control.

The participation of organizations from the East Asian countries will be welcomed. It is anticipated that changes/revisions to the UNIMARC format and other "standards" will be necessary to incorporate the requirements of East Asian languages, and such an effort will be facilitated by the active involvement of the library and computer professionals in these countries.

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