

Organizations Contributing to Development of Library Standards

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ANY DISCUSSION OF standards-setting bodies inevitably brings up the question of definition of a standard. In any discipline there will be an assortment of shared practices that are set up and established by authority, custom or general use with more or less formal endorsement. Information science is no different, and "standards" take a variety of forms. While any shared practice may be called a standard, the key to proper use—or to the prevention of misuse—of a standard lies in the careful inspection of the scope of the standard before attempting to apply it. The scope should define the population for which the shared practice is intended to be a standard and the objectives that it is meant to further.

In this paper a variety of organizations will be described that promulgate standards—from those whose sole purpose is the setting of standards, such as the International Organization for Standardization (ISO), to those that develop standards as aids to their missions to provide specific services, such as the International Federation of Library Associations and Institutions (IFLA). The standards set by these bodies may be intended for nationwide or worldwide use in the information science area or for only limited use by a special segment.

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Standards themselves take a variety of forms. They may be guidelines or models against which services, etc., are to be compared. Library service standards fall into this category. Other standards take the form of rules for activities that should be applied as consistently as possible but which, by their nature, will not necessarily produce the identical results even when followed. Cataloging rules are of this type. A third class of standards are specifications or "technical" standards for which strict observance is necessary if sharing is to take place. Format structure, character sets, and code list standards fall into this class.

Against this background, examination of the major standards-setting bodies that influence library standards reveals that they differ in the process by which the standards are developed, the user group for which the standards are intended, and the types of standards a particular organization undertakes. These points will be emphasized later along with an indication of formal and informal relationships between groups. No attempt has been made to be comprehensive, but leading examples of different types of organizations are discussed.

STANDARDS ORGANIZATIONS

The first two organizations described below are devoted totally to standards development. A part of each is responsible for standards for the library, information science and publishing community. Because of the breadth of this constituency, these standards groups usually work with standards that are useful to multiple communities, not just to libraries, and their draft standards are usually subject to a wider review than are those developed within, for example, IFLA.

American National Standards Institute

The American National Standards Institute (ANSI) is the primary nationwide standards-setting body in the United States. ANSI is a "voluntary" standards organization in that the members participate by choice, and the standards are used by choice—ANSI is not a government organization, and its standards have no legal force. The development of ANSI standards is firmly based on voluntary cooperative efforts by corporations and institutions. The members of ANSI are some 900 profit and not-for-profit companies and approximately 200 other standards-producing organizations (such as the many trade associations and institutes). In fact, ANSI, established in 1918, grew out of an industry-felt need to make standard setting more efficient in the United

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States by avoiding the duplication and conflict of standards that different industry-related organizations were developing at that time.¹

The actual work in developing an American National Standard takes place through the American National Standards Committees (ANSC), which are organized by ANSI, and through other recognized standards groups, such as the Institute of Electrical and Electronics Engineers (IEEE), that follow procedures in standards development that meet ANSI requirements. These are all voluntary groups that are organized to develop standards in specific areas. The names and scopes of ANSI Committees that are of the most interest to libraries are the following.²

ANSC Z39—Library and Information Sciences and Related Publishing Practices. Scope: Standards relevant to information systems, products and services, and to encourage their utilization in library, publishing, document delivery, information dissemination, information handling, data systems, and related activities in media.

ANSC X3—Information Processing Systems. Scope: Standardization in the areas of computers and information processing systems and peripheral equipment, devices, and media related thereto; standardization of functional characteristics of office machines and accessories for such machines, particularly in those areas that influence the operations of such machines.

ANSC Z85—Standardization of Library Supplies and Equipment. Scope: Definitions, specifications, dimensions, and methods of testing in the field of library supplies and equipment, exclusive of machine storage and retrieval.

ANSC PH5—Micrographic Reproduction. Scope: Standardization of terminology, definitions, sizes, formats, quality, apparatus, and procedures for the production and use of microform reproductions.

ANSC X12—Business Data Interchange. Scope: Standardization to facilitate the interbusiness and institutional electronic interchange relating to order placement and processing, shipment and receiving, invoicing, payment, and cash application data.

ANSC Z85 has as its secretariat the American Library Association (ALA), and its only standard to date is a key one for library sharing in the past decades—the specifications for permanent and durable library catalog cards. This standard set the size of cards and position of the rod hole, as well as the paper quality for catalog cards. ANSC PH5 has developed standards for microforms that have helped to stabilize both the size and reduction ratios of different types of microforms and to establish durability and quality specifications. While ANSC X3 standards affect many parts of library hardware and software, a prominent X3 standard used by the library community is the one for the basic Roman character set American Standard Code for Information Interchange (ASCII). The library community has also benefited from numerous X3 computer tape standards that are used with the library tape

exchange format. ANSC X12, which was organized in the late 1970s, will be establishing standards for invoicing and ordering that could affect library purchasing procedures.

ANSC Z39 is obviously, however, the standards-developing committee of ANSI that is most important to the library community. By combining into one committee library, information science, and publishing interests, Z39 standards frequently take into account wider interests than those developed by ALA for the library community. At the present time Z39 has fifty-six member institutions, of which approximately 53 percent are libraries or library support organizations, 20 percent are information services, and 27 percent are publishers. Z39 has been responsible for the development of a variety of standards, primarily of the rule and technical specifications type, including standards for the physical layout of library material, for Romanization, for collection of statistics, for citation through text and numbers, and for format structure in machine-readable data exchange.³

ANSI monitors the scopes of the ANSCs and other ANSI-affiliated standards groups to avoid duplication of effort, and is currently in the process of increasing these information exchange activities. ANSI also provides the means for nationwide review of standards that are potential American National Standards. When all reviews are completed, ANSI checks the process by which a standard was developed, and only if it meets the ANSI consensus criteria will ANSI publish the standard. The approval process within ANSC Z39 and other ANSI groups emphasizes extensive review and agreement from all interested member organizations. The role of ANSI vis-à-vis the standards it publishes is one of oversight and publicity. It does not support the ANSCs financially nor dictate in any way the content of their standards.

International Organization for Standardization

ANSI coordinates the volunteer standards development efforts in the United States and many other countries likewise have nationally recognized volunteer standards organizations—British Standards Institute in Great Britain, Association Française de Normalisation in France, Deutsches Institut für Normung in the German Federal Republic, and Standardiseringskommissionen i Sverige in Sweden, to name a few. By the middle of this century the impact of “world shrinking” technology emphasized the need for coordination among these national standards bodies; thus, in 1947 the International Organization for Standardization (ISO) was created. The areas of standardization supported in ISO range from engineering to farming, covering all fields—except

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electronics and electrical engineering, which are handled by its counterpart in the electrical/electronics fields, the International Electrotechnical Commission. Like ANSI, ISO is a voluntary standards-developing organization. ISO sees use of its standards occurring through two channels: direct use of the standard by organizations, or incorporation of the standard into a national standard, the latter being as important as the former.

The ISO members are the national standards institutes from countries around the world. These national standards organizations may be governmental or may be voluntary, as is the U.S. member ANSI, but ANSI is an exception. The majority of the ISO member bodies are government-supported within their countries. At the present time there are over eighty member countries of ISO, approximately two-thirds of which are developing countries.⁴

ISO has a hierarchical structure for its standards development work. It is administered by the General Assembly (all ISO members) and the Council (eighteen General Assembly members). Technical Committees (TC), with their supporting Subcommittees (SC) and Working Groups (WG), are formed to oversee the actual development of standards in specific areas. The most important Technical Committees to the library field are TC 6, Paper, Board and Pulp; TC 37, Terminology; TC 42, Photography; TC 46, Documentation; and TC 97, Information Processing Systems. The TC whose work most closely parallels that of ANS Z39 is TC 46, with a scope of standardization of practices relating to libraries, documentation and information centers, indexing and abstracting services, archives, information science, and publishing. Accordingly, the following Subcommittees and Working Groups have been formed under TC 46.

SC 2, Conversion of written languages

SC 3, Terminology of documentation

SC 4, Automation in documentation

 WG 1, Character sets

 WG 3, Bibliographic filing

 WG 4, Format structure

 WG 5, Protocols

SC 5, Mono- and multi-lingual thesauri

SC 6, Bibliographic data elements

 WG 1, Data element directory

 WG 2, Codes and numbering systems

SC 7, Presentation of publications

While the central headquarters and staff of ISO are in Geneva, the administrations of the TCs are distributed among the member bodies and supported by those member bodies. At the present time Germany holds the secretariat for TC 46, and the United States for TC 97. Likewise, the Subcommittees and Working Groups are maintained in a decentralized fashion, and Sweden serves as secretariat for TC 46/SC 4, while Canada serves TC 46/SC 6.

The actual writing of standards usually takes place at the lowest hierarchical level—in the Subcommittees or Working Groups. When a standard is acceptable to the WG members, it is circulated to the members of the sponsoring Subcommittee as a draft proposal. Following approval of the draft proposal, the new standard undergoes a further ballot among members of the TC. After each ballot the standard goes back to the WG for resolution of negative aspects, as the lowest level body remains the active participant in the process. This review process is extensive, and a major factor in the time required for completion of an ISO standard, but it also leads to wider acceptance of the standard. Because of the expense and difficulty of holding meetings of members spread throughout the world, much of the work of TC 46 and its Subcommittees and Working Groups takes place through the mail. Every two years, however, a plenary meeting of TC 46 is held following which its SCs and WGs usually meet.

ANSI activity in ISO Working Groups takes place through the corresponding ANSI committees. Thus ANSC Z39 handles for ANSI recommendations concerning all standards activities that take place in TC 46.

ISO Standards

In the library and information areas, ISO standards have indeed been used and have influenced U.S. national standards. The International Standard Book Number (ISBN) and International Standard Serial Number (ISSN) were both standards activities that began in ISO (although early work in serial numbering did take place in ANSI). These two standards correspond to the subsequently developed ANSI Z39.21, "Book Numbering," and ANSI Z39.9, "International Standard Serial Numbering." Likewise, the ANSI standard for country codes is based on the ISO standard, and the two will become even more alike after the upcoming review. As was noted earlier, many ISO standards are derived from national standards, and ANSI has been responsible for a number of "seed" international standards including Z39.2, "Bibliographic Information Interchange on Magnetic Tape," which gave rise

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to ISO 2709, "Format for Bibliographic Information Interchange on Magnetic Tape."

ISO and ANSI

One of the major organizational differences between ANSI and ISO is in the voting membership. In ANSI, members may be private firms, government departments, trade associations, or even other standards-making organizations; in ISO, the members must be the leading national standards body from each of the member countries of the world. The effect of this difference is that the American Library Association, the leading library organization in the United States, can be a member of ANSI and help formulate library comment on standards developed there, whereas IFLA, the *international* association of libraries, cannot be a voting member of ISO. The natural overlap of standards activities between ISO and IFLA are thus coordinated by liaison relationships, informal reports, and review of ISO draft standard drafts by IFLA.

LIBRARY ASSOCIATIONS

ANSI and ISO are the volunteer standards-setting groups that most affect libraries. However, the standards set by the library professional organizations, ALA and IFLA, have greater impact on libraries in many areas. ALA and IFLA concentrate their attention on library problems; thus, while they engage in many other activities besides standard development, the standards and guidelines that they do create are widely used.

American Library Association

The American Library Association is the largest library association in the United States, representing many types of libraries and many kinds of library activity. While development of standards is not its principal activity, practically any type of project undertaken by its diverse membership raises a need for standards.

Organizationally, ALA is divided into units (divisions, sections, round tables) that concentrate their attention on a specified area of librarianship and/or library service. The major units, the division, can be categorized as type-of-library or type-of-activity, with the Public Library Association exemplifying the former and the Resources and Technical Services Division representing the latter.

ALA Committee on Standards

Standards work in ALA is coordinated by the ALA Committee on Standards. Two factors led to the creation of a Committee on Standards at the ALA level approximately a decade ago: the awareness of the importance of standards to librarianship, and the possibility of confusion due to lack of a vehicle to coordinate the many efforts throughout the organization. Since the focus of the activity in each of the ALA units follows the area of interest of that unit, there was frequently an overlap of effort when different units isolated a need for a standard that was common to more than one unit. The Committee on Standards is thus responsible for ensuring that the many ALA units develop meaningful and useful standards with minimal duplication of effort.

In order to carry out its charge, the committee sets procedures for the preparation of standards that will ensure consistency with the policies established, reviews existing standards for their continuing relevance to libraries, recommends the establishment of new standards to appropriate units within ALA, and collects and disseminates standards to the community from within ALA and other national and international organizations. Basically the committee sets policy for standards developed in the ALA.

Standards developed within ALA may be prepared and officially adopted by ALA at two levels: the standard may be developed and adopted by a type-of-library unit, or any unit may develop a standard which is then forwarded to ALA Council for ALA-wide adoption. Thus, at the present time, only type-of-library units have the autonomy both to develop and to adopt standards. Adoption of a standard by a division may be carried out in various ways, among which are through vote of the division membership, through approval by an authorized committee of the division, or through the vote of the division board. In addition, all standards, regardless of whether they come from a type-of-library or type-of-activity unit, must be approved by the Committee on Standards. A revised handbook which sets forth the details for developing ALA standards, as well as describing the prescribed content, style and format of a standard, will be published by the Committee on Standards in 1983.⁵

ALA is involved in the development and adoption of all three types of standards—guidelines, rule and technical—but standards development activity concentrates on the first two. The many committees within the various professional units reflect this variety of activity, e.g., the Resources and Technical Services Division's (RTSD) Cataloging Description and Access Committee, which reviews and comments on any proposed revision to the Anglo-American Cataloging Rules; the

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American Association of School Librarians' Standards Program and Implementation Committee, which is active in school library media standards; the Association of College and Research Libraries' (ACRL) Standards and Accreditation Committee, which directs the development and maintenance of guidelines and standards for academic libraries; the Standards Committee of ACRL's Rare Books and Manuscripts Section, that serves as the ALA body responsible for all matters involving standards of rare books and manuscript collections; the Library and Information Technology Association's (LITA) Technical Standards for Library Automation Committee, which supports the development of standards related to library automation; and the joint RTSD, LITA and Reference and Adult Services Division committee that reviews standards concerned with the exchange of machine-readable data. This latter committee is an example of the interunit cooperation on common standards that the Committee on Standards fosters.

ALA plays an important role in establishing service guidelines for different types of libraries—a logical concentration for the Association. ALA has over thirty guidelines for a variety of library areas, from minimum standards for public library systems, to national interlibrary loan code, to guidelines for library service programs to jails.⁶

ALA and ANSI

ALA has a long history of interaction with ANSI. In 1939, ALA, along with the American Association of Law Libraries, Medical Library Association and Special Libraries Association, petitioned ANSI (then called the American Standards Association) to establish a committee with primary interest in libraries. ANSI did form such a committee—ANSC Z39—and ALA served as its first secretariat from 1939 to 1951. (Since 1951, the Council of National Library Associations, of which ALA is a member, has held the secretariat.) ALA has also worked with ANSC Z85, for which ALA currently serves as secretariat. Because of its continuing involvement in ANSC Z39, ALA was asked in 1977 to serve on the National Commission on Libraries and Information Science task force that studied the scope, and organizational and financial structure of ANSC Z39.

ALA is a voting member of ANSC Z39 and takes an active interest in all library-related standards developed by the committee. The Resources and Technical Services Division serves ALA as the coordinator of ALA-wide reviews of ANSC Z39 proposed standards.

International Federation of Library Associations and Institutions

The International Federation of Library Associations and Institutions had its beginning in 1927. It is a nongovernmental, nonprofit association founded "to promote international understanding, cooperation, discussion, research, and development in all fields of library activity, including bibliography, information services and the education of personnel, and to provide a body through which librarianship can be represented in matters of international interest."⁷ These objectives are carried out through a variety of activities such as basic research studies, conferences and meetings, publications, collaboration with other international organizations, training, etc., in which standards continually play a major role. IFLA by its international nature must focus on standards that ease communications by normalizing the practices of various countries.

The membership of IFLA consists of association members such as library and library school associations, institutional members such as libraries and library schools, and honorary members such as past presidents or individuals recognized for outstanding services. IFLA also recognizes a status of "affiliation" for institutions not principally concerned with library activities but supporting the purposes of the organization, and for individuals also supporting the purposes of IFLA but not representing an association or institution.

A major part of the professional activity in IFLA is organized in divisions which are made up of member representatives. At the present time there are eight divisions which may be categorized, as with ALA, as type-of-library or type-of-activity divisions. These are: (1) General Research Libraries, (2) Special Libraries, (3) Libraries Serving the General Public, (4) Bibliographic Control, (5) Collections and Services, (6) Management and Technology, (7) Education and Research, and (8) Regional Activities. The IFLA divisions are made up of sections organized according to particular interests within the scope of the division. For example, the Division on Bibliographic Control contains the Section on Cataloging. Both divisions and sections may also establish round tables and working groups. The decisions to work on standardization in particular areas are usually made at the division and section levels, although the actual work is carried out in working groups. The sections provide general review of the work of the working groups.

IFLA has three major professional programs, namely, Universal Bibliographic Control (UBC), Universal Availability of Publications (UAP) and International MARC program. There presently exist UBC

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and UAP offices to support these programs, and funds are being sought to establish an International MARC office. There is also an IFLA Office for International Lending with the principal responsibility for facilitating international lending. These offices are staffed with full- or part-time IFLA employees.

The UBC office serves as a coordinating agency for the UBC program, the objective of which is "to make universally and promptly available, in a form which is internationally acceptable, basic bibliographic data on all publications issued in all countries"—a mission obviously dependent on standards.⁸ The office has within its purview concern with standards pertaining to bibliographic control, such as cataloging rules and practices and bibliographic descriptions. The UBC office thus serves as secretariat to IFLA divisions, sections and working groups developing cataloging or technical standards, and contributes significantly to the development of these standards. In addition, the office performs a variety of research tasks aimed toward further standardization in cataloging practices. The UBC office also undertakes a vigorous publishing program to assure wide dissemination of IFLA standards.⁹

The objective of the UAP program is to make library material available wherever and whenever it is needed. The office has initially concentrated on research into the present situation in document access to identify problems and analyze possible solutions. UAP has just begun to work in the standards area, with development of guidelines for the compilation of union catalogs and union lists of serials currently underway.

A major set of standards developed by IFLA for the library community has been the International Standard Bibliographic Description (ISBD) which specifies the requirements and standardizes the presentation form of bibliographic descriptions. The sections on cataloging, geography and map libraries, serial publications, and rare and precious books and documents have produced the ISBD for many forms of material. The ISBD program is administered by the UBC office which is responsible for the review, maintenance and publication of the standard. The activities of the Section on Cataloging also include the establishment of the ISBD for Component Parts, preparation of an ISBD manual of examples illustrating problem areas, chairing the ISBD five-year review, and work on standardization of headings such as corporate headings and uniform titles.

Another major IFLA standardization effort was the development of UNIMARC, the format to be used by national bibliographic agencies.¹⁰

It was a cooperative effort of the Section on Information Technology with the Section on Cataloging. Due to the lack of standard international cataloging codes and practices, the national MARC formats differed in data content and content designation, although most follow the ISO standard format structure. The UNIMARC format was built on ISO standards and on the IFLA ISBD standards. In these parts of the cataloging entry which are national in nature, such as name headings, or dependent on language, such as subject headings, standard content designation was imposed on top of national practices. Thus, the resultant record would uniquely identify an item in a standard way, and the recipient of the record would have an option of accepting or rejecting those elements of the record for which there are no international standards.

Both the sections on cataloging and information technology are also collaborating on the design of various aspects of an International Authority Control system. This latter effort includes a standard for a printed authority record, the design of an international authority number, and the extension of the UNIMARC format to facilitate the exchange of authority records.

From the foregoing it can be seen that IFLA concentrates on library community standards of the guideline and rules type—areas where agreement within the whole information community would be ideal but extremely difficult to obtain. IFLA itself has the task of reconciling national practices when developing standards, a factor that greatly influences the work it undertakes.

ALA is a member of IFLA and as such participates in the review of IFLA standards during development stages. The IFLA standards approval process includes extensive international reviews by its members and other standards organizations such as ISO.

IFLA also has liaison with ISO and encourages the use, within the library community, of ISO standards that are primarily technical but required for library work. Some of the areas of standardization in ISO TC 46 in which IFLA is also concerned are:

1. Format structure—IFLA adopted the ISO standard for UNIMARC and developed the content designation required for the library community.
2. Transliteration—IFLA reviews ISO efforts for the library community and accepts ISO standards.
3. Code lists—IFLA reviews the work and, where applicable to the library community, adopts the ISO standards.

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4. Character sets for bibliographic use—IFLA has adopted these sets for use with UNIMARC and will continue to review new sets as they are developed.
5. Data dictionary development—IFLA reviews this work to make certain library needs are considered.
6. Protocols—Since protocol standards are going to be needed for future computer-to-computer links between library systems, IFLA reviews the work in progress.

Other Library Associations

Standards work is also carried out within the specialized library associations such as Special Libraries Association, Music Library Association, and Medical Library Association. Each is influential in the establishment of standards for its constituencies and for providing special sector comment on ALA and ANSI standards.

COOPERATIVE STANDARDS ACTIVITIES

There are at least three major cooperative activities among national libraries that have an impact on library standards: (1) the Joint Steering Committee for Revision of Anglo-American Cataloging Rules; (2) the Conference of Directors of National Libraries, with its International MARC Network Study: Steering Committee; and (3) the Association of Bibliographic Agencies of Britain, Australia, Canada, and the United States. These groups differ from the organizations described earlier in that they are voluntary cooperative efforts among institutions rather than being institutions themselves. These activities and their influence on library standards are described below.

Joint Steering Committee for Revision of AACR

Cataloging rules are a key standard for libraries. The leading rules standard used by libraries in the United States and many other countries is the Anglo-American Cataloging Rules (AACR). A standards-making group came into being in the early 1970s expressly for the purpose of revising the 1967 edition of AACR. Following the publication of the second edition of AACR, it was decided to maintain this Joint Steering Committee for Revision of AACR (JSCAACR) as a permanent group to approve changes and interpretations to the rules. This standards group

thus acts as the maintenance body for the standard, as changes are not allowed without JSCAACR approval. The JSCAACR is made up of representatives of the primary library associations and national libraries of the United States, Great Britain, Canada, and Australia. The members of the group are responsible for soliciting the opinion of their constituencies in casting votes on the standard. Thus, ALA provides both review of the standard and recommendations for votes on the AACR standard.

Conference of Directors of National Libraries

In 1974 a group of national librarians met and formed the Conference of Directors of National Libraries (CDNL). From the beginning, a principal topic that concerned the group was the international exchange of bibliographic data in machine-readable form—an area in which pressure was building for additional standards. During the period 1967-75, MARC projects were begun in the national bibliographic agencies of many countries. As described earlier, all of these MARC systems follow the international format structure standard, thus providing a level of standardization among the various national systems, but each format differed in content designation. Early bilateral agreements were being made by several of these national agencies for the free exchange of MARC records for the imprints of their respective countries, but this exchange was hindered by both format differences and nonstandardization of exchange agreements. CDNL organized a steering committee, made up of staff from national libraries, that became known as the International MARC Network Study: Steering Committee (IMNS:SC). It is to study aspects of international data exchanges, develop suggestions for standardization, and report to the CDNL.

The results of several studies that were undertaken by IMNS:SC showed the need for standards for international cataloging rules and practices, the need for protocol standards to facilitate exchange of bibliographic records in machine-readable form via telecommunications, and the need to investigate the copyright issue as it affected the supply and receipt of machine-readable records between national agencies. It was found that because of national copyright laws and other national institutional considerations, a given agency could have a different exchange arrangement for each country with which it exchanged data. A further study reported that: (1) the national bibliographies of the various countries need to be protected against publication by any other organization; (2) national records need to be modified to the extent that

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basically a new record is created, if the record is to be distributed outside the exchange partner's institution; (3) there are significant problems in the determination of what constitutes a substantial modification; and (4) it is extremely difficult to monitor the use of records once these records are transferred to another computer-based system. The report suggested a model exchange agreement that embodied a set of guidelines to take account of these difficulties. This model exchange agreement, as modified by the IMNS:SC, was endorsed by CDNL.¹¹ During the late 1970s, the CDNL came under the IFLA umbrella, and the IFLA UBC office now acts as secretariat to the IMNS:SC work.

The IMNS:SC continues to work on problems that are interfering with the exchange of data between national libraries through testing of the IFLA standard UNIMARC and encouragement to IFLA to establish an International MARC office. This latter office, if set up under IFLA, would be largely responsible for the development and maintenance of the standards required for successful international data exchange. It would be concerned with technical standards, such as protocols and format structures, and as such would need to maintain a close relationship to ISO.

Association of Bibliographic Agencies of Britain, Australia, Canada and the United States

The Association of Bibliographic Agencies of Britain, Australia, Canada, and the United States (ABACUS) was established in 1977 to facilitate international cooperation among the national bibliographic agencies of the four countries. The aim of the four national libraries is to ensure, insofar as possible, that common procedures, compatible guidelines, and standards are implemented by the individual agencies to make the most effective use of the exchange of bibliographic data.

While ABACUS itself is not a standards-setting body, international standards and guides emanating from such organizations as ISO and IFLA which are relevant to the national agencies and the libraries in each of its respective countries are considered, and the group becomes a strong force toward implementation of standards. The topics considered by ABACUS over the years have included implementation of the second edition of AACR, rule interpretation and acceptance of common options, filing rules, national MARC formats, UNIMARC, policies governing the exchange of machine-readable records, network protocols, a common thesaurus for geographic names, vernacular scripts, Romanization, transliteration standards, and Cataloging-in-Publication.

This work on standards implementation is important since the standards adopted by the national bibliographic agency of a country have an impact on its national constituency. Thus, the Library of Congress works closely with U.S. library associations such as ALA and the Association of Research Libraries, and also with ANSI. Likewise, the national bibliographic agency, because of its responsibility as a country's interface with other national bibliographic agencies, interacts with international institutions and international standards associations; for example, the Library of Congress works closely with IFLA and with ISO.

FEDERAL STANDARDS—NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards (NBS) is the principal government-controlled standards organization of the United States and is included here because of its contribution to technical standards development. NBS is frequently a leader in setting standards, and because of the size of the federal sector, its standards are influential as a result of both direct use and input to standards subsequently developed by other organizations.

Established in 1901 as part of the U.S. Department of Commerce, the primary mission of NBS is to enhance scientific and technological developments within the United States and to facilitate the application of these developments in the best public interest. Included in this mandate is the development of standards needed by federal agencies. To achieve this goal, NBS performs research, conducts tests and provides various scientific and technological services, primarily for the federal government but also for industry.¹²

Of particular importance to the library and information science community is the work of the NBS Institute for Computer Science and Technology (ICST). Established in 1965, ICST provides advisory services to federal agencies to support the formulation and development of automatic data-processing functions and conducts research in computer science and technology. As an integral part of these activities, the institute develops and recommends federal information processing standards aimed at increasing the economy and effectiveness of government computer operations (particularly the improved compatibility, interchange and performance of machines and programs). In addition, ICST also participates in the development of voluntary commercial and

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private sector ADP standards through ANSI and other groups. The data-processing standards and guidelines developed by NBS for the federal government are issued by ICST in a standards series—Federal Information Processing Standards (FIPS). FIPS publications are available from the National Technical Information Service (NTIS) and cover numerous categories, including software, hardware, quality control, safety and security, character sets, and data transmission. These standards, often produced in cooperation with other government agencies, are extensively reviewed by government agencies and, following approval by the Secretary of Commerce, must be used in all federal installations (except by special waiver). While aimed primarily at federal computer use, the application of these conventions influences computer practices in the private sector as well.

It should be noted that the federal sector does not rely solely on NBS standards in its procurement processes. Rather, there is a concerted effort, as specified in Office of Management and Budget (OMB) *Circular A-119* published in 1980, to use applicable voluntary standards where possible. This circular also calls for active participation by federal agencies in the development of private sector voluntary standards.¹³

STANDARDS FOR INFORMATION SERVICES

Abstracting and indexing (A&I) services such as Chemical Abstracts have always had a close relationship to libraries. They, like libraries, “catalog” texts and build tools for accessing these catalog citations. The citation services are supplied to users through libraries, and the texts that match the citations are supplied by libraries. Yet, A&I services adhere to standards for preparing and arranging citations that vary from those followed by libraries. This results partly from basic differences in the material cited—A&I services work primarily with journal article citation, and thus have only limited concern with physical description and item location information. Instead, they carry on a tradition of concentration on in-depth subject description of works. In addition, these services have tended toward subject specializations which result in little need for cooperation and interchange among them. There are, however, two associations of A&I services described here whose activities include development and encouragement of use of standards, and these A&I standards are potentially very important to libraries. In addition, the extensive internal standards activity of one of these services is described.

National Federation of Abstracting and Indexing Services

Established in 1958 as the National Federation of Science Abstracting and Indexing Services, the word *science* was dropped from the name in 1972—recognizing that abstracting and indexing problems or issues are common to all disciplines, not just science and technology. NFAIS takes as its primary purpose the encouragement and improvement of abstracting, indexing and analyzing of literature in all fields of knowledge. NFAIS thus functions as a communication forum, not only for its member services, but also between its membership and other information communities (both nationally and internationally).

NFAIS encourages cooperative efforts and coordinated programs within its membership. The growing production of large bibliographic services in machine-readable form has caused standardization to become a concern of abstracting and indexing services and their users, such as libraries, document delivery systems, and primary publishers. Acknowledging these concerns, NFAIS fosters the development of acceptable standards and encourages their implementation by its member organizations. This is accomplished in a number of ways, including active voting membership in ANSC Z39 as well as participation in ANSC Z39 subcommittees responsible for standards of interest to A&I services, such as journal article identification designations, journal title abbreviations, writing abstracts, format for the interchange of bibliographic information on magnetic tape, and the ISSN.

Of particular interest to the library community is encouragement by NFAIS of more widespread use of standard identifiers for serial publications, such as the ISSN, serial key title and journal title abbreviations, as these standards help provide the links between A&I citations and library catalogs. To facilitate more efficient cooperation between libraries and A&I services, NFAIS and the Association of Research Libraries are exploring ways for carrying this information more completely and accurately in the CONSER (Conversion of Serials) file.

Members of NFAIS also participate in international standards activities, including ISO and Unesco working groups. Thus NFAIS and its member services actively encourage the development and use of standards appropriate for their own requirements, as well as those that are needed for cooperative efforts between them and other members of the community.

International Council of Scientific Unions Abstracting Board

The International Council of Scientific Unions (ICSU), the parent body of the Abstracting Board (ICSU-AB), is a scientific organization

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that is international but nongovernmental in nature. It comprises several autonomous international scientific unions, such as the International Astronomical Union and the International Union of Pharmacology, and more than sixty national members, such as scientific academies, research councils, or similar scientific institutions. The National Research Council of the National Academy of Sciences represents the United States in this international forum. The main purpose of ICSU, to encourage international scientific activity, is accomplished primarily through the planning and coordinating of international scientific research programs, such as the International Geophysical Year (IGY), as well as through providing a forum for the exchange of ideas, the communications of scientific information and the development of standards.

Within the ICSU family, the Abstracting Board (ICSU-AB) provides an international focus for the work of the world's scientific and technical A&I services. Established in 1952 as an outgrowth of a joint Unesco and ICSU commission organized to study the problems related to abstracting the scientific literature, the member services include A&I organizations from all over the world. In addition, national members provide representation from those sectors of the information community that would not otherwise be represented on the board but whose policies and practices can be influenced by the board's decisions, such as libraries, document delivery centers, and publishers. In the United States, the national members form a group called the United States National Committee for ICSU-AB. NFAIS plays a role in identifying individuals to be appointed to this committee, and serves as an associate member of the ICSU-AB as well. Thus there are in place effective lines of communication between NFAIS and its international counterpart.

As an international forum for the world's A&I services, ICSU-AB plays a prominent role in the promulgation of standards needed by these organizations largely through participation in other standards-making groups. Representatives from the board are often members of ISO technical committees and Unesco working groups dealing with practices and conventions utilized by the A&I communities. Of particular note was the work performed by the ICSU-AB in the preparation of the initial edition of the Unesco-published *Reference Manual for Machine-Readable Bibliographic Descriptions*.¹⁴ The *Reference Manual* is a cataloging tool designed for use by A&I services. This was a valuable cooperative effort involving direct or indirect representation of all the ICSU-AB member services, together with representation from organizations having special interests in mechanized information processing (including ISO, IFLA and others). Subsequent to the publication of this

manual, ICSU-AB was instrumental in encouraging its use by the member services—thereby facilitating a more uniform approach to the handling of bibliographic data by these organizations.

ICSU-AB representatives are also very active in the formulation of other international standards, including the ISO standard for journal title abbreviations and the draft guidelines for the bibliographic strip for serial publications. Also within the arena of standards activities relating to the handling of serial publications, ICSU-AB was highly instrumental in the initial formulation of guidelines for the International Serials Data System (ISDS) and the ISSN. Due to the efforts of the board, the original base file, upon which the current ISDS database was built, was composed of bibliographic records contributed by a number of its member services. This in turn served to foster increased voluntary use of the ISSN as a standard serial identifier by the A&I community.

International Nuclear Information System

Most A&I services such as Chemical Abstracts largely operate from central facilities at which the indexing and database creation activities take place. They are thus working in an “in-house” environment with respect to cataloging rules and other standards. There are several services that are built in a decentralized fashion, the International Nuclear Information System (INIS) and the Agricultural Information System (AGRIS) being leading examples. The INIS system is designed to receive input of citations from centers all over the world—the cataloging and record creation take place at the point of origin. Tapes are sent from these centers to the International Atomic Energy Agency in Vienna where they are processed and merged to create the INIS index. INIS is thus highly dependent on the following of standards by the various centers if the citations are to merge easily.

Accordingly, INIS has developed and published a complete set of standards to be used by the cataloging centers—cataloging rules, record format, code lists, name authority lists, and Romanization rules—trying when possible to base these standards on existing national or international ones. Thus, the tape format is an implementation of ISO 2709. As cooperative efforts get underway in the A&I community, these strong standards programs of agencies like INIS will greatly influence the development of A&I standards.

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FUNDS FOR STANDARDS DEVELOPMENT

The final three organizations whose standards-fostering activities are described may be classed as participating chiefly through sponsorship or funding of standards activities. While each may also have been responsible on occasion for the development of particular standards, all three work largely through other groups such as ANSI, IFLA and ISO by contributing financial support to their efforts.

Unesco

The United Nations Educational, Scientific and Cultural Organization was established in 1946 for the purpose of advancing, through the educational, scientific and cultural relations of the peoples of the world, the objectives of international peace and the common welfare of mankind. Unesco's activities fall into three general categories: promotion of peace, operational assistance (especially to member developing countries), and international intellectual cooperation.

A major program initiated to support these activities is the General Information Programme (GIP), which is established within Unesco's Bureau of Studies and Programming. GIP is an intergovernmental program concerned specifically with the development and promotion of information systems and services in the areas of scientific and technological information, documentation, libraries, and archives at the national, regional and international levels—thus an important program to libraries. An outgrowth of the Universal System for Information in Science and Technology (UNISIST) (formulated by Unesco in the early 1970s as a world science information system), GIP is managed by a director-general and is guided in its planning by an intergovernmental council of thirty member states as well as an advisory committee of individual experts. The needs of the U.S. national information community are formulated for presentation to GIP through the United States National Committee for Unesco's GIP.

The GIP promotes training of information specialists and application of modern techniques to data collection and processing, but the function of most interest here is the promotion and dissemination of methods, norms and standards for information handling. Through GIP, Unesco partially supported the development of the *Reference Manual* mentioned earlier and numerous other ISO and IFLA standards activities. In addition, the development and applications work that Unesco fosters adheres to Unesco-accepted standards.

An important project currently underway through GIP sponsorship is the work of the Ad Hoc Group on the Establishment of a Common Communications Format (CCF). This group was convened following an international symposium in 1978 that was organized by the UNISIST International Center for Bibliographic Descriptions (UNIBID), ICSU-AB, IFLA, and ISO—and also sponsored by Unesco. At this meeting, the conferees decided that it was desirable to have an international communications format to satisfy the needs of various segments of the information community such as libraries, national bibliographies, and A&I services. Thus Unesco undertook funding of this multicomunity standard. The CCF working group is made up of representatives from a number of international standards organizations, including ICSU-AB; International Center for Scientific and Technical Information, located in Moscow; ISO; IMNS:SC; UNIBID; and the Inter-Organization Board for Information Systems.

While the guidelines for recommendations which emanate from the GIP as a result of its various activities are not mandatory for the member states, they, nevertheless, are often voluntarily followed and can be influential in the evolution of international standards within ISO.

National Commission on Libraries and Information Science

The National Commission on Libraries and Information Science (NCLIS) was established by Congress in 1970 and charged with the responsibility for developing and/or recommending plans to ensure that the people of the United States, for whatever purpose, are provided with adequate library and information services. To achieve this goal, in 1973 NCLIS began work on its program document *Toward a National Program for Library and Information Services: Goals for Action*.¹⁵ Among the stated objectives are the planning, developing and implementing of a national network of library and information service, and included in the text is a discussion of the importance of standards and the need to encourage and promulgate them. Thus, from its outset, NCLIS recognized the essentiality of standards to build a cost-effective library and information service network.

The NCLIS itself does not have the organization to develop standards, but through funding, administrative support and involvement in the work of other institutions such as ANSI and ALA, has been a strong supporter of the standards activity. NCLIS interest in encouraging the development of standards led it to sponsor and provide the major portion of the funds for the investigation of the scope of work and

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organizational and financial structure of ANSC Z39 in the late 1970s and, following that study, provided funding to the Secretariat of Z39 to initiate the recommendations resulting from the study.

In 1975 NCLIS, along with the National Science Foundation and the Council on Library Resources (CLR), established and funded for three years an experiment in cooperation among the various segments of the library and A&I communities, the Committee on the Coordination of National Bibliographic Control (CCNBC), with the aim of working toward common standards. The emphasis of this effort included the definition of a minimum bibliographic record for item identification, the design of record formats for journal articles and technical reports not then included in the MARC family of formats, and a study of the problems of subject access across the various segments of the bibliographic community.

As a result of the many studies and programs sponsored by NCLIS over the years, commission funds have been used to encourage the participation of organizations in standards activities and the development of a wide variety of standards. Three important examples are briefly described here.

In the mid-1970s NCLIS funded a study to determine the role of the Library of Congress in the evolving national library and information service network.¹⁶ One recommendation was that the Library of Congress should play a coordinating role in the evolving network, partly by continuing its major efforts in standards development and by encouraging the use of these standards nationally and internationally. Based on the preliminary results of this study, the Library's Network Development Office was established and the Network Advisory Committee was formed—both organizations instrumental in standards work.

The NCLIS has funded several of the background tasks concerned with building and maintaining a network database, most of them standards-related. The extension of the MARC formats to cover series data and current work to develop more precise guidelines for the assignment of LC subject headings by institutions other than the Library of Congress, the subject counterpart of the descriptive cataloging rules, are two such standards projects.

The Technical Communications Committee of the Information Science and Automation Division of ALA was concerned in the mid-1970s with the establishment of a standard communications protocol to transmit messages in an online library networking environment. NCLIS supplied the funds to accelerate this effort through a task force which became known as the NCLIS/NBS task force for computer network protocols. Its report describing a proposed computer-to-

computer protocol was a landmark standards document¹⁷ and has served as the basis for further protocol developments currently underway by ANSC Z39.

Council on Library Resources

The Council on Library Resources, a private foundation, was established in the mid-fifties and is principally supported by funds from private foundations. Although CLR has an interest in all types of libraries, its primary concern has been with academic and research libraries. Its program focus, since it concentrates on current problems and issues, is a changing one, although the theme is the same, namely, the solution of library problems. In its latest annual report, bibliographic services, library resources and their preservation, library operations and services, professional education and training, and research and analysis are among the topics receiving the greatest emphasis. It appears safe to assume these same topics will be carried over into 1982 and the future.

CLR has a long history of supporting the development of standards. From 1961 to 1979, CLR supported ANSC Z39 directly. Funds were provided to the committee or its sponsor, the Council of National Library and Information Associations (CNLIA), for general support of ANSC Z39 activities. During the same period of time, CLR (in some cases jointly with other organizations) was a major catalyst toward effective resource sharing through standardization by its financial support of: (1) projects such as MARC, Retrospective Conversion (RECON), Cooperative MARC (COMARC), and CONSER; (2) committees such as CCNBC, JSCAACR, and the Network Advisory Committee; and (3) staff participation in national and international standards committee work. A quick review of the CLR's 1976 annual report is convincing of the impact of CLR on standards development.¹⁸

In 1980 CLR ceased providing general support to ANSC Z39 and began a program of supporting the development of particular standards relevant to its program interests where this work was being carried out within projects or by individuals or groups associated with ANSC Z39. In some cases, CLR sought the services of consultants to study and report on some facet of what appeared to be a required but missing guideline or standard.

Currently the majority of CLR's standards efforts falls under the consideration of the CLR Bibliographic Services Development Program (BSDP), a major activity with the goals "to provide effective

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bibliographic services for all who need them, to improve bibliographic products, and to stabilize costs (in constant dollars) of many bibliographic processes in individual libraries."¹⁹ Among the many efforts currently funded by CLR are:

1. a joint Committee on Bibliographic Standards, established to advise the Library of Congress on rule interpretation under the second edition of AACR and impact of the interpretation on shared cataloging systems;
2. preparation of a manual to assist in the use of the rule specifications given in AACR for the cataloging of machine-readable data files;
3. a paper reviewing the state of the art and recommending a standard institution identification code;
4. a paper reporting on an investigation of the requirements for detailed holdings statements;
5. development of a standard method for recording and communicating serials cancellations in an online union list;
6. further development of the NCLIS/NBS application-level protocol for the computer-to-computer interchange of data; and
7. a study to identify further work required to develop a standard indexing vocabulary for the fields of art and architecture.

In addition, CLR has been a major contributor to IFLA, funding projects and professional units.

SUMMARY

A variety of institutions and groups that affect, directly or indirectly, the promulgation of library standards have been described in this article. These include full-time standards-making bodies, library associations, national and international committees, government agencies, abstracting and indexing services, and funding agencies. The work undertaken by each is guided or influenced by the constituencies it is commissioned to represent. Thus a number of interrelated mechanisms are in place and continually evolving to reflect adequately the needs and requirements of a varied and diverse community in the area of standards development.

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