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# Librarians need standards

In an increasingly connected electronic environment, standards will become an even more important part of library and information work.

**David Haynes** and **Alan Hopkinson** provide a clear overview of the different categories of standards and guidelines used in the sector.

To a large extent, the practice of librarianship is defined by standards. They enable library and information workers to follow similar practices to their colleagues elsewhere – helping both themselves and their users. For example, using Dewey classification in a university library means that few readers will have to learn a new classification scheme since they are likely to have encountered it in their school libraries and in public libraries. Using Anglo-American Cataloguing Rules (AACR) and Marc formats enables records to be transferred between systems, and cataloguers know that this saves them from having to create all their catalogue records from scratch. Common cataloguing standards mean readers are able to search catalogues everywhere in a similar manner.

Preservation and conservation standards are used by collection managers, and increasingly library and information professionals have responsibility for records management and archives management, which are governed by standards.

Standards for service delivery are stipulated in national initiatives such as the UK Public Library Service Standards. Service managers use standards for performance measurement to help them evaluate and monitor service delivery.

Library standards can be grouped by their applications:

- Describing and identifying information resources
- Information exchange
- Managing collections
- Delivering services.

#### **Describing and identifying**

Perhaps the most fundamental area of standards work is identifying and describing information – whether it is books in a catalogue or information resources on a website.

Many library and information standards are guidelines advising particular practices. Take British Standard BS 1629:1989 *Recommendations for references to published materials*. It is a variant of proprietary standards such as Harvard and is related to ISO 690:1987 *Bibliographic references – content, form and structure* and ISO 690-2:1997 *Bibliographic references Part 2 – Electronic documents or parts thereof*. Cataloguing codes such as AACR2 are related in their function; like Harvard rules, AACR2 has never been made into a formal ISO (International Organization for Standardization) standard though it has the same

effect. Guidance for authors, publishers and editors also comes from: BS 5605:1990 *Recommendations for citing and referencing published material* and BS 6371:1983 *Recommendations for citation of unpublished documents*.

Some standards are used to describe the subject content of information resources and are widely used beyond the library and information domain. For instance, ISO 639-1:2002 and ISO 639-2:1998 deal with two-letter and three-letter codes, respectively, for languages. ISO 3166-1:1998 *Codes for the representation of names of countries and their subdivisions – Country codes* are used as the two-letter codes in URLs to designate country of origin. Fortunately these codes were originally developed long before the internet age or else, no doubt, a small country such as Tuvalu would never have been given TV, the selling of which earns it half its Gross Domestic Product!

Many LIS professionals are concerned with classifying and indexing information resources, or developing vocabularies and classifications for specialist collections. Some of the general classification systems such as Dewey Decimal Classification (DDC), Universal Decimal Classification (UDC) and the Root Thesaurus are actual standards or, in the case of DDC, de facto standards. The British Standards Institution (BSI) publishes the English-language versions of the complete and abridged UDC, as well as the online version, so it has the authority of a British Standard.

Standards that cover indexing include ISO 5963:1985 *Methods for examining documents, determining their subjects, and selecting index terms* and the related BS 6529:1984 *Recommendations for examining documents, determining their subjects and selecting indexing terms*. Arranging indexing and items in catalogues are covered by ISO 999:1996 *Guidelines for the content organization and presentation of indexes* and ISO 7154:1983 *Bibliographic filing principles*.

Thesaurus development is an area of considerable activity where the BSI is taking a leading role internationally. The long-established ISO 2788:1986 *Guide to establishment and development of monolingual thesauri* has been superseded in the UK by BS 8723-2:2005 *Structured vocabularies for information retrieval: Guide: thesauri to incorporate some of the lessons learnt from applying thesauri in machine-readable environments*. The second standard is ISO 5964: 1985 *Guidelines for the establishment*

and development of multilingual thesauri. Also of note is ISO 1987-1:2000 *Terminology work – Vocabulary – Part 1: Theory and application*.

ISO has a number of technical committees and subcommittees. One such, Technical Interoperability in Information and Documentation ISO TC 46 / SC 4, also oversees ISO 15511:2003 *International Standards Identifier for Libraries and Related Organizations* (ISIL) and a number of data element directories which cover interloan, acquisitions, information retrieval and circulation applications and data elements for the exchange of cataloguing and metadata.

Identifiers and metadata are covered by a subcommittee entitled Identifiers and Description, ISO TC 46 / SC 9. The bulk of the standards of SC 9 relate to international numbering. The best known of these is probably ISO 2108:2005 *International Standard Book Number* (ISBN) which has grown from 10 to 13 digits in the latest standard. ISO 3297:1998 *International Standard Serial Number* (ISSN) is currently under revision. Other important identifiers are: ISO 3901:2001 *International Standard Recording Code* (ISRC), ISO 10444:1994 *International Standard Technical Report Number* (ISRN), ISO 10957:1993 *International Standard Music Number* (ISMN), ISO 15706:2002 *International Standard Audiovisual Number* (ISAN) and ISO 15707:2001 *International Standard Musical Work Code* (ISMWC).

On the internet, Dublin Core has been widely adopted as a standard for describing web content. This metadata standard originally arose from an open, informal international collaboration and became a de facto standard. It was then adopted as a national standard in the US by the National Information Standards Organization (NISO) and is now an international standard, ISO 15836:2003 *The Dublin Core metadata element set*.

#### Information exchange

When exchanging information between systems, standards are essential. This is important for interoperability (where different systems are involved in a single transaction or series of transactions) and for migration of data to new systems. Many libraries now require their library management systems to be able to handle Marc21 (Machine Readable Cataloguing) records, for instance. This allows libraries to migrate their catalogues on to new systems, regardless of manufacturer, and to purchase standard bibliographic records from vendors. Marc was originally designed for the mass production of library catalogue cards, in the days when data processing was done on mainframe computers and access was severely limited. The current standard, Marc21, replaces USMarc and CanMarc (then Canadian Marc format) and is increasingly being adopted internationally. Like all the Marc formats it conforms to ISO 2709:1996 *Format for information exchange*.

Marc is very specifically aimed at producing catalogues, but in the last decade or so the book trade sector has become interested in bibliographic records for a wider range of functions. A standard known as

Onix has been developed by Editeur, the International Group for Electronic Commerce in the Book and Serials Sectors. Again, as in the case of Marc, this is a de facto standard and used generally across the sectors, though it has never been formalised as an international standard. The data is expressed in XML, which is widely used across many sectors, rather than ISO 2709 (see above). Earlier, Editeur worked with EDI for the book industry which was based on ISO 9735: *Electronic data interchange for administration, commerce and transport* (Edifact) which was developed outside the book trade by commerce in general and was originally sponsored by the United Nations. In the UK, BIC (Book Industry Communication) is the lead body in these activities spanning the library world and the book trade.

One of the most famous standards in the LIS field is the NISO standard Z39.50-2003

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*Information retrieval: application service definition and protocol specification* (also adopted as ISO 23950) which allows the development of virtual union catalogues. Z39.50 develops standard protocols for searching which can be incorporated into a search engine (in an Opac or library management system, for instance) to search other catalogues even though they may be mounted on different systems. NISO has also produced Z39.88-2004 *OpenURL framework for context-sensitive services*, which enables catalogues of books and journal articles or lists of bibliographical references to link to a preferred source, for an electronic resource which is available at more than one location.

There are several international standards which cover the way in which characters are coded and transliterated. The Unicode standard is based on the character set of ISO/IEC 10646:2003 *Universal Multiple-Octet Character Set* (UCS) which allocates a computer code for the representation of the majority of the world's scripts. This is based on Ascii (an equally important ANSI standard) which allocates numeric values to each character in the Latin alphabet, so that '@' gets a value of 64, 'A' of 65, and 'a' of 97. The library world was first in the field in requiring non-Latin scripts to be produced by computers and for transliteration of non-Latin scripts. ISO Technical Committee 46, which deals with libraries and information science, is responsible for standards for transliteration of non-Latin scripts:

ISO 9:1995 *Transliteration of Cyrillic characters into Latin characters*  
 ISO 233:1984 *Transliteration of Arab characters into Latin characters*  
 ISO 259:1984 *Transliteration of Hebrew characters into Latin characters*  
 ISO 843:1997 *Transliteration of Greek characters into Latin characters*  
 ISO 3602:1989 *Romanization of Japanese*

(*Kana script*)

ISO 7098:1991 *Romanization of Chinese*

Metadata is a key resource for information exchange and, apart from Dublin Core, there are standards dealing with the exchange of metadata: ISO 8459-5:2002: *Bibliographic data element directory – Part 5: Data elements for the exchange of cataloguing and metadata*; and ISO/IEC 11179-1 to -6 *Metadata registries* (MDR).

#### Managing collections

Collection management includes standards for conserving materials, management of processes and housing of collections. Some aspects of collection stewardship are covered by:

ISO 11108:1996 *Archival paper. Requirements for permanence and durability*  
 ISO 11799:2003 *Document storage requirements for archive and library materials*  
 ANSI/NISO Z39.48 – 1992 (R2002) *Permanence of paper for publications and documents in libraries and archives*  
 ANSI/NISO Z.39.78 – 2000 *Library binding*  
 ISO 14416:2003 *Requirements for binding of books, periodicals, serials and other paper documents for archive and library use. Methods and materials*  
 There is even a NISO standard for library shelving: ANSI/NISO Z39.73 – 1994(R2001) *Single-tier steel bracket library shelving*.

Records management has been the focus of considerable activity in recent years and the current international standard, based on the Australian national standards, was published in 2001:

ISO 15489-1:2001 *Records management – Part 1: General*  
 ISO/TR 15489-2:2001 *Records management – Part 2: Guidelines*  
 And more recently:  
 ISO 23081-1: 2006 *Records management processes. Metadata for records. Part 1: Principles*.

Many libraries have started using RFID (radio-frequency identification) tags to manage circulation and loans (CILIP's second RFID in Libraries Conference takes place on 15 November). Several standards are emerging for bibliographic data on RFID tags – there is as yet no international consensus on the issue. Some manufacturers are also concerned about keeping a competitive edge with their proprietary systems and are applying for patent protection before a standard is agreed. NISO is currently investigating this area, and the Danish Standards Institute has probably gone furthest in developing a standard. An ISO TC46 working group is developing a standard data model for encoding information on RFID tags used in libraries and it is likely that a new international standard will eventually emerge.

#### Delivering services

Several countries have worked on standards for service delivery. For instance the Department for Culture, Media & Sport (DCMS) has published Public Library Service Standards. In order to monitor service delivery, performance measures have been developed and there are several ISO standards for performance measures specifically aimed at

libraries:

ISO 11620:1998 *Library performance indicators*

ISO 11620 Amd.1:2003 *Library performance indicators. Amendment 1: Additional performance indicators for libraries*

PD ISO/TR 20983:2003 *Performance indicators for electronic library services*

Performance indicators for electronic library services are rapidly developing and are dealt with comprehensively in *E-Metrics for Library and Information Professionals* (Facet Publishing, 2005).

Many sectors monitor library performance and produce library statistics – see ISO 2789:2003 *International library statistics*. Unesco produces a series of statistics, as do several bodies in the UK such as Lisu, Sconul (Society of College, National and University Libraries) and CIPFA (Chartered Institute of Public Finance and Accountancy).

#### Where are standards going?

Standards will continue to consolidate in emerging areas, such as RFID technology, as it becomes more widely adopted in libraries. There will be more development of standards concerned with information exchange as the internet develops and we see new ways of operating on Web 2.0. Metadata in particular has developed in the last five years in response to new demands placed on electronic information systems, and we believe that new metadata schemas will emerge in new areas of application. We are less certain that performance standards will be adopted globally, because the library environments vary so much around the world, although it seems likely that standards will consolidate in the UK. However, there will be increased interest in standards for measuring performance, as managers and politicians seek evidence to support their decision-making.

Standards are an important part of library and information work and in an increasingly connected electronic environment we believe that they will become even more so. Library and information professionals will need to understand which standards apply to their work. Even more importantly they will have a significant role to play in the development of new standards concerned with information management and retrieval. ☺

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*The authors wish to thank Pat Harris, former Executive Director of NISO, for her guidance on standards in the US and feedback on this article.*

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## Standards bodies and further information

### International Standards Organization (ISO)

ISO is a United Nations body based in Geneva. It acts as an international co-ordinating body and clearing house for approval of international standards and operates by means of committees with nominees from member countries. Standards often originate from professional associations or national institutions needing to promote standard methodologies within their constituency. These standards are then proposed to a national standards body before being offered to ISO for international standardisation. A draft standard is normally proposed to the appropriate ISO committee as a 'new work item' which has to be voted on before work can begin. ISO also publishes a monthly newsletter, *ISO Focus*, the March 2006 issue of which looks at knowledge management.

### American National Standards Institute (ANSI)

Have you ever wondered why so many standard numbers begin with Z? Z39.50 *Information retrieval* is the best known but there is also Z39.71 *Holdings statements for bibliographic items*, Z39.48 *Permanence of paper* and Z39.68 *Specification for the digital talking book*. The American National Standards Institute (ANSI) is the major central voice for consensus standards development in the US. Its role is to accredit independent standards developers, rather than developing its own standards. Standards developed by ANSI-accredited organisations are branded as American National Standards. Almost 400 standards developers are ANSI-accredited. However, it is important to note that in the US there are more than 8,000 standards developers and consortia. The National Information Standards Organization (NISO) ([www.niso.org](http://www.niso.org)) is the ANSI-accredited standards organisation that creates consensus standards used by libraries, publishers, content and knowledge-based businesses, and technology developers. The ANSI-assigned prefix 'Z39' identifies all ANSI/NISO standards.

### British Standards Institution (BSI)

In the UK, the situation is clearer than in the US because the BSI ([www.bsi-global.com](http://www.bsi-global.com)) deals with all areas of national standardisation. In Germany the standards body is DIN (remember before digital cameras when films used to be labelled 100 ASA / 21 DIN, not to mention DIN plugs for cabling) and in France it is AFNOR. All these bodies are members of the ISO.

### Professional bodies and other institutions

The national standards bodies are not the only standards makers. Professional bodies and trade associations are involved: AACR is the joint activity of a number of national institutions and professional bodies including CILIP and the British Library. Book Industry Communication (BIC), supported by CILIP, the BL and the Publishers Association, works to develop standards on behalf of the book trade. BIC hosts one of the BSI committees, IDT/2/18 Identifiers and Metadata. The National Archives hosts IDT/2/17 Archives and Records Management, which provided UK input to BS ISO 15489 *Records management*. The Museums, Libraries & Archives Council also promotes standards and has produced *Standards and Guidelines for Museums, Libraries and Archives in the UK*, as well as promoting the Public Library Service Standards published by its sponsoring department DCMS. In the international arena, IFLA (International Federation of Library Associations) has produced guidelines and de facto standards, notably UniMarc, which is an international Marc standard designed to be free of any national or language bias.