USER NEEDS IN IT STANDARDS

STANDARDS FOR INFORMATION AND THE CONTROL OF INFORMATION

Information

Information is notoriously difficult to standardize and even more difficult is the standardization essential to improve the efficiency of the retrieval of information stored in computer databases; information is, of course, no use unless it can be appropriately selected or retrieved. Many standards in the field are quite well established and some pre-date automation.

Another feature of information is its international nature. Information generally knows no bounds, though its expression through the medium of a language limits its use to those conversant with that language. Indeed, it is the universality of information that makes it necessary to conduct IT standardization at the international level.

What does the I of IT really mean on its own? The Concise OED defines 'information' as "items of knowledge"; 'knowledge' as "familiarity gained by experience, person's range of information"; 'data' means "facts of any kind". Data in fact can exist without being known by anyone. Most people would agree that a computer could contain some calculated figures which no human knew about. These would be data; could be information if read by some person; and would become knowledge if they were stored in the person's own 'knowledge base', the information system contained, it is believed, in the brain. Information then seems to be data with a potential for being knowledge. Information must be structured to become knowledge. Data might be badly structured and never become even information. Knowledge seems to imply a usage of the information (unless qualified by a term like 'useless knowledge' which means knowledge of the answer to questions like those in Trivial Pursuit games which are of no real benefit to the person with the knowledge beyond any kind of benefit gained in a competition.

Information standards

Information technology standards for Information are standards necessary for ordering information in such a way that it will be potentially useful. In the UK, the DISC Mission Statement for Information and Documentation Standards (the BSI Committee that deals with information standards) has as its objectives to 'facilitate clear, unambiguous recording and transfer of information in all areas of documentation'. 'Documentation' means here the control of information in any way whether it be publishing, libraries, archives, records management and similar organizations.

Storage and retrieval of data are the two areas where general standards are needed and have been developed. Analysis of information is still an activity which requires human rather than computer attention, though in many scientific areas computers can pre-digest the information. Nevertheless, these are areas specific to a particular subject and general standards have not been developed to cover these areas.

Data storage implies a structure. A user needs a methodology for storing the letters of the alphabet on any computer medium ranging from computer memory to paper tape. The standard character sets of which ASCII is the best known and most widely used example have been developed for this purpose and are covered more fully by Borka Jerman Blazic in 'Character handling and computer communication', elsewhere in this volume.

Certain elements of information (information itself as opposed to its representation) lend themselves to standardization. Time and place come to mind but are notoriously difficult to represent in a standardized way as we shall see later. A user also needs a methodology for storing printed texts on a computer. He needs a methodology for storing indexes in machine-readable form and for displaying them in print. This leads to the subject of library catalogues which are a different kind of index. Here there exist cataloguing codes, rather like legal codes, which tell the librarian what element of the description of a document to include on a catalogue card (or nowadays in a library database) and the form in which to record them, for example, surname before forenames, separated by a comma.

The publishing world also needs standards; not just for phototypesetting or for displaying characters but for the layout of keyboards and for every aspect of book production. The International Organization for Standardization has a Technical Committee on Information and Documentation (TC 46). The term 'Documentation' is used to mean all aspects of published or related unpublished material, including its storage and retrieval. In layman's terms, it is any standard that concerns a library, archive, museum, publisher, or bookseller and does not belong already to any other area. These are terms used in their widest sense so publisher means anyone who produces any kind of document, such as a small company producing documents on a word processor, not only the large commercial publishers.

Computers brought with them the possibility of information technology. In the publishing and library worlds, legal requirements and practical necessity had led standardization even prior to the introduction of computers. The invention of printing brought about a standardization of spelling and of type-faces. Later, most books acquired printed title pages

which included certain details including the name and address of the publisher or printer. This was partly for legal reasons so that someone propagating blasphemy, revolution, or other scurrilous material could be chased. Paper sizes have been standardized for a long time (though admittedly metricized standards are not so old), an example of commercial necessity; and also for commercial reasons the concept of copyright evolved. Already in the 18th century, printers in Dublin were reprinting illegally texts produced in England and selling them in English bookshops at a lower price. Libraries also needed standards and cataloguing codes originated with the Bodleian Library in Oxford in the 17th century and the best known rules before this century were those developed for the British Museum Library by Panizzi in the 19th century. So even before formal standardization activities began with the establishment of the British Standards Institution, there were a number of conventions and standards highly valued by the information world.

In the area covered by ISO TC 46, there are a number of standards which are not really within the ambit of information technology and therefore do not belong to this volume. Conversely, the storage of information in machine-readable form (as opposed to in books) is becoming more closely related with its production which is often by means of computers, so computing standards themselves are becoming more relevant to Documentation. In the past, one went through a book fairly sequentially or in the case of a reference work used a printed index. Now with computerised databanks replacing printed documents in some areas, one can go straight to any word in the text.

Standards for information elements

In the scientific world, many attempts have been made at standardization. The chemical elements all have standard abbreviations which have been accepted for a century. Objects in Natural History have been classified and assigned Latin names in order to standardize international discussion of them. Colours are given standard descriptions, but here we enter a very specialized area and only scientists working in the field of colour are interested in the standards. Weights and measures have also been subject to standardization, and here there is little disagreement. Areas of particular interest are place, time and currency. It is possible to be fairly precise when and where most events occur, but it is not so easy to do this in a standard way on a computer. Computers can usually store or print out the date and time, so it is possible to find the earliest version of a file. However, there is no standard way of doing it so when data are transferred from one system to another there is room for confusion. There are no widely-accepted standards, though there is an international standard ISO 8601-1988: Data Elements and Exchange Formats -- Information Interchange -- Representation of Dates and Times. Taking into account only date, there are pictured below methods of displaying this data element (12 March 1992).

12-3-92 3-12-92 92-3-12 12-3-1992 3-12-1992 1992-3-12
12-03-92 03-12-92 92-03-12 12-03-1992 03-12-1992 1992-03-12
12/3/92 3/12/92 92/3/12 12/3/1992 3/12/1992 1992/3/12
12/03/92 03/12/92 92/03/12 12/03/1992 03/12/1992 1992/03/12
12.3.92 3.12.92 92.3.12 12.3.1992 3.12.1992 1992.3.12
12.03.92 03.12.92 92.03.12 12.03.1992 03.12.1992 1992.03.12
120392 031292 920312 12012992 03121992 19920312

Additionally, the month could be replaced by either the word in any language or an abbreviation of it.

Bearing in mind that any of the above could be confused with 3 December 1992, communication of dates is extremely precarious.

When it comes to standardization of spatial concepts, attempts are made more difficult by the fact that our use of space caries. There are standard abbreviations of American states. Each place can also be identified by a Zipcode or postal code. Geographical coordinates can also be used for identification, whether they be a national system, or based on latitude and longitude. Though they are the most objectively applied, coordinates may not always be what is required, since some systems are analysing only the built environment. Postal codes, in countries where they exist and are specific enough, are perhaps more appropriate there.

Time and time again, information is transferred not directly from one computer to another but by being printed out and then by being rekeyed. Take invoices, for example; they could easily be sent by telecommunications, yet about 95% of invoices are sent by post and treated as above, with manual rekeying of data. Perhaps it is as well, since the human eye can do a huge amount of analysis, avoiding problems that would occur otherwise. There are standard methods of denoting currency, but these are little used. They are in fact unfamiliar and 'unfriendly' but they are precise. They are formed from the international standard country code followed by a 'currency letter' so we have USD for US dollar and GBP for pound sterling. Anything else can be confusing. œ may be used for Italian lira, $ for any number of countries' dollars. But additionally these are often represented differently by the printer from how they are displayed on the screen. Invoices are often received with # instead of œ, and sometimes $ is used instead of œ, reducing the value of the invoice by almost a half! The reason for this is that currency symbols are given different representations in the different national character sets, so if you are transferring a file from one computer to another when each has been set up with

different national character sets, you will have a problem.

Standards for electronic publishing

Information cannot exist in the abstract; it has to be broadcast or published. The book publishing world established its own conventions long ago, but had always done most of its work using hard-metal printing or, more recently, photographic techniques. These standards do not concern us here. The advent of information technology has meant that many more individuals have become involved in the publishing process, and the need for standards to enable them all to intercommunicate has had to be satisfied.

Electronic publishing relies on standards for character sets. Other standards are also involved. International Standard ISO 8879-1986 Information processing : Standard Generalized Markup Language (SGML) includes notes on analysing a document before writing a formal document type definition as well as giving examples from office applications, mathematics, mixed text and graphic applications and languages using non-Latin character sets. There are conventions for inserting codes into text to indicate that certain elements are to be indexed. This is an area where user needs require a lead from the standardization infrastructure. The development of such a convention is required before computer programs can be written interpreting it and producing ultimately eye-readable printed copy products. However, this kind of standard is nowhere in the same class as hardware standards where small changes to a standard can produce expensive manufacturing costs. When contrasted with programming languages, it is clear that the development has started with the involvement of standards committees, so we do not have a situation in which there are rival versions. None of the many relatively small organizations (small by comparison with the giants in the hardware field) involved in the publishing field could ever have individually developed their own standard. Given the situation where resources for standardization in IT are being stretched, it is difficult not to sermonize and say that SGML is an area where it is cost effective to devote public money. The many small organizations which will use the standard will benefit financially overall, though none could ever have committed enough funding to do the job individually, and even collectively it would have been difficult because it is always difficult to point out the benefits of standardization except in the face of the chaos that almost inevitably appears in its absence.

Standards for libraries and bibliographic information systems

The above principle is applicable to many standardization activities in the field of information and documentation. Outside the publishing world, the users of these standards are predominantly public sector, particularly in education, though as many research institutions are being privatized or becoming 'agencies' to use current government terminology, the ratio is changing slightly, though usually at the 'smaller end' since the larger users, like the universities and polytechnics are not becoming private organizations in the true sense. Public sector ethos has tended to colour the tone of the standardization activities. Cooperation rather than competition is the order of the day. This stretches beyond the national into the international arena.

Formats for exchanging data

One of the best known standards in the field of documentation is concerned with data sharing. This is represented by ISO 2709 : Format for bibliographic information interchange on magnetic tape. This standard is used mostly by libraries and organizations (often called secondary services or abstracting and indexing services) which make bibliographies of journal articles and books in a specific subject field. The standard was also recommended in the United Kingdom by BEDIS (the UK Book Trade Electronic Interchange Standards Committee) as the vehicle for bibliographic as opposed to commercial and financial data.

The ISO 2709 standard, formally agreed in 1973, has many failings, but it is a good example of the existence of a mediocre standard being better by far than having no standard at all. Its origin lay in a joint United States Library of Congress / British National Bibliography project dating from 1967 to exchange data in order to build up their own catalogues and union lists. The British National Bibliography was a limited company set up in 1950 and funded by a consortium of libraries to produce and publish a listing of printed materials submitted under the Copyright Act to what was then the British Museum Library. In 1973 it was absorbed into the newly established British Library. The date were to be exchanged on « inch magnetic tape and a format was established known as MARC for Machine Readable Cataloguing [1]. This consisted of a record structure and codes to define different data elements; some of these codes were field identifiers (known as tags) which were held in a record directory and pointed to the text so that tapes could be more efficiently processed; other codes, like the subfield identifiers, were embedded in the text. All this was aimed purely at bibliographic references, not the full text and indeed one of the main aims of the format was to produce catalogue cards in appropriate numbers to include the added headings needed for extra authors, titles and the like. The record structure became a US ANSI standard, but the tags and other identifiers were not accepted by all the members of the ANSI working group. They were included as an appendix though they were an integral part of the application used by the Library of Congress when preparing tapes for other US libraries and for transmission to the British collaborators. In the US other producers of machine-readable bibliographic records like the Chemical Abstracts Service had their own

requirements for field definitions, hence the lack of agreement on the field identifiers. As an aside, it is worth noting that the British National Bibliography immediately diverged in its precise use of field and subfield identifiers and so the field identifiers have never been established as US, British or International standards. Naturally users needed a standard, but it was left to the distributors of tapes to establish these. As mentioned, information is notoriously difficult to standardize, so the leading institutions imposed standards. Although some of their customers would argue that this should have been done more democratically or even with greater technical competence, this reflects rather on the perfectionism inherent in cataloguing and the differences between parties have been relatively trivial. In the US, a committee structure has been established and the former Library of Congress standard (LC MARC) is now called US MARC. This has never happened in Britain where UK MARC [1] is used by UK libraries because the British Library uses it and most records come from them; it is the British Library standard rather than the UK standard though they do consult with organizations like the Library Association and various user groups when they plan to make deep-rooted changes.

Within the MARC standard, there are a number of points at which disagreements can take place. One is in the definition of the data elements. Though MARC does not pretend to incorporate a data element dictionary, it has to assume one as the data elements have to be defined to make transfer meaningful. In the UK, all libraries involved in data exchange use the Anglo-American Cataloguing Code, so this is the source for the 'data element dictionary', albeit implicitly. However, the level of detail which should be incorporated in the records is contestable. Other areas of contention are mechanisms for updating records and methods of linking records. The latter is not of too much concern to libraries as books tend to be the entities at the level of the exchange of data. Anything below that level such as the individual copy is treated purely internally within a system and is of no concern to exchange activities. Relationships between a paperback and a bound copy have been embedded in the unit record. Relationships between one edition and an earlier edition are merely noted as a note in the text.

This does not suit the secondary services so well. This brings us to consider their needs. In the early 1970's they saw the advantages of the MARC format and there were moves to copy the idea basing it on the standard record structure. Few secondary services could agree to the adoption of the MARC format as it was designed for books and periodicals. Some services began to use MARC and others called for a format of their own and looked to an initiative by the International Council of Scientific Unions which was receiving support from Unesco. Though an unofficial standard was established under the auspices of Unesco known as the Reference Manual for Machine-Readable Bibliographic Descriptions [2], it was never adopted as an international or national standard, as far as is known, and eventually, reflecting commercial interests that became paramount in this area in the late 1970s and 1980s many of the original participants withdrew their interest. The activities in database creation became more commercialized and cooperation was replaced by competition. There was much more success with UNIMARC [3] which was established by the International Federation of Library Associations and Institutions (IFLA) as an international interchange format to counter the problem that every country was developing its own national format taking as a precedent the fact that UK MARC had initially diverged from its parent LC MARC. Even so, UNIMARC achieved in its early days more usage as a model for a national format than as a carrier for the exchange of data internationally, though IFLA remained an enthusiastic supporter of the format to serve its original purpose. More recently, Unesco has discontinued further development work on the Reference Manual in favour of a new Common Communication Format (CCF) [4] which has been devised to take into account the requirements of the secondary services but in a way that is compatible with the MARC format. This has seen quite extensive use, particularly in developing countries where the level of precision of MARC and Anglo-American Cataloguing Rules are unaffordable luxuries. Microcomputers have extended the scope of computerised systems to much smaller institutions and the needs of users have become more diverse. Unesco's involvement in the CCF has filled a need created by advances in technology. Indeed, Unesco has developed a software package, known as CDS/ISIS, that encourages the use of standards in the creation of bibliographic databases. It implements the ISO 2709 standard and databases can be created based on the record coding found in MARC formats and the Common Communication Format.

In this field then, the leading players, rather than national and international standards bodies, have led the way, organizations such as the Library of Congress, the British Library and Unesco. There has been little opposition to their work. This is partly because organizations not interested in standardization have ignored it and those that are interested are willing to go along with the work of the leading organizations because it is not a predominantly competitive field.

One final point to note is that ISO 2709 has never been formally adapted to the exchange of data on other media; now that it is becoming increasingly used for exchange between microcomputer systems, this is causing some problems. Implementors have to make some assumptions since the standard is based on half inch magnetic tape and the international standard character sets. Microcomputer users naturally use magnetic diskettes and variants of the IBM PC character set, but these are not taken into account by the standard.

Character sets

This brings us on to the next class of standards. There is actually more to exchanging records than the tape standards

and the record formats. There are the character sets. The best known is the ASCII character set which is essentially a 7-bit character set allowing 128 combinations of bits and 128 different characters some of which are reserved for special purposes so that about 96 may be used for graphic purposes. This can be extended into a 256 byte character set and there are standard mechanisms available for the inclusion of characters from other character sets. Since the information field is international, there is a need for diacritics (also known as accents) on letters of the alphabet. Moreover, the library and information sector was one of the first fields where printouts in upper case characters only were regarded as unacceptable, since they have a history of sophistication in the display of characters. ISO has developed a number of standard character sets for bibliographic use. There is ISO 5426:1983 Extension of the Latin alphabet coded character set for bibliographic information interchange, ISO 5428:1984 Greek alphabet coded character set for bibliographic information interchange, BS 6438:1983 African coded character set for bibliographic information interchange, ISO 5427:1984 Extension of the Cyrillic coded character set for bibliographic information interchange. Incidentally, although the British Standards Institution accepts the extended character set provided for Cyrillic, the United Kingdom has never agreed to the basic set. This is because whereas in the Latin character sets, upper case has lower values than lower case ('A' is 65, 'a' is 97), in the Cyrillic (as originally developed by GOST, the Soviet Union Standards Organization and later adopted as the ISO standard), it is the other way round. The extended Cyrillic set does not raise any such issue. Other countries have accepted the basic set. Additionally, ISO has a character set for Bibliographic control characters (ISO 6630-1986). A coded character set for Mathematics and one for Hebrew are nearing completion.

Industry standards did not catch up with the requirements of users in the information field until the microcomputer entered into widespraed use. The extensive use of microcomputers in word processing meant that accented character sets had to be provided, both for the computers themselves and for printers. The different national versions of the character set developed for the IBM PC is probably the most extensively used, but they are non-standard, because they use character values 128 to 160 for characters when these are reserved for control characters and space.

For many years, the library and publishing field were ahead of other areas in their requirements for characters. Even today, many French systems ignore accented characters, though they are essential for easy reading of French text. Nevertheless, systems are now regarded very mmuch as second class if they cannot manipulate lower case characters and a number of accented characters and other signs. The library world has developed its own solution to these problems, by developing standards specially for a particular need and, in programs developed to use these, calling in character sets by means of escape sequences; but there is now the promise of a new standard which is dealt with elsewhere in this volume (see Borka Jerman-Blazic 'Character handling and computer communication'). Any new methods may prove slow to be accepted in the library and publishing fields which have already made large investments in the existing standards which they have developed themselves.

Data elements

In the information field, as elsewhere, the transfer of data between systems is becoming increasingly common. Standardization is more difficult in this field than elsewhere but certain data elements have been created for the computer environment. Those that are used totally within the library and publishing trade come under the Information and Documentation Committee. Most notable of these are ISBN and ISSN.

ISBN

The ISBN (International Standard Book Number) originated as the Standard Book Number developed by the UK publishing house Whitakers as an 8-digit number with the addition of a check digit. The number consisted of a publisher prefix, and a running number, so that publishers could apply their own ISBN having been issued with a prefix. Most publishers have applied it well, though there has always been some uncertainty as to whether a new impression should get a new number; librarians would prefer a new number to be applied only to new editions since for them a new impression is not a different work. The number was expanded to 9 digits when it was adopted as an international standard with an international maintenance agency based in Germany. The first digit was allocated as a country or in some cases language code, with 0 being for publishers in English speaking countries (Australia, Britain, Canada, Ireland, New Zealand, United States), 2 for French speaking countries including Quebec, 3 for Germany. Numbers beginning with 9 have been allocated to multi-digit country codes and codes for international organizations. There were few attempts to include the ISBN on publications as a bar code because by the time that technology had been developed other products such as baked beans were requiring the same kind of number for automated warehousing and point-of-sale systems. The ISBN has been incorporated into the standard product numbering scheme, by removing the final check digit and applying the scheme's own system of check digit. The ISBN is governed by ISO 2108 and there used to be (in the days of the SBN) an equivalent British Standard, but it is now withdrawn.

ISSN

Following the success of the ISBN, the International Centre of the International Serials Data System (ISDS) developed

the International Standard Serial Number (ISSN). The ISDS was established by Unesco in 1974 (serials is a technical word used by librarians to include not only journals, newspapers, periodicals but also monographic series). It could be asked why there is a need to establish formally standards in this area when there are internationally respected maintenance agencies. The answer probably lies in the fact that Eastern European countries usually had difficulties in adopting practices which were not governed by formally agreed international standards. On the other hand, some national standards bodies have taken a completely different view: the British Standards Institution, never adopted the ISSN standard or the ISBN; it dropped the SBN when it became international on the grounds that there was no need to revalidate a standard established by a competent body.

Under discussion at the moment are ISO standards for an International Standard Technical Report Number and an International Standard Music Number.

Other codes

Codes have also been developed for countries and languages. It is useful in library systems to have a code rather than a country name, not only because it saves space to have a two-digit code but also because official country names might change. There is an international standard ISO 3166 Codes for the representation of names of countries. Some libraries use codes developed by the Library of Congress or their own national library; and others use the motor car country identification codes; few use the international codes, though it is an easy matter to convert to these from another set for international exchange purposes. None of these codes is really intended to be historic, but represent the political situation as at the present time: when the German Democratic Republic was recently absorbed into the German Federal Republic, the code for the former immediately became obsolete. Work is taking place on codes for historical purposes, so that codes will be available for such countries as Prussia and German Democratic Republic.

Although language codes have been developed by ISO ISO 639 Codes for the representation of names of languages, these are not much used, since they have only recently been upgraded from a very sparse list including only the major world languages with bias towards the European languages. Libraries, particularly at the national level, tend to include a very wide selection of languages, and they have been using in their computer databases a set of codes developed by the US Library of Congress. These are also used by Unesco and in many bibliographic systems of the UN. Language codes need a good maintenance agency as, surprisingly, every year a number of languages go into print for the first time and a new code is needed.

Filing order

Information technology has brought with it the need to standardize filing order. In days gone by, the telephone directory, the catalogue card or the bibliography were produced by traditional typesetting, and the human eye and mind were responsible for ordering entries in a catalogue or bibliography. This changed with the introduction of computers. When the ASCII character set was devised, it was developed in such a way as to make filing by the ASCII numerical value a reasonable method for most purposes so long as correction was applied to align lower case with upper case and so ignore case in filing. Libraries, and the documents they produce listing bibliographic works, tend to have more complex requirements than these. ISO Technical Report 8393:1985 is entitled ISO bibliographic filing rules : Exemplification of bibliographic filing principles in a model set of rules, which is based on ISO 7154 Bibliographic filing principles. In the past, numbers in a title in a catalogue were often spelled out, either in the language of the catalogue or the language of the document; now there is a tendency to file them at the beginning of the catalogue before the alphabetical sequence.

Open Systems Interconnection

Open Systems Interconnection (OSI) has had, as might be expected, a profound influence on the standards being developed in Information and Documentation. One facet which has defied standardization, attempted even before OSI came on to the scene, is the specification of a common command language. This refers to codes used to initiate searching on computerized databases, usually though not exclusively in the bibliographic field. The European Community took an interest in this many years ago and a consultant produced a draft 'language' but nothing was ever accepted The problem is that codes need to be specified not only for activities such as search and print but also for the data element. These tend to differ between systems as there is no common data element directory. One system may separate author and editor, another may distinguish between persons as authors and institutions as authors. Even the activities and functions may be system-dependent. The many librarians and workers in the information field who have to keep switching between search languages will be pleased to know that a Search and Retrieval Specification is being developed within the context of OSI. This is going to be absolutely essential if it is going to be possible for computer systems to switch search enquiries from one computer system to another. Commands for interactive text searching are also being developed. The acceptance of a standard data element directory, noted in its absence from the ISO 2709 data structure standard, is in part being resolved. Agreement has been easiest to reach in Interloan applications (ISO 8459-

1). The next section of the data element directory is to cover acquisitions applications. The two parts achieved first are those relating not so much to information retrieval as to the transfer of known items (books, journal issues) between libraries and book suppliers. At the same time, ISO is developing an 'Interlibrary Loan service definition' and an 'Interlibrary loan protocol specification', and the same for search and retrieval, to be the basis for OSI work in the area.

These OSI standards are being formulated through official standardization channels, but -- and it is particularly true of interlibrary loan -- they could equally well have been developed by one or more of the major organizations in the international field acting alone or in partnership but outside the ISO infrastructure, and they would most likely have been as acceptable to the community at large.

Standards for defining the intellectual content of information

Lastly, there are standards for defining the intellectual content of information. These were all developed before computerization and are known as controlled vocabularies, thesauri and classification schemes. Recently, work has gone on to investigate their suitability or otherwise in computerised systems and make suggestions for changes in the light of computerization. Unfortunately, all too often, it is difficult to make changes because the systems were developed in a particular way in order to assist linear searching. Since the computer can make different kinds of searches, much of the basic presumptions of these systems are no longer valid. BSI maintains on behalf of the International Federation for Documentation (not ISO) the English edition of the Universal Decimal Classification (BS 1000), a scheme for classifying knowledge, which has been developed continuously since the 19th century, mostly used to shelve books in libraries. This scheme orders facets of a subject in such a way as to bring the code for the most important one to the fore so that it can be retrieved in an ordered list. It is not very easy to write a computer program to enable it to retrieve the other facets that are embedded in the strings which represent the subject in a coded form. A scheme which was developed today would take into account retrieval by the computer. Thesauri include relationships like broad terms and narrow terms as well as having terms which should be used in preference to others. As regards preferred terms, one thesaurus includes: 'Female manpower: use Women workers' and all thesauri include similar. A narrow term search would automatically retrieve documents which had been indexed as being about 'Town Halls' and 'Art Galleries' when the user made a search for 'Public Buildings'. These relationships can be included automatically in a searching program, but this may result in too much retrieval. These standards do not seem to have yet been influenced by information technology, and do not properly belong in this discussion.

Conclusion

User needs for information technology standards in the information field have been served only partially by the formal standardization channels. Since there are clearly defined leaders in the library field, that has not been a problem, but in the publishing field absence of official standards may have contributed to delays in making use of information technology and may yet reveal incompatibilities in the future.

References

References to standards are made in the text.

1. UK MARC manual. 3rd ed. London, British Library, 1989- (loose-leaf and issued in parts)
2 Martin, M.D. (ed). Reference manual for machine-readable bibliographic descriptions. Paris, Unesco, 1974 (SC.74/WS/20)
3 UNIMARC manual. London, IFLA UBCIM Office, 1988
4 CCF: the Common Communication Format. 2nd ed. Paris, Unesco, 1988

Just like quality control standards for other industrial processes such as manufacturing and customer service, information security standards demonstrate in a methodical and certifiable manner that an organization conforms to industry best practices and procedures. This article offers a review of the worldâ€™s most used information security standards. Discover the world's research. 17+ million members. The standard is explicitly concerned with information security, meaning the security of all forms of information (e.g. computer data, documentation, knowledge and intellectual property) and not just IT/systems and network security. Relationship to ISO/IEC 27001.Â Few professionals would seriously dispute the validity of the control objectives, or, to put that another way, it would be difficult to argue that an organization need not satisfy the stated control objectives in general. However, some control objectives are not applicable in every case and their generic wording is unlikely to reflect the precise requirements of every organization, especially given the very wide range of organizations and industries to which the standard applies. 2 Information Security Framework & Standards A brief introduction to the various Information Security standards and regulations including ISO standards, COBIT, the Sarbanes-Oxley Act, and others.Â 12 The Control Objectives for Information and related Technology (COBIT) â€œa control framework that links IT initiatives to business requirements, organizes IT activities into a generally accepted process model, identifies the major IT resources to be leveraged and defines the management control objectives to be consideredâ€ COBIT 4.1 consists of 7 sections, which are: Executive overview, COBIT framework, Plan and Organize, Acquire.