Standards and Rules for Subject Access

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SUMMARY. Standardization of subject access to bibliographic information systems is an important factor in national and international networking, cooperation, and exchange of bibliographic data. Standards, guidelines, and rules are needed to ensure consistency and quality in the design, development and application of indexing languages to documents and their citations. This paper defines the terms "standards" and "guidelines" as they apply to subject analysis used in library catalogs and bibliographic databases. It identifies and discusses the most important national and international "standards" that influence subject access to bibliographic data. Included are the tools of subject cataloging which have become standards in their own right, as well as formally prepared and approved guidelines. Each "standard" or "guideline" is described in terms of its origins, characteristics, and control and its importance in the design of bibliographic retrieval systems. Emphasis is given to the importance of the relationship between alphabetic and systematic access.

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INTRODUCTION

Providing subject access to documents involves a two-step process—the conceptual analysis of the intellectual content and the...
translation of that analysis into the terminology of the system. In the best of all worlds, standards, codes, and rules for subject analysis should be provided for both steps. However, there are few, if any, formal rules for the conceptual analysis of documents. Derek Langridge has produced a useful discussion of the process of "summarization" in both theoretical and practical terms, F. W. Lancaster refers to the two-step process and several theoreticians have written on the characteristics of "aboutness." Standards, guidelines, and rules that do exist are all related to the tools and systems that make the translation process possible.

The tools of translation are of two basic types—alphabetical descriptor systems (e.g., subject heading lists, and thesauri) and systems for the systematic ordering of documents and files by topics and subtopics (e.g., classification schemes). In the ideal retrieval system, both alphabetical and systematic methods for organization and/or display are used to provide alternative methods of retrieval that complement and supplement each other. For example, the alphabetical descriptors used in most library catalogs function as index terms leading to the location of documents and permitting the browsing of related items on shelves. In contrast, a classified display of bibliographic records in a classified catalog or bibliographic database permits systematic browsing but also must be accompanied by alphabetical indexes. While retrieval using both methods usually produces overlapping results, research has shown that each method results in the location of some documents and/or surrogates not retrieved by the other. That which is scattered by the alphabet is grouped by classification and vice-versa. Moreover, most alphabetical systems have some classificatory elements in them. The degree to which classification is applied depends on the nature of the system.

Standards, guidelines, and rules are needed for the design, construction, application, maintenance and control of these systems. This paper defines the terms "standards" and "guidelines" as they apply to subject analysis systems in general. It identifies and discusses some of the most important national and international "standards" that influence subject access to bibliographic files and databases. Each "standard" or "guideline" is described in terms of its origins, characteristics and control, and its importance in the design of bib-
liographic retrieval systems. Emphasis is given to the importance of the relationship between alphabetic and systematic access.

**STANDARDIZATION DEFINED**

As defined in *The Oxford Dictionary of Current English* a standard is an “object, or quality, or measure serving as a basis or example, or principle, to which others should conform or by which others are judged; [or a] required or specified level of excellence.” In this context, the process of standardization is described as “cause to conform to a standard.” As these definitions suggest, “standardization” can have different meanings in different contexts. As described in the author’s paper on “Standards and Standardization in Subject Analysis Systems: Current Status and Future Directions,” “standards” exist on a continuum which ranges from formal, obligatory rules and regulations, through less regulatory “guidelines and principles” to the common use of tools and instruments. Their origins vary, as do their spheres of influence and degree of application. Some standards are mandated by government or by collective agreement among organizations, while others are applied (or not applied) according to the policies of institutions. Most of the “standards” and rules which pertain to subject analysis, and described here, have either been developed as guidelines, or they are the tools themselves. Some of these guidelines and rules are now mandated, and made obligatory in part, by the requirements of networking, cooperative exchange of bibliographic records and economic constraints. The terms which stand out in the definitions are “quality,” “measure,” “level of excellence,” and “conform[ity].” However, not all accepted standards meet these criteria. In conforming to standards a certain level of quality is accepted. However, this does not necessarily result in excellence.

Are standards, guidelines, and rules for subject analysis systems necessary? The brief answer to this question is “yes,” but there are a number of reasons for this. Subject analysis is one of the most complex and least understood aspects of bibliographical control. In the current environment of global bibliographic information systems, it is essential to provide guidance in the design and development of the tools used in order to achieve, insofar as possible,
inter-system and intra-system consistency and compatibility. Users of systems must be permitted to move with ease from one system to another and it is important to make bibliographic data available as quickly and efficiently as possible at reasonable cost. The major dilemma in the application and use of a common standard is that it may not be the best solution for all needs of all users, in all situations. While standards and rules may be modified, adapted, and supplemented by individual institutions, this may result in adverse effects on networking, cooperation, national, and international exchange of bibliographic data and maintenance. Unfortunately, while it is possible to determine time, effort and money expended in developing and maintaining a system, it is much more difficult to measure accurately the time, effort, and effectiveness of the retrieval process.

**ALPHABETICAL DESCRIPTOR SYSTEMS**

Alphabetical descriptor systems are of two kinds. Those which by nature are precoordinated string systems (e.g., subject headings, PRECIS strings) and those which are primarily single concept systems designed for use in post-coordinate retrieval (e.g., thesauri). While these systems have some common roots, there are also basic distinctions. String systems have their origins in card catalogues and printed indexes, whereas concept based systems, such as thesauri, had their beginnings in the design of automated systems. The information systems for which they were designed are different. For example, subject heading lists are designed on the assumption that access to documents will be supplemented by the use of a classification scheme, whereas thesauri were originally developed to be used in systems where a classification scheme has not been applied to the citations. Hence many thesauri have supplementary codes, hierarchical displays, facet categories and, in some cases, classification schemes attached. These displays are designed to provide users with alternate search aids which, in varying degrees, compensate for the lack of a classified arrangement of documents and/or citations.

While in terms of use, the two types of systems have developed along divergent paths, they are not mutually exclusive. In online
systems the distinction has become somewhat superfluous, since subject headings hardly ever “head” anything any more, and there is no reason why thesaurus descriptors as opposed to subject headings can’t be used in online catalogs. Indeed, in some cases they are. Also, keyword searching of subject headings is, in part, analogous to the searching of concepts. Nevertheless, in practice, in most cases subject headings continue to be used in catalogs, while thesauri are identified with online bibliographic databases. The primary reason for this is historical. Library catalogs have a long history and subject headings are a long established “standard.” Subject headings have continued to be used because of the existence of large catalogs and in spite of the introduction of online catalogs. The result is that not only the systems but the standards, guidelines and rules that apply to the two types of systems have developed separately and a distinction continues to be made.

**STRING SYSTEMS: LCSH**

While there are some experimental string systems, those in common use tend to be products of national libraries and the distribution of cataloging data. Through their wide application in networks and exchange of catalog records these systems themselves have become the “standards.” They are not codes of rules, but they are the embodiment of such rules insofar as they are correctly applied. While beginning with Cutter in 1876, rules and broad principles have existed under which subject heading lists have been developed, there has never been a formal code or “standard” for use in the development of subject heading lists. This does not mean that there have not been efforts to produce such a code. There were at least two early attempts to develop codes of rules for subject access. While recently, there has been a revival of interest and considerable debate on the need for a formal code, it doesn’t appear that a “subject heading code” as such will emerge. Past history suggests that producing a theoretically-based code would not be an easy task and perhaps the time has passed when it would have been regarded as essential. However, there is need for a common set of broad principles which can be applied internationally
and which will accommodate language differences. As described later in this paper, some progress is being made in this direction.

Best known of the national systems is the Library of Congress Subject Headings (LCSH). This subject heading list serves as a national and, to some extent, an international “standard.” It is not a formal code or standard in the legalistic sense; it does not result from formal agreement by a representative group of users; nor is its wide acceptance based on any exceptional quality which it possesses. Rather it is the product of practice and the day-to-day operations of a working library. It is through extensive use that LCSH has become the model or “standard” on which other libraries determine the quality and level of their subject cataloging. The application of LCSH may not result in the quality of subject cataloging which libraries most desire, but it is the quality that they can afford. Its status is further enhanced by the fact that it is used to provide controlled vocabulary for catalog records in several large cataloging databases that are widely available. As well, the list itself is conveniently available in a variety of physical formats—print, microform, MARC tapes, and CD-ROM. The Library of Congress controls the policy and development of LCSH. However, LC welcomes professional input from individuals through direct contact and through the work of the Subject Analysis Committee (SAC) of the American Library Association. Over the past twenty-five or thirty years, SAC has carried out a number of projects which have influenced the development of LCSH considerably.

LCSH traces its origins back to Cutter and is the product of his very broad set of rules. Over many years, these rules have been extended and developed by the Library of Congress and other national libraries, while the nature and characteristics of LCSH have been described and interpreted in the works of David Haykin13 and Lois Mai Chan14 who have provided subject catalogers with valuable aids to understanding its development and application.

LCSH does not stand alone. It is actually only one item in the “family” of tools which together make up the “standard.” Essential support is provided through four additional publications. The most important of these support tools is the Subject Cataloging Manual: Subject Headings (SCM)15 now in its fourth edition. By default it is regarded by many as a “code of rules,” although it is
not a formally organized document. Consisting of two looseleaf volumes it is updated with periodic additions and changes and sets out LC subject heading policy in a series of memoranda primarily intended for LC staff. Many of these contain interpretations and instructions that are also absolutely essential for non-LC subject catalogers. The Manual provides general directions on cataloging policy and practice at LC, describes the nature of subject authority work and explains the current rules for establishing syndetic structure. Essential to the application of LCSH are the extensive lists of free-floating subdivisions, subdivisions for special topics and pattern headings. Since much of this material is not contained in LCSH itself, the SCM is an essential companion to it. Because of its peculiar origins, it is somewhat cumbersome to use, but it has an index and, along with the second member of the “family” of tools, the Cataloging Service Bulletin, it is the definitive statement on LC cataloging policy and on the development and application of LCSH. The Bulletin, published quarterly, announces new policy decisions, explanations, and interpretations on all aspects of LC’s cataloging operations including its subject heading work. Two other important members of the LCSH “family” are the Free-Floating Subdivisions: An Alphabetical Index which brings together alphabetically in one place all of the free-floating subdivisions and locates them in their respective memoranda, and LC Period Subdivisions Under Names of Places.

While global networking and extensive international use of the OCLC database have resulted in world-wide use of LCSH and its relatives, its development in one country, in one language presents problems as a standard for international use. In countries where there are language and cultural differences, adaptation and modification of the terminology is needed for its most effective use. Because of the ethnocentric nature of the list, subject areas such as history, politics and government, literature, native peoples and general culture are not adequately covered for non-American collections. Some indication of the magnitude of the problem can be seen in the findings of a random sample of two hundred terms taken from the 1988 annual index to the British National Bibliography (BNB) and the 11th edition of LCSH also published in 1988. “LEAD” terms from PRECIS strings were compared with main
subject headings from LCSH. Geographic, personal, and corporate names were excluded. Exact matches were found in 36% of the cases. Partial matches were found in 48% of the cases. Of the latter, 41%, or 20% of the total sample, was represented by see references, an indication that the two tools sometimes used different terms for the same subject. For example, “Bibliographic control” was the preferred term in BNB, whereas in LCSH there was a reference from “Bibliographical control” to USE “Bibliography-Methodology.” In 16% of the cases, for terms in BNB no equivalent was found in LCSH. In some instances there were no equivalents, in others terms were different, while in still other cases the same term had completely different meanings in different national contexts. For example, when lecturing on PRECIS, Derek Austin would use “Underground Railway” to refer to the “London Underground.” In a North American context, this same term describes the escape route by which the slaves were shepherded into Canada during the American Civil War. Also, in Canada the preferred term for Eskimos is “Inuit” whereas the 11th edition of LCSH, still preferred “Eskimos,” with references from “Inuit” and “Innuit.” However, some things do change. In its 17th edition, LCSH includes “Inuit” as a Narrower Term to “Eskimos” to be used to describe these people in particular parts of the world.

Depending on the situation, this kind of problem might be handled on a descriptor-by-descriptor basis. However, in many cases a more effective method is the production of supplementary and complementary tools. Examples of such tools are Canadian Subject Headings and A List of Australian Subject Headings, both of which are designed to be companions to LCSH. Language problems are sometimes more difficult to solve. Translation is one solution, but differences in semantics and syntax from one language to another create their own problems. Nevertheless, LCSH has been translated into other languages. One example of this is the Repertoire de vedettes-matière, a French translation of LCSH, which is published by l’Université Laval and applied by the National Library of Canada in its MARC records and the national bibliography Canadiana. Another project is a multi-lingual system produced in Belgium. The NEWWAVE database of the Koninklijke Bibliotheek in Brussels incorporates LCSH in English, French, and Dutch. Other
methods of attacking the problem are the development of completely new subject heading lists based on the "standard model," or the use of a switching language which would act as an intermediary between systems. However, up until now there has been little success in developing switching languages for practical use.

**OTHER STRING SYSTEMS**

A number of other string systems have been developed, for example PRECIS, NEPHIS, and POPSI.\(^1\) All are based on semantics and syntactic relationships and have a logic and elegance not present in LCSH. Developed by Derek Austin at the British Library for use in the indexes of BNB, the Preserved Context Indexing System (PRECIS) is based on a set of procedures (not a list) that, when applied, result in subject strings in which the terms are ordered logically in a one-to-one relationship and are context dependent within a string. Drawn from natural language, the concepts are controlled in a thesaurus of terms which includes a fully developed syndetic structure.

At one time, PRECIS had the potential to become an international standard for subject access to library catalogs. Regrettably this goal is now unlikely ever to be realized. Until recently, maintained by a national library and used to provide subject access in catalog records available in MARC format, PRECIS has also been successfully applied to bibliographic files in some other languages, including French and German. Early in its development it appeared that PRECIS might be in a position to challenge the supremacy of LCSH as the "standard." However, time and effort involved in abandoning one system and implementing another was found to be too expensive. Even the British Library has recently abandoned PRECIS for LCSH. In response to a recommendation from the Subject Analysis Committee of ALA, in late 1977, the Library of Congress conducted a pilot project to assess PRECIS as a replacement for LCSH. It was concluded that the LC subject catalogers could learn the PRECIS system and apply it, but it was felt that the "differences in terminology were great,"\(^2\) that the PRECIS thesaurus developed at the British Library could not be used, and LC would need to create its own thesaurus using American terminolo-
gy. This situation is analogous to the difficulties of using LCSH outside of the U.S. To implement PRECIS, LC would not only have had to train its staff to apply the system, it would have had to build a new subject authority system from the ground up. While it is not impossible to start a new system, the time and effort required comes at considerable cost.

Standards can be a good thing and they have many advantages, but they can also stifle innovation and hinder progress. Nevertheless, while PRECIS is not likely to come into general use, it may still have a future in special types of retrieval systems, particularly media databases. One very successful example of its continuing application is the index to the National Film Board of Canada Film Catalogue where PRECIS strings serve admirably as a kind of "precis" of each film title. Frequently, film titles are not very expressive of the subject content of the film, whereas the presence of the PRECIS strings in the index, permits catalog users to make preliminary selections of films by subject from the index.

**INTERNATIONAL GUIDELINES FOR STRING SYSTEMS**

For historical reasons and peculiarities of language, there are still many countries which have their own subject analysis systems and rules. However, in a climate of international exchange of bibliographic data, there is a need for common principles, guidelines, and rules upon which national systems can be based. Experience has shown that this is not easy to achieve. Many variations exist across national and local systems world-wide and technical terms used by subject catalogers across nations and across languages are often defined differently. However, recently, the Section on Classification and Indexing of the International Federation of Library Associations and Institutions (IFLA) has been working on two projects that will create guidelines and principles for international use in compiling subject heading lists and carrying out subject authority work.

The recently published *Guidelines for Subject Authority and Reference Entries* prepared by a Working Group of the Section is a major step in the direction of an international standard. The purpose of these guidelines is to provide libraries and information centers with a broad set of rules that may be applied to a wide variety of
subject descriptor systems and that would permit ease in the international exchange of subject cataloging data. They attempt to be international in scope and contain a spectrum of examples from a number of countries and languages. Their application is not obligatory, but they were drawn up by a representative international committee and scrutinized for suggested changes in a world-wide review prior to their approval. Because of extensive variations in subject heading practices and language requirements across the world, the approach taken in these guidelines is necessarily very broad. However there are many explicit examples gathered from a range of sources in various countries and languages. Only time will determine whether these Guidelines are accepted as a "standard," but they represent a giant step in the right direction.

Another document which will be forthcoming in the near future and which is international in scope, is "Principles Underlying Subject Heading Languages." It will also be the product of a Working Group of IFLA's Section on Classification and Indexing. This document will contain the background, definitions, and principles themselves and will have illustrations from rules for subject heading systems in Germany (Regeln für den Schlagwortkatalog), Iran (Rules and Regulations Concerning Subject Headings), Portugal (SIPOR-base-Sistema de Indexação em Português: Manual), and the US (Subject Cataloging Manual) plus examples from Canadian Subject Headings. The Working Group hopes that the final version will also include excerpts from rules used in Brazil, Croatia, France, the Netherlands, Norway, Poland, Russia, Spain, and the UK. A revised and expanded draft of these "Principles" was discussed at the IFLA Conference in Istanbul, Turkey, in August 1995. Soon after, the draft is expected to be sent out for world-wide review. This document should serve as a companion volume to the previously published Guidelines. Together they should provide a truly international basis for improved compatibility for the international exchange of subject analysis data.

**CONCEPT SYSTEMS: THESAURUS STANDARDS**

In the standards and guidelines, thesaurus descriptors are described as "concepts." However, the word "concept" has never
been satisfactorily defined in terms of controlled vocabularies. Some years ago Loll Rolling\textsuperscript{26} illustrated the notion of "concept" as the second stage of a continuum of descriptor types, moving from simple to complex—from uniterms (or keywords) through uniconcepts to subject headings. The end result was some descriptors that could be differentiated in this manner, while other descriptors that were uniterms also qualified as uniconcepts as well as subject headings. For example, the descriptor "petroleum" met the criteria for all three categories. In her paper on "Indexical Contexts,"\textsuperscript{27} Elaine Svenonius describes concepts as basic "units of meaning," that is units of thought, or mental constructs. Lancaster\textsuperscript{28} discusses the problem and uses the term "concept headings" in referring to thesaurus terms, and the ISO 2788 Guidelines for the Establishment and Development of Monolingual Thesauri\textsuperscript{29} defines an indexing term as "the representation of a concept" but does not define "concept" itself.

In spite of this confusion, thesauri are the most obvious examples of what might be called "concept systems," as opposed to "string systems." An examination of such tools suggests that the "true" concept is an elusive thing, correctly or incorrectly defined by individual thesaurus compilers in their own terms. It is difficult to generalize on the nature of "concepts," since the need for compound versus factored terms seems to vary greatly from one discipline or one subject to another. While thesaurus guidelines endeavor to explain "concepts" through examples, the most visible criteria for determining whether a controlled vocabulary is a thesaurus or not are the non-use of precoordinated subdivisions, the use of the symbols BT, NT and RT, and the inclusion of hierarchical, rotated, and other types of supplementary displays. Today the term "thesaurus" is used very loosely. Thus the presence of these criteria does not necessarily mean that a particular tool is a thesaurus. In the strict sense of the guidelines, some descriptor lists are not thesauri even though they describe themselves as such. The nature and structure of controlled vocabularies is changing over time. Because of the effects of changing technologies, by the 21st century the term "thesaurus" may be legitimately applied to vocabularies and terminologies that are very different from those currently being developed, or new terminology may emerge to describe such vocabularies.
In contrast with the rules for subject headings, the historical development of thesaurus standards, guidelines and rules has been much more orderly and precise. From a very early stage the compilation of thesauri was accompanied by the parallel development of guidelines for their construction. While these guidelines are not obligatory, they are set out as formal rules and development has been gradual and cumulative. As illustrated by F. W. Lancaster in his arrowgraph of the “evolution of thesaurus standards” guidelines for thesaurus construction have their origins in both alphabetical subject indexing (Cutter’s Rules) and bibliographic classification (Ranganathan’s alphabetico-synthetic classification).

From the alphabetical indexing perspective, four early thesauri were constructed using simple terms or concepts and syndetic structure analogous to the structure used in subject heading lists. The construction of these thesauri led to the development of the COSATI guidelines, from which emerged ANSI Z39.19 (1974) and the Unesco Guidelines for the Establishment and Development of Monolingual Scientific and Technical Thesauri (1970). As new thesauri were developed and the need for guidelines increased, the Unesco guidelines spawned French and German guidelines as well as the first edition of ISO 2788. All were the products of standards organizations as opposed to library associations and institutions.

From the perspective of classification, Ranganathan’s influence manifested itself through two lines of development—one hand through the work of the Classification Research Group (CRG) in the United Kingdom leading to the development of PRECIS, and on the other hand through the application of faceted classification (by a member of the CRG) in the construction of Thesaurofacet. The latter was one of the first thesauri to integrate an alphabetical thesaurus with a fully developed faceted classification system. Since the COSATI guidelines were also used in the compilation of Thesaurofacet, this work represents a completed link between the guidelines for alphabetical thesauri and the application of the principles of faceted classification. Ultimately, all of these developments, PRECIS, Thesaurofacet, and ISO 2788 (1974) converged in the British standard BS 5723 which in turn spawned a new edition of the Unesco guidelines and the second edition of ISO 2788. The
ANSI Z39.19 guidelines were not part of this merger, but the compilers of ANSI Z39.19 (1993) have stated clearly that they drew heavily on the previous ANSI guidelines and on ISO 2788. While initially, much effort went into the development of guidelines, recent activity has focused on the consolidation of the status quo. Little new ground has been broken, although there is still room for clarification and perhaps for revisiting the guidelines in the light of recent technological developments. The existing ISO 2788 guidelines, now approximately 10 years old, were developed at a time when most thesauri were in printed form. More and more thesauri are being created and used online. ANSI Z39.19 (1993) addresses this change in part but more intensive consideration of this factor may be needed. Certainly more attention needs to be given to role of faceted classification in the structuring of thesauri and ISO 2788 should be re-examined in the light of recent technological changes and future requirements.

In spite of the well controlled historical development of thesaurus guidelines, there is some doubt as to how much direct impact they have on actual thesaurus construction. In 1990 in his paper on "The Standards Jungle," Alan Gilchrist stated that "virtually the only recommendation in ISO 2788 which has become "standard" is the use of the symbols BT, NT, RT, etc., to denote Broader Term, Narrower Term and Related Term." A brief examination of a sample of published thesauri suggests that this may very well be the case. There is a wide variation in the nature and quality of thesauri in both printed and electronic form. Why should this be so? A major factor is the lack of standardization of features across databases. Moreover, these databases are not exchanging data with each other, so for the vendors the need to standardize is not a compelling concern. However, there is a high level of frustration among information professionals, who are users of bibliographic databases and who are concerned about compatibility and convertibility of indexing languages, particularly in disciplines such as the social sciences and subject areas such as medicine. Another reason for the lack of rigor in the application of thesaurus guidelines could be the focus of most thesauri on specific disciplines and subject fields, where the issue of standards is sometimes local, rather than national or international. Unfortunately, work with databases and controlled
vocabularies is not confined to those who have education and training in the information professions. Inevitably, that there are database vendors and systems designers who are unaware of even the existence of guidelines. As the information highway extends itself and the demand for global access to databases increases, information professionals have a responsibility to take the initiative in standardization issues in order to bring order out of what could otherwise become chaos.

CLASSIFICATION SYSTEMS AS STANDARDS

The facility for systematic browsing of documents and surrogates is an essential component of most information systems. Among the various methods for providing this facility, are the application of standard classification schemes and the use of various other kinds classificatory structure, such as faceting, clustering, and categorization, in the organization of documents or their surrogates on the basis of subject content or other appropriate characteristics. There are no formally written standards or guidelines for classification systems, although there are definitely stated principles. For practical purposes, the major general classification systems are themselves standards. Other types of classificatory grouping in information systems are more apt to be individual in nature. Three general classification systems warrant consideration as international "standards" in their own right. These are the Dewey Decimal Classification (DDC), the Library of Congress Classification (LCC), and the Universal Decimal Classification (UDC).

Of these, DDC best fits the requirements of an international standard. While it had its origins in the work of one individual, Melvil Dewey, it has developed into a truly international tool. During much of its history it has been controlled and developed under the guidance of an internationally representative Editorial Policy Committee. It is well supported financially and is revised and updated on a continuing basis. It has been translated into many languages and uses a notational system which is language independent. Also DDC is centrally applied to catalog records which are internationally accessible. The schedules have been published in both abridged and full form. A "Manual" of instruction is integrated into
both editions and the full edition is available in both printed and electronic form. However, as an international “standard” DDC does have weaknesses. In spite of intensive efforts to revise and improve it, it still exhibits some cultural biases and some 19th century approaches to the organization of knowledge. While DDC may be a less than perfect standard, it is an important tool which can be expected to remain an international standard well into the future.

In contrast to DDC, LCC is the product of one library and is controlled and updated by that library. It is, at present, available only in English. Its notation is also language dependent and its content and development reflects the needs of one library, albeit a large library with a broad coverage of topics. Thus it has a built in bias not only to one language, but also to one culture and one collection. Like DDC, it is assured of having strong financial support and there is a policy of continuous revision. It has achieved status as a standard in North America and English speaking countries elsewhere in the world, mainly because of its application to catalog records which are widely available in both printed and machine-readable form. However, like its companion LCSH, it has its limitations for countries other than the United States, particularly in areas of history, politics, and literature. In some cases solutions to this problem have been found. National schedules have been developed to handle these deficiencies. For non-English speaking countries LCC presents even greater problems, not only because of the non-existence of schedules in other languages, but also because of the notation. The mixed notation is a problem where non-Roman alphabets are the norm and the extensive use of Cutter numbers as an integral part of the schedules is a limiting factor in all countries where the predominant language is not English. Yet it has an international future as a result of its availability on records contained in the OCLC database and on USMARC tapes which include many records for documents in languages other than English. While, the schedules are not yet available to users in machine-readable form, the Library of Congress staff is working to eliminate this limitation.

UDC is somewhat more problematic as a “standard.” While its origin is the 5th edition of DDC, the two systems have developed over their long history along very different paths. While UDC is published by some standards organizations and is used by a number
of national bibliographies, mostly in non-English speaking countries, in a paper on the "Present Role and Future Policy for UDC as a Standard for Subject Control," I. C. McIlwaine states that "it cannot truly be described as a standard."^41

Nevertheless, UDC does have some of the qualities important to a classification system which is a "standard." It has some 40,000 users across the world, a notation which is language independent and it has been translated into many languages. It is also available in both printed and machine-readable form (in CDS-ISIS). Historically, there were optimistic signs that UDC might have an important role to play in computerized information retrieval. It was the first of the general classification systems to be investigated in experimental information retrieval using classification systems, and serious thought was given to the possible use of UDC as a switching language between one classification system and another. Neither of these ideas bore fruit for a number of reasons. For much of its existence, UDC's financial support has been uncertain. UDC does not have the advantage of wide application to readily available catalog records which LCC and DDC have. Also, in the past it has not had the advantage of consistent continuous revision under the guidance of a strong representative editorial board. The original mode of revision was through revision committees of users and an editor who responded to committees' suggestions. While democratic, this process of revision is sporadic at best and results in ad hoc development of the schedules.

Recent changes in the management of UDC show promise for the future. A Consortium of FID and 5 major publishers is now managing UDC. Some progress has been made toward a more stable financial situation, but there is still much to be done. A new Editor-in-Chief has been appointed with a mandate to carry out an organized program of revision with the support and advice of an Advisory Board. A new Guide to the Use of UDC^42 has been prepared. Also publication is being streamlined. Efforts to try to produce and maintain three levels of schedules—full, medium and abridged—have been abandoned and plans for the future are to publish one "standard" edition of approximately 60,000 terms, roughly equivalent in size to the recently published English Medium Edition. This "standard" edition is to be published in English and it is assumed that it
will be the basis for all other editions in all languages. These decisions could do much to expedite revision and updating of the system and attract more users, particularly in non-English speaking countries.

However, this may not be enough to raise the status of UDC as a "standard." An important question which must be addressed is: "What kind of bibliographic classification is most likely to be needed in the future?" There is no easy answer to this question, but it warrants serious thought. Could UDC be converted or restructured into a system which would be more effective in online systems? Currently an experiment is underway which will convert one UDC class (61 Medicine) into a faceted classification with a thesaurus to serve as the index. While this project will not provide a definitive answer to the question about a more effective classification for online systems, it is one small step in that direction. There is an assumption here that a faceted classification linked with a thesaurus might be more useful as a search aid in online bibliographic systems than the traditional systems. Only time and testing will determine whether this is so.

**RELATED STANDARDS**

The standards and rules discussed here are those most directly related to the subject analysis of textual content, its analysis and representation. However, the provision of subject access, specifically in online catalogs is also controlled by the MARC formats for bibliographic records, subject authority records, classification data, and shelflisting. While they are part of the MARC "family" and discussed elsewhere, these formats control the kind of subject analysis data which may be included in catalog records and the ways in which the data can be manipulated. As the production of full-text systems progresses, another aspect of standardization with implications for subject access is text-encoding standards.

**CONCLUSION**

Standards, guidelines, and rules for subject access have developed along two distinct paths. On the one hand indexing languages
for use as subject analysis tools have been accepted by default as "standards," while on the other hand formal "guidelines" have been drawn up. Clearly, it is the application of the tools which has resulted in standardization of subject access, while the carefully stated guidelines are applied (or not applied) on an individual basis. It is apparent that the existence of standards or guidelines does not necessarily lead to standardization. There must be some compelling reason to apply standards if that goal is to be achieved. In terms of subject access, this translates into networking, cooperation and exchange of bibliographic data nationally and internationally. It also follows from economic constraints and ease of availability. The result is "conformity." Although it is difficult to believe that this kind of standardization leads to either "quality" or "excellence," these remain desirable goals for which to strive. As access to information becomes more global, standards and their application will become increasingly important and need to be rethought. Among concerns which should be addressed are compatibility and convertibility of indexing languages.

NOTES


19. These “findings” have been excerpted from the author’s paper on “Subject Cataloguing and LCSH” published in *Standards for the International Exchange of Bibliographic Information: Papers Presented at a Course Held at the School of Library, Archive and Information Studies, University College London, 3-18 August 1990*. Edited by I.C. Mellwaine (London: Library Association, 1991), pp. 143-44. While the study was not replicated on later data for this present paper, there is no reason to believe that the percentages would have altered significantly in the interim.


25. International Federation of Library Associations and Institutions. Division of Bibliographic Control. Section on Classification and Indexing. Working Group


41. I.C. McIlwaine, "UDC as a Standard for Subject Control," in *Standards for the International Exchange of Bibliographic Information: Papers Presented at a Course Held at the School of Library, Archive and Information Studies, Univer-