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Subject Cataloguing of Information Resources in Libraries: Review of Theory and Practical Techniques

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I. Introduction

A catalogue is an organized set of bibliographic records that represents the holdings of a particular collection and/or resources accessible in a particular location. It may be arranged by classification notation, alphabetically by names, titles, or subjects and in various other ways. A collection may consist of any of several types of materials – books, periodicals, maps, coins, sound recordings, paintings, musical scores, to name just a few (Joudrey 2017). Traditionally, the collection represented by a catalogue has been located in one place or at vast in different parts of the same institution. Increasingly, however, catalogues may represent the holdings of more than one library, as libraries form consortia or otherwise link their catalogues for the purposes of interlibrary sharing. Such catalogues are sometimes called union catalogues.

Cataloguing is the process through which catalogues are prepared. This process usually begins with descriptive cataloguing, including access point choice and creation, and then moves into subject analysis. Additionally, authority control and the encoding of the metadata are mixed into the process.

Subject cataloguing is that phase of cataloguing which is concerned with the assignment of subject (s) to an item in a collection. It involves all the professional techniques and processes of identifying the subject matter or content of a work and choosing a subject and acceptable word or item from a heading list or thesaurus to describe the subject. According to ALA Glossary of Library and Information Science (1983), a subject heading "is an access point to a bibliographic record, consisting of words or phrases which designate the subject of the work(s) contained in the bibliographic item". Subject assignment could be subject headings or subject numbers. Subject cataloguing also includes the linking of related subjects in the catalogue.

In this chapter, the authors discuss subject cataloguing, subject heading, subject analysis and subject entry. Also tools for subject cataloguing which include subject heading lists and classification schemes are discussed.

Understanding Subject Cataloguing

The purpose of subject cataloguing is to list under one uniform word or phrase, all materials on a given subject that a library has in its collection. The idea about subject cataloguing is that users of fairly large libraries such as academic and research libraries usually do not have the author or title of a document in mind. Rather, they are interested in documents on particular area in which a user is researching, studying or writing (Aina, 2004). Consequently, cataloguers provide subject headings for every document catalogued in that particular library to enable users have access to books on required subjects.

Subject Cataloguing is a term that embraces both subject heading assignment and classification which has continued to play increasingly significant role in the information retrieval world. As Browman (2003) notes, subject cataloguing comprises two main aspects: classification and subject heading. According to him, there are several general classification schemes and numerous specialized ones in use, and various different systems of subject headings. Most libraries have some form of classified shelf-arrangement and many use subject headings. According to the ALA *Glossary of Library and Information Science* (1983), subject cataloging involves subject

analysis of the resource and providing corresponding subject headings from a controlled vocabulary or subject heading list, such as *Library of Congress Subject Headings* (LCSH), *Medical Subject Headings* (MeSH) and assignment of classification numbers using schemes such as *Library of Congress Classification* (LCC) or *Dewey Decimal Classification* (DDC).

Classification or Library Classification is the process of arranging, grouping, coding, and organizing books and other library materials on shelves or entries of a catalog, bibliography, and index according to their subject in a systematic, logical, and helpful order by way of assigning them call numbers using a library classification system, so that users can find them as quickly and easily as possible. Use of classification enables library users to browse on shelves to find its materials, determines the place of a book and the shelf, and also collocates additional items on the same or related subjects. Classification also enables the library users to find out what documents the library has on a certain subject. The cataloger assigns a classification, or call number, in correlation with the subject headings.

Subject Heading

Subject Heading is defined as the most specific word or group of words that captures the essence of the subject or one of the subjects of a book or other library material (e.g. serial, sound recording, moving image, cartographic material, manuscript, computer file, e-resource etc.) which is selected from a subject heading list containing the preferred subject access terms (controlled vocabulary) and assigned as an added entry in the bibliographic record which works as an access point and enables the work to be searched and retrieved by subject from the library catalogue database. Subject headings are also used in a bibliography and index. The controlled vocabulary identifies synonyms terms and selects one preferred term among them to be used as the subject heading. For homonyms, it explicitly identifies the multiple concepts expressed by that word or phrase. In short, vocabulary control helps in overcoming problems that occur due to the natural language of the document's subject. Hence, if vocabulary control is not exercised different indexers or the same indexer might use different terms for the same concept on different occasions for indexing the documents dealing with the same subject and also use a different set of terms for representing the same subject at the time of searching. This, in turn, would result in 'mis-match' and thus affect information retrieval. Cross-references are used with headings to direct the user from terms not used as headings to the term that is used, and from broader and related topics to the one chosen to represent a given subject. A subject heading may be subdivided by the addition of form subdivisions, geographical subdivisions, chronological subdivisions, and topical subdivisions to add greater specificity or add a parenthetical qualifier to add semantic clarification. Two popular subject heading lists are Library of Congress Subject Headings (LCSH) and Sears List of Subject Headings (*ALA Glossary of Library and Information Science*,1983).

Subject Heading List

Subject Heading List is the printed or published list of subject headings which may be produced from the subject authority file maintained by an organization or individual. Subject heading list contain the preferred subject access terms (controlled vocabulary) that are assigned as an added entry in the bibliographic record which works as an access point and enables the work to be searched and retrieved by subject from the library catalog database. The controlled vocabulary identifies synonyms terms and selects one preferred term among them to be used as subject heading. For homonyms, it explicitly identifies the multiple concepts expressed by that word or phrase. In short, vocabulary control helps in overcoming problems that occur due to natural language of the document's subject. Hence, if vocabulary control is not exercised different indexers or the same indexer might use different terms for the same concept on different occasions for indexing the documents dealing with the same subject and also use a different set of terms for representing the same subject at the time of searching. This, in turn, would result in 'mis-match' and thus affect information retrieval. Cross-references are used with headings to direct the user from terms not used as headings to the term that is used, and from broader and related topics to the one chosen to represent a given subject.

Subject Analysis

The subject analysis process begins with determining the *aboutness* of the work that is, what subject concepts are covered by the intellectual or artistic content of a work, and in the case of some creative works, the form or genre represented by the resource. Once these have been determined, the concepts are then translated into one or more forms of controlled vocabulary. Controlled vocabularies can take a verbal approach (i.e., subject headings or descriptors from a thesaurus) or a notational approach (i.e., symbols from a classification scheme) to subject representation. When taking a verbal approach, as many subject headings as are appropriate are chosen from a standard list to represent the topics of the work. Again, an authority file must be consulted if the works are to be properly collected into the catalogue with other works covering the same or related subject concepts. Verbal subject representation may take the form of single terms assigned individually to a work to

represent a single concept, or it may take the form of strings of terms to represent multiple facets of a topic, if the controlled vocabulary allows this type of heading construction (Joudrey, 2018).

When using the notational approach, symbols from the classification scheme used by the library are assigned to the resource. Traditionally in the United States, classification serves both as a means for bringing an item in close proximity with other like items in the catalogue and, in the case of tangible resources, as the first element of the call number, a device used to identify and locate a particular item on library shelves. The cataloguer, therefore, must choose the one best place in the classification scheme for the item. In other parts of the world, however, or in nontraditional collections, more than one classification notation may be assigned to a resource to represent multiple topics or multiple aspects of subjects found in the content. These multiple classification numbers may be used as searchable access points in the catalogue, but with only one being chosen to represent the shelf location of the item.

Subject Entry

A subject catalogue contains entries arranged according to the subjects of the materials. The entries are equally arranged alphabetically and aimed at satisfying the approach of the reader from any subject dealt with in the item.

Tools for Subject Cataloguing

Adding subject headings, selected from a controlled vocabulary, to a catalogue record allows the catalogue user to retrieve all items on a given subject in a consistent manner. According to ALA (2019) there are two controlled vocabularies commonly used in libraries:

Library of Congress Subject Headings (LCSH) were developed and are maintained by the U.S. Library of Congress, initially for the collections of the Library. LCSH, as a controlled vocabulary used for indexing, cataloging, and searching for bibliographic records in library catalogs and electronic databases, has become a *de facto* standard for libraries who use cataloging records disseminated by the Library of Congress, or who catalog to the standards set collaboratively by the Library of Congress and the library community. LCSH is updated daily in Classification Web.

Sears List of Subject Headings (SLSH), first published by Minnie Earl Sears in 1923, has served as a standard authority list for subject cataloging in small and medium-sized libraries, delivering a basic list of essential headings, together with patterns and examples to guide the cataloger in creating further headings as needed. It is available as a print publication and an online database.

Features of Sears List of Subject Headings

Although the Sears list is not an abridgment of LSCH, it is similar in principle, format, and structure. It is a list of preferred terms and lead-in terms, with generous cross-references. Like LCSH, it is a partially enumerative system, with *key headings* analogous to LCSH pattern headings, and with considerable freedom (following guidelines) given to its cataloguers to use terms not in the list. An interesting feature of Sears is that, its headings are followed by classification numbers taken from the Abridged Dewey Decimal Classification. There have been many editions of *List of Subject Headings for Small Libraries* since the first appear in 1923, the most recent being the nineteenth, in 2007, under the title *Sears List of Subject Headings* (Miller and Bristow, 2007).

Examples based on Library of Congress Subject Headings (LCSH) following principles of assigning subject headings as described in Subject Headings Manual of Library of Congress:
English literature—20th century—History and criticism.
Construction industry—United States.
India—History—Autonomy and independence movements.
Piano music (Jazz)—France—History.
Aging—Egypt—Psychological aspects.

Other Controlled Vocabularies in use with library materials:

Faceted Application of Subject Terminology (FAST) is an adaptation of the Library of Congress Subject Headings with a simplified syntax. The purpose of adapting the LCSH with a simplified syntax to create FAST is to retain the very rich vocabulary of LCSH while making the schema easier to understand, control, apply, and use. The schema maintains upward compatibility with LCSH, and any valid set of LC subject headings can be converted to FAST headings.

Faceted Application of Subject Terminology (FAST) Schema

The FAST system consists of separate elements. These elements comprise eight facts: seven subject facets and a form/genre facet. Headings in the subject facets reflect what the work being catalogued or indexed is about; form/genre headings, on the other hand, represent what the work is, for example, "dictionary". Subject facets include Topic, Place, Time, Person, Corporate body, Event, and Title of works. All FAST headings are fully established and appear in the FAST authority system as such, even those which in LCSH were constructed using pattern headings or free-floating subdivisions. In other words, FAST is an enumerated system with very few decisions required of those who use it.

FAST headings look very much like those in LCSH, the salient difference being in subdivisions. In FAST, all the terms in a subject string must come from the same facet. The following example shows the difference between LCSH and FAST subject headings for a work on alcohol and aging.

LC Subject Headings	**FAST Headings**
Older people – Alcohol use – United States	**Alcoholism** (Topic facet)
Alcoholism – United States	**Older people – Alcohol use** (Topic/subdivision facet)
Aging – United States – Psychological aspects	**Aging – Psychological aspects** (Topic/subdivision facet)
Aging – United States	**United States** (Place facet)

Figure 1: Difference between LCSH and FAST Subject Headings on Alcohol and Aging
(Table format – Authors)

Medical Subject Heading (MeSH)

MeSH is an example of a specialized controlled vocabulary. MeSH is the system designed and used by the NLM for assigning indexing terms to books and journals articles in the biomedical sciences. It has gained considerable acceptance outside of NLM and is now widely used by the abstracting and indexing services that sere the field. MeSH now exists in an online version accessible on the National Library for Medicine and is now widely used by biomedical and health sciences libraries and by the abstracting and indexing services that serve the field. MeSH now exists in an online version, accessible on the NLM Website and available for downloading in several data formats (including XML, ASCII MeSH, and MeSH/MARC). (Medical Subject Headings, 2003)

Structure and Application of MeSH

The most striking feature of MeSH is its categorized system to descriptors (called "tree structures") that show hierarchical relationships among terms. Tree Structures consists of 15 categories in which each heading is laced in relationship to other headings that represent similar areas and concepts. A system of "tree numbers" (each consisting of a capital letter followed by one or more digits) reflects the hierarchies. Each category is subdivided into one or more subcategories, with headings arranged hierarchically in each, and each heading is accompanied by the full tree number giving the location of the heading in the "tree". If a topic represented by a given heading belongs to more than one subcategory, that heading may appear in several places in the tree structures. When a concept appears in more than one hierarchy, it is assigned multiple tree numbers. The tree structures provided a classificatory approach to medical subjects, (Cutter 1904) manifesting hierarchical principles and providing a logical basis for the cross-references. In online retrieval, the tree numbers, also called descriptor codes, can be used to search for related subjects. MeSH contains the following types of terms: Descriptors (main headings), Qualifiers Publications Types, Geographies, and References. Descriptors, also called main headings, represent main topics, usually in the form of single words or phrases, the latter sometimes inverted.

Understanding Classification Theory

Classification, broadly defined, is the process of organization knowledge into some systematic order. It has been considered the most fundamental activity of the human mind. The essential act of classification is the multistage process of deciding on a property or characteristic of interest, distinguishing things or objects that possess that property from those that lack it, and grouping things or objects that share a common property or characteristic into a class. Other essential aspects of classification are establishing relationships among classes and making distinctions within classes to arrive at broader and finer divisions. Those who devise and use library classification schemes do much the same thing. The classification of library materials can thus be seen as a special application of a much more general human intellectual activity.

One of the approaches of modern classification theory, instead of cleaving to strict hierarchical principles, is to start with specifics, identifying the basic components of subjects and listing under each discipline, or main class, the elements or aspects that are topically important within that class. The same operation can be thought of as the analysis (or breaking up) of a subject into its component parts and the synthesis (or reassembling) of those parts as required for the purpose at hand. Most major subjects or disciplines have their own class-specific facets: for instance, a discipline such as Education might have a facet for Persons Taught, a facet for Subjects Taught, a facet for Educators, a facet for methods of Instruction, a facet for Educational Institutions, and so on. Svenonius (2000) defines "facets" in part in the following terms: "Facets are groupings of terms obtained by the first division of a subject discipline into homogeneous categories. To characterize a facet as semantically cohesive is to say that the terms in it have similar referents. For instance, terms in one facet may all refer to processes, like mining, building, or cataloguing; in another they may refer to concrete objects, like coal, house or books".

In addition, recurring or common facets, such as form division, geographical divisions, and chronological divisions, are usually listed separately for application to all classes. In cataloguing with such a scheme, the act of classification essentially consists of identifying appropriate component facets and combining them according to a predetermined *citation formula*. Such a classification is called a faceted classification. An example is Ranganathan's *Colon Classification*, primarily important today because it brought the idea of faceted classification to the attention of the Western world.

Library Classification

Traditionally, library classification has involved labeling materials in a collection according to the provisions of an inclusive, usually hierarchically arranged, grouping scheme. The labels, called notation, usually in the form of numerals or letters or a combination of both, serve a dual function: to range items in a logical order on library shelves, and to provide a systematic display of bibliographic entries in printed catalogues. Bibliographies, and indexes. In any grouping operation, the basis for grouping must be determined. In library classification, it is subject. In biological taxonomy, on the other hand, it is ontogeny, the development of life forms.

The two major library-oriented classification systems in the United States today, DDC and LCC, are general in scope. Classification according to such hierarchical principles, with biological taxonomy as the prevailing model, was in a particularly active stage of development during the latter part of the nineteenth century. DDC and LCC both originated at that time and still, to an increasingly limited degree, reflect the general intellectual climate of that era. Each is conscientious about undertaking revisions and issuing updates.

Design and Application Principles of Library Classifications

The parallel between classification and controlled vocabulary as avenues to effective information retrieval continues to hold both for the design of classification systems and for suing them to assign class numbers to physical items or to organize lists of bibliographic items. The following list of overview considerations are presented by Hodges (2018).

Scope: The system should cover the range of material of interest to the persons expected to use the collections for which the classification scheme is being built.

Library warrant: The system should accommodate new concepts showing up in material being catalogued, and should, in general, offer provisions (classification positions) that mirror the information environment in which the system is used.

Terminology: Wording within the system should be uniform, unique, current in respect to subject matter covered, and in line with the usage of those for whom the scheme was developed.

User aids: Explanatory notes, cross-references, and indexes should be generously provided, with end-users as well as cataloguers in mind.

Application guidelines for subject analysis: All possible aids, some in addition to those just noted, should be available to cataloguers, to help them determine the best fit between the subject matter of the piece in hand and the provisions of the classification scheme being used.

Revision: Constant revision is needed, to keep the scheme as hospitable, as responsive, and as up-to-date as possible.

Classification Schemes

Modern library classification employs philosophy of classification as it organizes knowledge in style registering, evaluating and classifying thoughts, ideas and concepts representing the whole field of human learning. These along with the format, rules and principles of each system are published for practical applications by libraries and are known as classification scheme. Library classification schemes are logical arrangements of subjects plus a system of symbols representing those subjects. Each classification scheme organizes the entire body of knowledge into classes and further division and subdivision done in the line with the format, rules and principles of each scheme (Ekere and Mole 2014).

The Dewy Decimal Classification (DDC)

The DDC was authored by Melvil Dewey. Born in 1851, he was an American and a graduate of Amherst College. He devised the DDC scheme in 1873 at the age of 22 and first applied it to the Amherst College library. It was first published in 1876 and has since gone through many languages and editions including the abridged edition for the use of small libraries. It developed from 44 pages in its first edition of 1876, including 14 pages of front and back matter, 12 pages of summaries and schedules, and 18 pages of index. DDC is the most widely used library classification scheme in the world. It is use in more than 135 countries and translated into over 30 languages.

Features and Applications of Dewey Decimal Classification

The structure of DDC can be described in 3 aspects: (a) hierarchical classification – it developed progressively from the general discipline to the specific in subordinate and coordinate relationships. It has 10 main classes which are assigned to broad disciplines. The main classes of DDC correspond roughly to the fundamental disciplines of knowledge which are philosophy, religion, social science, sciences, technology, arts and history. (b) Decimal Classification – the main classes, division, sections, sub-division proceed or divide in tens. Each of the 10 main classes of DDC is divided into 10 divisions and each of the 10 divisions is subdivided into 10 sections and further subdivision of each of the 10sections may be made in tens by the addition of a decimal point and more digits until provision is made for every subject in a discipline. Since the division in DDC is in tens, it is called a decimal classification and because the numbers are decimal and not consecutive, the order of progression is decimally arranged. (c) Classification by Discipline not by Subject. Basic classes are organized by traditional academic disciplines or fields of study. This is the most basic principle of the DDC. Given subjects are scattered in the various disciplines of the classification.

The basis for DDC arrangement and development of subject is by discipline. This is why various aspects of a topic may be placed in different class numbers depending on the particular discipline the work is treating. The implication is that there is likely to be no one single place for a given subject. For e.g. 'Marriage' can be seen under: Music (music for marriage ceremonies – 781.587); Philosophy (ethical consideration in marriage – 173); Sociology (sociological studies of marriage – 306.81) and Law (legal aspects of marriage – 346.016). Other features include:

i) Notation – The DDC employs a pure notation consisting only of Arabic numerals divided decimally. A 3-figure numeral is used consistently and this makes the system easier for the user. It notation is partially hierarchical and occasionally expressive and has mnemonic features and quality of brevity, simplicity and flexibility.

ii) Rules – The rules provided in the DDC are inadequate to ensure the consistent use of the scheme.

iii) The Index – The DDC index is an alphabetical relative index. It provides alphabetical references to subject terms in the classification and also shows some of the relationships between subjects distributed in the classification.

iii) Auxiliary Tables of DDC – only 2 existed in DDC scheme before the advent of the 19th edition published 1979. They were: the form or standard and the area or country tables. The 20th edition has 5 additional tales from 3 to7.

Colon Classification Scheme

Colon Classification (CC) is a pioneer faceted classification authored by S. R. Ranganathan and published in 1933. It is based on scientific principles and literary warrant. Unlike earlier schemes it does not provide ready-made class numbers; it has to-be synthesized. But like other schemes it first divides knowledge traditionally into main classes denoted by 1/9 and A/Z: A/M Sciences; N/S Humanities; T/Z social Sciences. Between M and N is interposed a main class 'Mysticism and Spiritual Experience' denoted by Δ (Delta). 1/9 denote newly recognized main classes. Under each of these main classes are listed concepts (termed Isolate) pertaining to that subject. The isolates arranged in arrays and chains are grouped under facets, and facets belong to any of the five fundamental categories – personality, matter, energy, space, time (PMEST) – postulated by Ranganathan (Prytherch 2005).

Features and Applications of Colon Classification

Isolate numbers preceded by the main class digit are arranged in the PMEST order, which is of decreasing concreteness. In the facet formula each category has its own indicator digit which acts as a signpost to identify back the category of a particular isolate number. In addition there are common schedules for languages, space and time; and a schedule of common isolates representing viewpoints, or document formats applicable to all main classes. A category may be manifested in more than one facet. All the facets within a category or in the overall facet formula are arranged by objectively-stated principles of facet sequence such as wall/picture, or cow/calf. Complex and multi-disciplinary subjects are classified by phase analysis. The notation is highly mixed and hospitable to new concepts at their logical places.

In using a faceted scheme a classifier would analyze the subject of a work into its various facets and then apply notational synthesis. Notational synthesis involves linking together, in a specified order and manner, the symbols representing the subject of the work within these facets to create the notation. Example: "Design of submarines in the United States in the 20th century." The classifier would first analyze the subject into its separate components: central concept (submarine), process (design), place (United State), time (20th century). Next, the index and schedules of the scheme would be consulted to discover the notation for each these concepts. The notational elements would then be combined to form the complete notation. In Colon Classification 6th edition (CC6) it will be classified thus:

D5254 – D is main class engineering,
5254 – Represents submarine
4 – Design in class (engineering)
73 – United States
N – 20th century. The complete notation, including the linking symbols, is: D525:4.73'N

Colon Classification (CC) uses a mixed notation. Roman letters, Greek letters and Arabic numbers. Citation order is controlled by the facet formula PMEST. In CC6 each facet is introduced by distinctive punctuation mark:

Personality: (Comma)
Matter: (Semicolon)
Energy: (Colon)
Space: (Point)
Time: (Apostrophe or point)

In CC7 more symbols have been introduced to signify different types of relationships within facets, making it unnecessarily complicated. As mentioned earlier CC7 contains many errors and it has increased in complexity to a degree that makes it very difficult to use. According to Foskett (1996) it does not reflect Ranganathan's contribution to classification theory.

Bibliographic Classification

This is scholarly and detailed scheme devised by H. E. Bliss and first applied in the College of the City of New York where he was librarian in 1902. Following the publication of two massive theoretical works on the organization of knowledge, the full scheme was published in four volumes over the period 1940 – 1953. Its main feature was the carefully designed main class order, reflecting the Comptean principle of gradation in speciality. It contained numerous Systematic Auxiliary Schedules for the building of detailed classmarks; four of these were applicable to all classes (form; time; place; language) and the others to particular subjects. The Scheme had some success in Britain and the Commonwealth, some 80 libraries eventually applying it.

Features and Application of Bibliographic Classification

Work on a radical revision, incorporating the advances in logical facet analysis initiated by Ranganathan and developed by the Classification Research Group (CRG) in Britain, began in the early 1970s and this revision (BC2) has now superseded the earlier Scheme. BC2 is virtually a new system, using only the broad outline developed by Bliss; the vocabulary is very much greater, the number of enumerated terms is ten times as great – and far more if the synthesis possible is considered. The main features of BC2 are: main-class order based on closely-argued theoretical principles: each main-class, and sub-classes where necessary, are fully faceted; a comprehensive and consistent citation order is observed throughout all classes; the filing order consistently maintains general-before-special; the notation is fully faceted and synthetic; fully detailed alphabetical indexes to all classes are provided. The new system began publication in 1977 (originally Butterworth, now Bowker-Saur) and will be completed in 22 volumes.

Library of Congress Classification (LC)

The LC is the scheme of classification used in the Library of Congress. The outline of the scheme was drawn up by Dr. Herbet Putnam, in 1897, and is based in some respects on the Dewey Decimal and Cutter's Expansive schemes, the schedules being worked out by specialists in the various subjects. The main tables have been published, each with its own relative index, as completed, and revised from time to time. The result is a series of special schedules of greater details than any other scheme.

Features and Application of Library of Congress Classification Scheme

The scheme is compiled to meet the needs of the library's huge collection of books. It typifies the enumerative method of classification and retains all powers of growth in the hands of the compiler. It is too detailed and complex for use in any but the largest library but the subject schedules are most useful for special and university libraries. There are no tables for such-division by from or place which can be used in any part of the scheme. The notation is mixed, consisting normally of two letters and four figures used arithmetically, blanks being left in the alphabet and in the numbers for future insertions. The schedules are undergoing constant amendments and updating.

Each schedule has a similar if not identified format. Each schedule comprises of:

1. A prefatory not, containing a brief history of the schedule and as well as remarks on the scope of the schedule.
2. A synopsis, consisting of a list of all double letters covered in the schedule.
3. An outline, in greater detail than the synopsis of the portion of the classification covered in the schedule.
4. The schedule, containing the main classification tables;
5. Any necessary auxiliary table;
6. A detailed index, and
7. Any supplementary pages of additions and changes to the schedule.

Other general features of the LCC Scheme include the following:

1. Order of the Main Classes – the order of the main classes is based partly on Cutter's Expansive classification and partly on practical considerations in the Library of Congress. The order goes from one subject to another without a systematic relationship between them.

2. Enumeration – LCC is a highly enumerative classification and not an analytic-synthetic scheme. What this means is that each time they have a subject, they would specify all the details or sub divisions they feel are needed to classify it.

3. Notation – mixed, comprising of letters and numbers. Usually, main classes are represented by a capital letter, and a second capital is used to show the sub-class of Technology.

4. Cutter Number – LC in its notation often uses the alphabetical order as its most detailed treatment of subjects.

Thus, LC uses letters and numbers, plus more letters and numbers. The second set of letters and numbers are the Cutter Number. Example,. Cutter Numbers are used for two purposes.

a) To specify detailed subjects: e.g. BF – Psychology; BF575 – Special forms of emotion; .A5 – Anger; .A9 Awe, .T5 Timidity; .L8Love.

b) To specify authors of books: - require a unique number for every book in the Library of Congress. The Cutter number representing the author of the book would be added.

National Library of Medicine (NLM) Classification

National Library of Medicine (NLM) Classification (NLMC 1999), is an example of a special subject classification system that was expressly designed to be fully compatible with an extensive, existing general classification system. In this case the general system is the LCC. What the original designers of the NLM Classification proposed was a classification scheme that would (first) follow LCC in both style of classification and general pattern of notation; (second) develop its own classification scheme for medicine and related subjects, fitting it into LCC's vacant class W; and (third) develop its own scheme for the preclinical sciences, using LCC's vacant subclasses QS through QZ (in LCC main class Q for science). In response, the LC agreed with NLM that the main class W and subclasses QS to QZ would be permanently excluded from LCC. For any material in its collection that does not fall within either medicine or the preclinical sciences, NLM uses LCC as it stands.

Features and Application of NLM Classification

The resulting NLM classification system has many advantages for a specialized medical library such as NLM. The organization and development of the subject matter that is its primary concern is fully under its control, while provisions for peripheral subjects are developed and kept up to date by outside specialists, in this

case the LC staff. Yet the two parts of the system are fully compatible. One especially useful feature of the system is its detailed index, which contains terms chosen to conform to those in MeSH and follows each major term or sub-term with a class number or range of numbers, including numbers from LCC.

Universal Decimal Classification (UDC)

Universal Decimal Classification (UDC) began as an adaptation of the Dewey system to make it useful for compiling a universal bibliography and indexing the journal articles the bibliography would cover. Considerably more detailed provisions are required for journal indexing than for book cataloguing, and perhaps for this reason the UDC designers turned more readily toward modern classification theory than did either of the two major American classification theory than did either of the two major American classification systems.

As UDC grew, it incorporated many of the features of a faceted scheme, providing for a considerable degree of synthesis, or number building, through combing concepts by means of auxiliary devices. An especially interesting feature is the use of punctuation marks or other symbols to indicate the relationships of the parts of a built number: a colon for simple relationship equal sign for language of work, quotation marks for time or period, and so on. UDC is a powerful system, one that is particularly suited to the machine environment: relatively simple retrieval algorithms can be written that can refine or expand searches simply through operations on its class numbers.

Using UDC the classifier can express the full coverage of a work in the notation. The coordination symbol + (plus) connects two or more non consecutive UDC numbers to express compound topics. Examples:

Cereals and fruits: 633.1+634.1
Mineralogy and metallurgy: 549+669
Iran and Iraq: (55+567)
The extension symbol / (forward slash) connects the first and last number of a series for consecutively listed UDC notations to form a number for a range of topics. Example:
Physics and chemistry: 53/54
Judaism and Islam: 296/297
Attention, learning and creativity: 159.952/954
Arctic and Antarctic: (98/99)

II. Conclusion

This chapter has focused on Subject Cataloguing and attempt has been made to explain its conceptual framework. The controlled term lists including Library of Congress Subject Headings (LCSH), Sears List of Subject Headings (FAST), and Medical Subject Headings (MeSH) have been discussed. We continued with the classification schemes such as Bibliographic Classification (BC), Colon Classification (CC), Dewey Decimal Classification (DDC), Library of Congress Classification (LCC), National Library of Medicine (NLM) Classification, and Universal Decimal Classification (UDC). The features and applications of the classification schemes are briefly discussed and illustrated. It is recommended that librarians should get acquainted with these subject cataloguing principles and their associated subject headings and classification systems in order to be more effective in their knowledge organization and library services delivery either at the library administrative environment or at the library schools.

References

[1]. ALA (1983). *Glossary of Library and Information Science*. Chicago: American Library Association, p.220

[2]. ALA(2019).Cataloging Tools and Resources: Subject Headings. Updated March 2019: https://libguides.ala.org/catalogingtools/subjects

[3]. Browman, J. N. (2003). *Essential Cataloguing*. London: Facet Publishing

[4]. Cutter, C. (1904). *Rules for a Dictionary Catalogue*, 4th Ed. Washington, DC: Government Printing Office. 6ff rewritten.

[5]. Ekere, F. C. & Mode, A.J.C. (2014). *Theory and Practice of Cataloguing and Classification*. Enugu: Praise House Publishers

[6]. Foskett, A. C. (1996). *The Subject Approach to Information*. 5th Ed. London: Library Association.

[7]. Glossary of Library and Information Science (2019). Accessed from: https//www.librarianshipstudies.com/2015/04/glossary-of-library-information-science.html

[8]. Hodges, T. L. (2017). Subject Cataloguing Principles and Systems. In: *Encyclopedia of Library and Information Sciences, 4th edition*. Volume VII. New York: Taylor & Francis.

[9]. Joudrey, D. N. (2017). Cataloguing. In: *Encyclopedia of Library and Information Sciences*. Volume I; 4th ed. London: Taylor & Francis pp.723 – 732.

[10]. Medical Subject Headings, (2003), 1st Ed. U.S. Department of Health and Human Services, Public Health Service, National Institute of Health, National Library of Medicine: Bethesda, MD. Available at http://www.nlm.nih.gov/mesh/.

[11]. Miller, J and Bristow, B.A., (2007). *Sears List of Subject Headings* (Eds.).; New York: H.W. Wilson Company.

[12]. National Library of Medicine Classification (1999), 5th Ed. National Library of Medicine: Bethesda, MD. NIH Publication, no. 00-1535; http//www.nlm.nih.gov/class/ (accessed October 2007).

[13]. Prytherch, R. (2005). *Harrod's Librarians' Glossary and Reference Book*. 10th Ed., London & New York: Routledge. Taylor & Francis,p.153

[14]. Svenonius, E. (2000). *The Intellectual Foundation of Information Organization*; The MIT Press: Cambridge, MA; 139