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The Work Architecture of the Sears List of Subject Headings (SLSH), Library of Congress Subject Headings (LCSH), and Medical Subject Heading (MeSH): An Introduction

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Abstract:

Subject headings are the creative initiative of a librarian from his love to organise things. Technically, subject headings are the standardized words assigned to a concept. Using subject headings helps to decrease the “junk,” or irrelevant results. And it is based on the theme of the topic, not the words that appeared in the text. According to Charles A. Cutter, the most important subject cataloguing principle was a consideration of the best interest of the catalogue user. Cutter stated: “The convenience of the public is always to be set before the ease of the cataloguer”. This project focuses on the three most popular subject heading lists: Sears List of Subject Headings (SLSH), Library of Congress Subject Headings (LCSH), and Medical Subject Heading (MeSH). Starting from an overview and background study, this project further nurtures the work architecture, functionalities, usage, advantages and disadvantages of each of the selected subject heading lists.

Keywords: Subject Headings, Subject Heading List, Sears List of Subject Headings (SLSH), Library of Congress Subject Headings (LCSH), Medical Subject Heading (MeSH), Functionality, Structure, Advantages, Disadvantages

1. Introduction:

Subject Headings are the most specific words or phrases that describe a book or other library item (such as a serial, sound recording, moving image, cartographic material, manuscript, computer file, e-resource, etc.). It’s added to the bibliographic record, which works as an index, from a list of preferred subject access phrases (restricted vocabulary). Bibliographies and indexes employ subject headings.

The controlled vocabulary chooses a synonym for the subject header. It shows that homonyms can have several meanings. Vocabulary control solves problems produced by the document’s natural language. If vocabulary control isn't implemented, indexers may use different words to describe the same subject when indexing and searching. This causes a “mismatch”, making information harder to find. Cross-references are used with headings to move the user from non-heading terms to heading terms and from broader and related topics to the chosen subject. You can add form, geographical, historical, and thematic subdivisions to a subject title to make it more particular, or you can add a parenthetical qualifier.

1.1. Definition:

A subject heading is part of a systematic list of terms that describe a given subject matter, e.g. like in a library catalogue.
According to Reitz, a subject heading is “The most specific word or phrase that describes the subject, or one of the subjects, of a work, selected from a list of preferred terms (controlled vocabulary) and assigned as an added entry in the bibliographic record to serve as an access point in the library catalog. A subject heading may be subdivided by the addition of subheadings (example: Libraries--History--20th century) or include a parenthetical qualifier for semantic clarification, as in Mice (Computers).”

Lazarinis describes that “Subject headings are controlled lists of terms or phrases used to describe the subjects of items. They facilitate access to resources by subject, as they define a set of additional topics included in an item, in contrast to classification, which deals only with the main subject.”

1.2. 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. In his book Chatterjee (2017) explained Subject Heading List as “a standard list of terms to be used as subject headings, either for the whole field of knowledge or for a limited subject area, including references made to and from each term, notes explaining the scope and usage of certain headings, and occasionally corresponding class numbers”.

Subject heading list contains 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 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 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 heading lists may have provision for the construction of pre-coordinated indexing strings including headings, plus rules for combining the single terms in strings and one or more levels of subheading. Based on these rules a subject heading may also be subdivided by the addition of form subdivisions, geographical subdivisions, chronological subdivisions, and topical subdivisions to add greater specificity.

In this project three most popular subject heading lists and their work architecture are discussed, and those are:

(i) Sears List of Subject Headings (SLSH),
(ii) Library of Congress Subject Headings (LCSH), and
(iii) Medical Subject Heading (MESH).

2. Sears List of Subject Heading (SLSH)
In the age of subject cataloguing, for the purpose of subject entry and decide subject heading, Sears List of Subject Heading (SLSH) has a great importance. Since the first edition in 1923, the Sears List has served the unique needs of small and medium-sized libraries (having up to 20,000 titles in all subjects), suggesting headings appropriate for use in their catalogues and providing patterns and instructions for adding new headings as they are required. It is alphabetical list of terms and it is unique among subject heading list. The cataloguer must develop a larger vocabulary because it is not complete list of terms.

2.1. History of SLSH:

The Sears List of Subject Headings was first designed in 1923 by Minnie Earl Sears (1873–1933) based on the needs and requirements of small and medium libraries for simple and broader subject headings for the use of their dictionary catalogues. It is based on LCSH but in more simple phrasing and limited entries. The first edition contained only 3200 preferred headings.

Another important change introduced since its 15th edition is its thesaurus format of listing subject heading by using standard thesaurus abbreviations, i.e. NT, BT, RT, USE and SA instead of x, xx etc. This format conforms the ANSI/NISO standards.

2.2. Latest Edition of SLSH:

The latest edition of the Sears List published in 2018, it is its 22nd edition. This is the first edition of Sears List produced by Grey House Publishing, which acquired the title in 2018. In addition to updating the look of Sears List with cleaner lines and more accessible typography, the content is now also available as a free, online database that librarians can access, at no charge for one year. The major feature of this new edition of the Sears List is the inclusion of more than 1,600 new and revised subject headings. New headings in this edition reflect the changing needs of library users, which includes addressing the growing literature in the areas of science, technology, engineering, and mathematics (STEM).

The Sears List of Subject Headings is also available as a database and as MARC records for direct integration with a library’s ILS.

2.3. Essential Features of SLSH:

(i) **Easy-to-use thesaurus-like format**, with an emphasis on subject terms that makes sense to catalogers
(ii) **Helpful guidance** on which subject terms to use for thousands of categories of information
(iii) **Helpful notes** outlining USED FOR, SEE ALSO, BROADER TERM, NARROWER TERMS, and RELATED TERM
(iv) **Scope notes** to clarify the specialized use of a term or to distinguish between terms that might be confused RDA compliant.
(v) **Agreement with the Dewey Decimal Classification system** to ensure that subject headings conform with library standards.

2.4. Fundamental Principles of SLSH:
The principles of SLSH is based on LCSH with certain modifications and simplification. There are different types of principles in SLSH but they are broadly classified into the following five types -

2.4.1. Direct and Specific Entry:

Charles A. Cutter’s Rules for a Dictionary Catalogue states “Enter a work under its subject heading, not under the heading of a class which includes that subject.” This principles states that, a work is always entered under a specific term than under broader heading that includes that specific concept. If a specific subject is not found in the Sears list then the heading for the larger group or category to which it belongs should be consulted.

2.4.2. Common Usage:

This principle states that, if a word has more than one spellings, then the most popular ones are chosen for creating the subject headings. That means the term chosen as preferred headings are from common usage. Ex, in SLSH, the subject heading should be create under “Dinners” rather than “Banquets”.

2.4.3. Uniformity:

In case of compiling SLSH uniformity should be maintained throughout the book. That means uniform structure should be maintained for each and every entry.

Again uniformity also maintained in choosing of subject heading also. Once a heading chosen should be consistently and uniformly applied in its scope, meaning and spelling until a decision is taken to the contrary. It, however doesn’t mean that old terms can’t be deleted or new terms can’t be added.

2.4.4. Classification and Subject Heading:

The cataloguer should recognize a fundamental differences between classification and subject headings for the library catalogue. Classification determines the arrangement of items on the shelves and here the items are arranged according to their subject or similarity. In case of cataloguing the arrangement is alphabetically irrespective of subject or similarity. And the subject headings is more important in case of cataloguing than classification scheme. Then in SLSH the arrangement follows as in cataloguing i.e. alphabetical arrangement irrespective of subject or similarity.

2.4.5. Maintaining a Catalogue:

Library catalogue is a vital function at the very centre of a library, and as such it is always growing and changing to reflect the growing collection and to meet the changing needs of the users. It is challenge to the cataloguer to add new records, revised existing records and make all the appropriate references. For this purpose, to make the task of the cataloguer easier, SLSH provides a list of BT, NT, RT, USE and other cross references with each entry of subject heading.

2.5. Types of Subject Headings in SLSH:
In SLSH there are four types of subject headings -

2.5.1. Topical Headings:

Topical Subject Headings are simply the words or phrases for common things or concepts that represent the content of various works. In choosing the word or phrase that makes the best subject heading several things should be considered. These are,
- The literary warrant or the language of the material being catalogued.
- The word most commonly used in the literature i.e. the term chosen as preferred headings are from common usage.
- Uniformity should be maintained in subject heading by choosing a single word from its synonyms or near-synonyms and follow this throughout the book.
- Subject headings should be clear and unambiguous.

Ex, United States - History - 1961-1965, Civil War, this subject heading clearly defines that it is American Civil War.

2.5.2. Form Headings:

Form heading describes not only the subject content of a work but its form. In other words, a form heading tells us not what a work is about but what it is. Form in this context means the intellectual form of the material rather than the physical form of the item. Some types of form headings are as follows,
- The general arrangement of the material and the purpose of the work, e.g. Almanacs, Atlases, Directories and Gazetteers.
- Heading of major literary form e.g. Fiction, Poetry, Drama and Essays are usually used as topical subject headings.
- Minor literary forms also known as genres, e.g. Science Fiction, Epistolary Poetry and Children’s Plays, are much more numerous and are often assigned to individual literary work.
- Physical form of some non-book materials, such as puzzles, sound recording, or comedy films are also identified by form headings.

2.5.3. Geographic Heading:

Many works in a library’s collection are about geographic areas, countries, cities etc. The appropriate subject heading for such a work is the name of the place in question. Geographic headings are the established names of individual places from as large as Africa to places as small as Walden Pond (Mass).

The Sears list doesn’t provide geographic headings, which are numerous and far beyond the scope of a single volume. The geographic that are found in Sears are such as, United States, Ohio, and Chicago (III.), are only as examples. The geographic headings and geographic subdivisions found in Sears follow the form of abbreviation for qualifying states, provinces, etc.
Ex. United States - Census

2.5.4. Names:
Still other materials in a library’s collection are about individual persons, families, corporate bodies, literary works, motion pictures, etc. The appropriate heading for such material is the unique name of the entity in question. The three major types of name headings are Personal names, Corporate names and Uniform titles.

Individual or personal name headings are usually established in the inverted form, with dates if necessary, and with See references from alternate form. Ex, Clinton, Bill would require a See references from “Clinton, William Jefferson” and if the library had material about any other person called Bill Clinton, then the name of the president would need to take the form Clinton, Bill, 1946 - .

Corporate name headings are the commonly established names of corporate bodies, such as business firms, institutions, buildings, sport teams, performing groups etc. Ex, Rockefeller Centre

Uniform titles are the established names of sacred scriptures, anonymous literary works, periodicals, motion pictures, radio and television programmes etc. Ex, Go with the wind (motion picture).

2.6. Grammar of Subject Headings in SLSH:

In order to construct subject headings the grammar of the subject headings need to be consistently applied.

2.6.1. Single Nouns:

A single noun is the ideal type of subject heading when the language supplies it. Such terms are not only the simplest in form but often the easiest to comprehend. A choice must be made between the singular and plural forms of a noun. The plural are the most common but in practice both are used.

Ex, Abstract ideas and the names of disciplines of study are usually stated in the singular. An action, e.g. Eating is also expressed in singular. But headings for concrete things that can’t be counted are most commonly in the plural form, e.g. Children, Playgrounds.

2.6.2. Compound Headings:

Subject headings that consists of two nouns joined by “and” are several types.

(i) Some headings linked two things because together they form a single concept or topic, e.g. Bow and arrow, Good and evil.

(ii) Some headings are so closely related, they are rarely treated separately, e.g. Forest and forestry, Publishers and publishing.

(iii) Some headings are so closely synonymous, they are seldom distinguished, e.g. Cities and towns, Rugs and carpets.

2.6.3. Adjective with Nouns:
Often a specific concept is best expressed by a noun with an adjective, e.g. **Unemployment insurance**, **Buddhist art**.

### 2.6.4. Phrase Headings:

Some concepts that involve two or more elements can be expressed only by more or less complex phrases. This are the least satisfactory headings, as they offer the greatest variation in wording, are often the longest, and may not be thought of readily by either the maker or the user of the catalogue, but for many topics the English language seems to offer no more compact terminology.

Ex, **Insects as carriers of disease**, **Violence in popular culture**.

### 2.7. Subdivisions:

Use of subdivisions in Sears List included are as follows:

#### 2.7.1. Topical Subdivisions:

Topical subdivisions are those subdivisions that brings out the aspect of a subject or point of view present in a particular work.

Ex, History of subject : **Clothing and dress - History**  
Philosophy of the subject: **Religion - Philosophy**  
Research in the field: **Oceanography - Research**  
Laws about it: **Automobiles - Laws and legislation**  
How to study or teach the subject: **Mathematics - study and teaching**

#### 2.7.2. Geographical Subdivisions:

Another aspect of subjects that can be brought out in subdivisions is geographic specificity. The unit used as a subdivision may be the name of a country, state, city or other geographic area. A topical heading with a geographic subdivision means simply that topic in a particular place. Ex, **Bridges - France**, **Agriculture - Ohio**.

Many subject heading in Sears list are followed by the parenthetical phrase “*(May subdiv. geog.)*”. In application this means that if the work in hand deals with that subject in general, only the heading itself is used; but if it deals with the subject in a particular place, the heading may be subdivided geographically. Ex, **Theater** (may subdiv. geog.), here the subject heading “**Theater**” may use alone as a subject and may be subdivided geographically for a particular nation like, **Theater - Paris**.

#### 2.7.3. Chronological Subdivisions:

Chronological subdivisions, which correspond to generally accepted periods of a country’s history or to the spans of time most frequently treated in the literature, make such a search much simpler by bringing together all works on a single period of history. Ex, **United States - History - 1600-1775**, **Colonial period**.
The Sears list includes chronological subdivisions only for those countries about which a small library is likely to have much historical material, e.g. United States, Canada, Great Britain, France Germany and Italy.

2.7.4. Form Subdivisions:

Form subdivision tell what an item is rather than what it is about. Some of the most common subdivisions are, Bibliography, Catalogues, Dictionaries, Gazetteers, Handbooks, manuals, Maps, Pictorial works, Portraits, Registers and Statistics.

Form subdivisions are particularly valuable under headings for the large fields of knowledge that are represented by many entries in a library’s catalogue. In applying form subdivisions the cataloguer should be guided by the character of an item itself, not by the title.

Ex, Geology - Maps, Children’s literature - Bibliography.

2.8. Types of References Use in SLSH:

References in SLSH are grouped into three main categories-

2.8.1. Specific “See” References:

The “UF” symbol stands for “Used for”, and it designates those preferred terms or phrases form which “see” references are to be made.

The most frequent and helpful varieties of See references direct the users form:

- Synonyms or near synonyms, e.g. Chemical geology USE Geochemistry
- The second part of the compound heading, e.g. Motels USE Hotels and Motels
- Conjunctive i.e. terms connected by “and”, e.g. Religion and Science USE Science and religion
- Variant spelling, e.g. Gipsies USE Gypsies
- Opposites when they are included without being specifically mentioned, e.g. Disobedience USE Obedience
- Singular to plural when two forms are not file together, e.g. Goose USE Geese

2.8.2. Specific “See also” References:

A “See also” reference connect a heading to a related heading or headings designated in the SLSH as NT “Narrow term(s)” and RT “Related term(s)”, if the library has material listed under the both headings and it normally move downward from a general to a more specific term(s), e.g. Indoor gardening See also Terrariums; Window gardening.

Ex, Actor

BT Entertainers
NT Comedians
RT Acting

General References: The symbols “SA” stands for “See also” and introduces a general reference, which refers for one heading to an entire category or class of headings rather than
an individual heading. A general explanation or direction is given instead of a long list of individual headings.

Ex, Furniture
See also Book cases
   Chairs
   Desks
   Tables

2.9. Advantages of Using SLSH:

(i) Sears List is flexible and expandable.
(ii) SLSH is comparatively simpler to use than LCSH
(iii) The rules and principles are fairly explicit in their directions and containing scope notes and specific instruction for their use.
(iv) It is small in size, easy to handle and less expensive hence useful for small and medium library.
(v) SLSH use terms of common usage for creating subject heading, that is familiar with most of the user.
(vi) SLSH provide useful reference guide for the user and also to the library staff.

2.10. Disadvantages of Using SLSH:

(i) SLSH is generally useful for small libraries with near about 20,000 collection and not much helpful for large libraries with huge collection.
(ii) The cataloguer must develop a larger vocabulary because it is not complete list of terms.
(iii) SLSH is not backed up by theoretical foundations intrinsic to subject indexing.
(iv) With the growth of knowledge and development of new subjects, facet and phase relations, this enumerated subject heading lists are not equipped to respond to new challenges in subject cataloguing.

3. Library of Congress Subject Headings (LCSH)

The Library of Congress Subject Headings (LCSH) is perhaps the most widely adopted subject indexing language in the world, has been translated into many languages. This subject heading list was developed by the Library of Congress and is intended for larger libraries with fairly comprehensive collections. LCSH has been actively maintained since 1898 to catalogue materials held at the Library of Congress. Proposals for additions and changes are reviewed regularly at staff meetings in the Policy and Standards Division (PSD) and an approved list is published. The Library of Congress list is much more detailed and tends to use more complex terminology in describing subjects. It takes up 5 very large volumes, and provides more ways of listing topics that are interrelated.

3.1. History of LCSH:

The first edition of the Library of Congress list, called Subject Headings Used in the Dictionary Catalogues of the Library of Congress, was printed in parts between 1909 and 1914. Supplementary lists were issued as required, followed by a second edition in 1919. Later editions were published at irregular intervals. The title was changed to Library of Congress Subject Headings when the eighth edition was published in 1975.
Since the inception of the list, headings have been created as needed when works were cataloged for the collections of the Library of Congress. Because the list has expanded over time, it reflects the varied philosophies of the hundreds of catalogers who have contributed headings. Inconsistencies in formulation of headings can usually be explained by the policies in force at the varying dates of their creation.

3.2. Latest Edition of LCSH:

The latest edition of the LCSH published in 2018, it is its 40th edition. The fortieth edition of Library of Congress Subject Headings (LCSH 40) contains headings established by the Library through January 2018. The headings included in this list were obtained by creating a file consisting of all subject heading and subdivision records in verified status in the subject authority file at the Library of Congress. There were 342,947 authority records in the file then.

The creation and revision of subject headings is a continuous process. Approximately 5,000 new headings, including headings with subdivisions, are added to LCSH each year. Proposals for new headings and revisions to existing ones are submitted by catalogers at the Library of Congress and by participants in the Subject Authority Cooperative Program (SACO). It is now available in various formats including hard copy, microfiche, CD-ROM and online through the web (www.locis.loc.gov).

3.3. Fundamental Principles of LCSH:

There are different types of principles in LCSH but they are broadly classified into the following types -

3.3.1. User Needs:

The Library of Congress subject headings system seeks to provide useful subject access points to assist catalogue users in identifying desired materials.

- **Objective of Subject Access Points** - Two basic functions of subject headings are assumed:
  (i) Subject headings enable the catalog user to find in the catalog an item of which the subject’s known; and,
  (ii) Subject headings enable the catalog user to find what the library has on a given subject.

These functions parallel those attributed to name headings in the catalog. Basically, they assist in the location of individual items in the collection as well as collocation of related items.

- **Current Usage** - User needs are best met if headings reflect current usage in regard to terminology. Thus, terms in current use are selected in establishing new subject headings. Current usage is ascertained through research in reference works, general indexes and thesauri, current literature in the appropriate field, and the works(s) being cataloged.

3.3.2. Literary Warrant:
The Library of Congress collections serve as the literary warrant (i.e., the literature on which the controlled vocabulary is based) for the Library of Congress subject headings system. The number and specificity of subject headings included in the Subject Authority File (the machine-readable database containing the master file of Library of Congress subject headings from which the printed list, the microform list, the CDMARC SUBJECTS, etc. are generated), are determined by the nature and scope of the Library of Congress collections. Subject headings are established as they are needed to catalogue the materials being added to the collection or to establish links among existing headings. In recent years, headings contributed by libraries engaged in cooperative activities with the Library of Congress based on the needs of their collections have also been included.

3.3.3. Uniform Heading (one heading per subject - control of synonymous):

In order that all materials on a particular subject are collocated so that recall may be increased, each subject is represented by only one heading. Synonymous terms and variant forms of the same heading are included as entry vocabulary, i.e., as referred-from terms. In a few instances, duplicate entry headings, i.e., the same heading in different word order or configuration, are made in order to provide access points to significant words imbedded in the heading by bringing them to the filing position.

3.3.4. Unique Heading (one subject per heading - control of homographs):

In order to ensure precision and to minimize false hits in subject retrieval, each heading represents only one subject. Homographs are distinguished by parenthetical qualifiers.

3.3.5. Specific and Direct Entry:

For each subject, the most precise term naming the subject, rather than a broader or generic term which encompasses the subject. In rare cases, a broader term may be used when the most specific term is deemed too narrow and therefore not likely to be sought by catalogue users. Furthermore, each subject heading is listed directly under its most specific name, rather than under a broader or generic term that encompasses it.

3.3.6. Stability:

Changes to existing headings are necessary in order to maintain currency and viability of the subject headings list. On the other hand, the impact of changes on existing bibliographic records and the demands on personnel and resources in recataloging are also weighed in considering changes in an effort to maintain a balance between the need for change and the need for stability.

3.3.7. Consistency:

Wherever feasible, attempts are made to maintain consistency in form and structure among similar headings through the use of recurring patterns.

3.4. Types of Subject Headings in LCSH:

Subject headings in LCSH are constructed in variety of ways, ranging from single noun to complete descriptive phrases.
3.4.1. Single Word Headings:

A single word heading is usually a noun representing objects, things, persons, or concepts; e.g. Electrometallurgy, Skating.

Homographs are generally distinguished to avoid ambiguity by providing a noun or a phrase as parenthetical qualifier with the primary term. e.g. Constructivism (Art); Constructivism(Education).

3.4.2. Adjective Phrase Headings:

Adjectival phrase headings start with a modifier followed by a noun or a noun phrase. The modifier may be an adjective or it may be a noun used as an adjective. e.g. Dental records, Spanish literature.

3.4.3. Conjunctive Phrase Headings:

 Conjunctive phrase headings are refer to those subject headings which are composed of two or more nouns, with or without modifiers, connected by ‘and’ or ending with ‘etc’. e.g. Libraries and Society

3.4.4. Prepositional Phrase Headings:

Prepositional phrase headings are used to enable the subject cataloguer to express single but complex ideas for which there is no one word, e.g. Radioisotopes in Cardiology.

3.4.5. Inverted Headings:

Inverted headings serve the alphabetico-classed function of subordinating specific descriptors under their broad general categories. e.g. Proverb, Korean, Education, Elementary.

Names of geographic features have traditionally been inverted in order to place a significant word in the initial position instead of the generic word. e.g. “Lake Eric” is formulated as Erik Lake.

3.4.6. Proper Name Headings:

Any proper name can be used as a subject heading when that proper name becomes the subject of a work. Names are not, however, used as a pattern headings, or as examples, or that need special subject subdivisions or instructions printed under them. e.g. Bermuda Islands.

3.5. Subdivisions in LCSH:

LCSH requires extensive use of subdivisions as a means of combining a number of different concepts into single heading. Subdivisions in LCSH fall into several broadly categories as follows:

3.5.1. Topical Subdivisions:
Topical subheadings are used under the main headings or other subdivisions to limit the scope of the concept expressed by the heading to a special subtopic. Such headings are displaced by a long dash in LCSH, if two subdivisions are use, there are two long dashes.

e.g. Women --- Employment; Automobiles --- Motors --- Carburetors.

3.5.2. **Chronological Subdivisions:**

Chronological subdivisions are used to limit a heading, with or without subdivisions, to a particular time period, e.g. Philosophy, French --- 18th century.

3.5.3. **Form Subdivisions:**

Form subdivisions are used to indicate the form in which the material on a subject is organised and presented, and as such added as the last element to any heading. Form and topical subdivisions are both included within a general subdivision category.

e.g. Art - Bibliography - Periodicals (a serially issued art bibliography)  
     Art - Periodicals - Bibliography (a bibliography of art journals)

3.5.4. **Geographic Subdivisions:**

For geographic subdivisions, headings with the code (May Subd Geog) may have place names added which are not specially listed in LCSH.

e.g. Labour supply (May Subd Geog)

Now when we want to use subject headings for India’s labour supply we use,

**Labour supply - India**

3.5.5. **Free-Floating Subdivisions:**

There are a number of identical (or nearly so) subdivisions that can be applied in specially defined situations to primary headings and which wouldn’t have separate authority records for each heading and subdivision combination. The five broad groups of free-floating subdivisions are: general, under classes of persons and ethnic groups, under names of corporate bodies, persons and families, under place names, and entries controlled by pattern headings. All free-floating subdivisions are listed in *Free-floating Subdivisions: an Alphabetical Index*, published annually by LCSH, 2009.

3.5.6. **Subdivisions controlled by Pattern Headings:**

Certain form or topical subdivisions are common in a particular subject field or applicable to headings in a particular category. Instead of authorising them heading by heading within the category, they are listed under a chosen heading in the category. This chosen heading then serve as a “pattern heading” of subdivisions for headings in that category. The applicable subdivisions are displayed under the table of pattern headings in LCSH.

e.g. a set of subdivisions has been developed under Cancer and Tuberculosis, the pattern headings for the category Disease.
3.6. References Use in LCSH:

In LCSH, references associated with the headings are then listed in groups under the following codes:

- **USE** - Use this heading instead of others
- **UF** - Used For (do not use this as subject heading)
- **BT** - Broader Term (less specific)
- **NT** - Narrower Term (more specific)
- **RT** - Related topic (similar)
- **SA** - See Also (additional terms)

### 3.6.1. Equivalence relationship: USE References

The code UF denotes non preferred headings for the given term/phrase. The codes USE and UF function as reciprocal in the LCSH.

e.g.,

| Cars (Automobiles) | USE **Automobiles** | UF Cars (Automobiles) |

### 3.6.2. Hierarchical Relationships: BT and NT References

Subject headings are linked to other subject headings through cross-references now expressed as Broader Term (BT) and Narrower Term (NT). Headings connected by BT and NT references are all valid and the connections use reciprocals. A heading appearing as a BT must be matched by the reversed relationship as an NT.

e.g.,

<table>
<thead>
<tr>
<th>Vehicles</th>
<th>Transportation</th>
<th>Motor vehicles</th>
</tr>
</thead>
<tbody>
<tr>
<td>BT Transportation</td>
<td>NT Vehicles</td>
<td>BT Vehicles</td>
</tr>
<tr>
<td>NT Motor vehicles</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.6.3. Associative Relationship: RT References

The associative relationship, expressed by the code RT (Related Term), link two headings that are associated in some manner other than hierarchical or equivalence sense. RT references provided under both terms in a reciprocal way.

e.g.,

<table>
<thead>
<tr>
<th>Ornithology</th>
<th>Birds</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT Birds</td>
<td>RT Ornithology</td>
</tr>
</tbody>
</table>

### 3.6.4. General References:
A general reference, represented by the code SA (see also), is a reference made not to specific individual headings but to an entire group of headings.

e.g. Wood working industries

SA names of specific industries e.g. Furniture industry and trade

3.7. Advantages of Using LCSH:

(i) The most important aspect of LCSH is the semantic richness contained within the schema. It is the richest controlled vocabulary in the world covering all subject areas.
(ii) It is more expressive than any single concept terms and just one or two main headings with subdivisions can be used to describe a resource in its entirety.
(iii) Controlled vocabularies of LCSH contains synonym and homograph control, not found in other controlled vocabularies.
(iv) It contains rich links of its syndetic structure through cross-referencing indicating relationships among terms with the use of BT for broader terms, NT for narrower terms, RT for related terms and UF use for.
(v) It is a pre-coordinated system that ensures precision and recall in retrieval.
(vi) It facilitates browsing of multiple concept or multi-faceted subjects.

3.8. Disadvantages of Using LCSH:

(i) The most common complaints about the LCSH are their difficulty of use for both catalogers and users.
(ii) While using LCSH, catalogers with years of experience are still confused on which heading is most appropriate and often have to refer to the rules manual when developing subject-heading strings.
(iii) Because of its complex syntax and application rules, assigning LC subject headings according to current LOC policies requires trained personnel.
(iv) One of the major disadvantages of using LCSH is users do not understand and are not familiar with the syntax, this impedes retrieval more than assisting it.
(v) LCSH subject headings were designed for a physical environment and the headings just do not work well with the boolean functionality provided by most of the keyword retrieval systems used by digital libraries.

4. Medical Subject Headings (MeSH)

Medical Subject Headings (MeSH) is a comprehensive controlled vocabulary for the purpose of indexing journal articles and books in the Life Sciences; it serves as a thesaurus that facilitates searching. Created and updated by the United States National Library of Medicine (NLM), it is used by the MEDLINE/PubMed article database and by NLM’s catalogue of book holdings. MeSH is also used by ClinicalTrials.gov registry to classify which diseases are studied by trials registered in ClinicalTrials.gov.

4.1. History of MeSH:

MeSH was introduced in 1960, with the NLM’s own index catalogue and the subject headings of the Quarterly Cumulative Index Medicus (1940 edition) as precursors. The yearly printed version of MeSH was discontinued in 2007 and MeSH is now available online only. It
can be browsed and downloaded free of charge through PubMed. Originally in English, MeSH has been translated into numerous other languages and allows retrieval of documents from different languages.

4.2. Latest Edition of MeSH:

The yearly printed version of MeSH was discontinued in 2007 and MeSH is now available online only. Online version of MeSH is available through https://www.nlm.nih.gov.

Online version of MeSH first started in 01 September, 1999 and updated regularly. Last updation is done on 01 November, 2019.

4.3. Structure of MeSH:

4.3.1. MeSH Record Type:

There are three basic types of MeSH Records: Descriptors, Qualifiers, and Supplementary Concept Records (SCRs).

(i) Descriptors:

This record type plays a central role in MeSH vocabulary as a unit of Indexing and retrieval. With the exception of Class 3 Descriptors, all descriptors are organised into a numbered tree structure or hierarchy that allows users to browse in a orderly fashion from broader to narrower topics. More than 35,000 records are listed. Descriptors are divided into four classes.

a) Class 1 Descriptors - Main Headings

These records are topical headings that are used to index citations in NLM's MEDLINE database, for cataloging of publications, and other databases, and are searchable in PubMed as [MH]. Most Descriptors indicate the subject of an indexed item, such as a journal article, that is, what the article is about. Descriptors are generally updated on an annual basis but may, on occasion, be updated more frequently.

b) Class 2 Descriptors - Publication Characteristics (Publication Types)

These records indicate what the indexed item is, i.e., its genre, rather than what it is about, for example, Historical Article. They may include Publication Components, such as Charts; Publication Formats, such as Editorial; and Study Characteristics, such as Clinical Trial. They function as metadata, rather than being about the content.

These records are searchable in PubMed as Publication Type [PT], and the terms in MEDLINE records are labeled as “PT” or <PublicationType> rather than “MH” or <MeSHHeading>.

They are listed in category V of the MeSH Tree Structures. A list is available of Publication Types, with Scope Notes.

c) Class 3 Descriptors - Check Tags
This class of descriptors is used solely for tagging citations that contain certain categories of information. They do not appear in the MeSH tree. Modernization has largely eliminated the need for the data type and many of the Check Tags have been changed to Class 1 headings that can be used either a MH or a Check Tag. Currently only two Class 3 descriptors remain: “Male” and “Female”.

d) Class 4 Descriptors - Geographics

Descriptors which include continents, regions, countries, states, and other geographic subdivisions. They are not used to characterize subject content but rather physical location. They are listed in category Z of the MeSH Tree Structures.

(ii) Qualifiers:

There are 81 topical Qualifiers (also known as Subheadings) used for indexing and cataloging in conjunction with Descriptors. Qualifiers afford a convenient means of grouping together those citations which are concerned with a particular aspect of a subject. For example, Liver/drug effects indicates that the article or book is not about the liver in general, but about the effect of drugs on the liver Qualifiers are searchable in PubMed as MeSH Subheadings [SH]. There is only a single type of Qualifiers in MeSH.

There are basically 3 types of qualifiers list available:

a) Qualifiers, with Scope Notes

Each Qualifier is defined by a Scope Note that provides guidance on how it should be used. e.g. blood - BL, - BLOOD

Used for the presence or analysis of substances in the blood; also for examination of, or changes in, the blood in disease states. It excludes serodiagnosis, for which the subheading “diagnosis” is used, and serology, for which “immunology” is used.

b) Qualifiers by Allowable Category (also known as AQ Lists)

MeSH Qualifiers are organised under a variety of subject categories. Each category reflects either a MeSH tree category, or useful topical category that is appropriate for the subgroup of qualifiers listed under it. For example: fluids and secretions are most often found in category A12 and the set of Qualifiers shown under it fits reasonably with most terms there. These lists are provided for MeSH Descriptors only as a starting point for determining which Qualifiers should be allowed, with further review and curation by NLM staff determining the final list of allowed Qualifiers for each heading. Note that a subset of Descriptors appear without any Qualifiers. In this case we refer to them as having the “Null List”.

e.g.,
A LIST - General Anatomy (e.g. BS/blood supply)
A1 LIST - Body Regions (e.g. BS/blood supply)
A7 LIST - Cardiovascular System (e.g. CH/chem)
A8 LIST - Nervous System (e.g. CH/chem)...etc

c) Qualifier Tree Hierarchy
MeSH qualifiers also arranged in a Tree Hierarchy and click on any of the qualifier in the hierarchy shows its details in MeSH browser.

e.g., **analysis**
    - blood
    - cerebrospinal fluid
    - isolation & purification
    - urine

**(iii) Supplementary Concept Records (SCRs):**

Supplementary Records, also called Supplementary Chemical Records (SCRs), are used to index chemicals, drugs, and other concepts such as rare diseases for MEDLINE and are searchable by Substance Name [NM] in PubMed. Unlike Descriptors, SCRs are not organised in a tree hierarchy. Instead each SCR is linked to one or more Descriptors by the Heading Mapped To (**HM**) field in the SCR. They also include a Indexing Information (**II**) field that is used to refer to other descriptors that are from related topics. SCRs are created daily and distributed nightly Monday-Thursday. There are currently over 230,000 SCR records with over 505,000 SCR terms. Like all MeSH records, SCRs are searchable in the MeSH Browser.

Four classes of SCRs exist:

*a) Class 1 Supplementary Records - Chemicals*

These records are dedicated to chemicals and are primarily heading mapped to the D tree descriptors.

*b) Class 2 Supplementary Records - Protocols*

These records are dedicated to Chemotherapy Protocols. They are heading mapped to the MeSH heading “Antineoplastic Combined Chemotherapy Protocols” and to chemicals used in the protocols found in D tree descriptors.

*c) Class 3 Supplementary Records - Diseases*

These records are dedicated to diseases and are primarily heading mapped to the C tree descriptors and anatomical headings found in the A tree.

*d) Class 4 Supplementary Records - Organisms (new for 2018 MeSH)*

These records are dedicated to organisms (e.g., viruses) and are primarily heading mapped to the B tree organism descriptors.

**4.3.2. Entry Vocabulary:**

Entry Vocabulary of MeSH consist of two types of element - Entry Terms and Other Cross-References.
(i) Entry Terms:

Entry terms, sometimes called “See cross-references” in printed listings, are synonyms, alternate forms, and other closely related terms in a given MeSH record that are generally used interchangeably with the preferred term for the purposes of indexing and retrieval, thus increasing the access points to MeSH-indexed data. Entry terms range from variations in form such as Heart Arrest and Arrest, Heart to substantial synonyms such as Heart Arrest and Asystole. Entry Terms are displayed as the Entry Term in the MeSH Browser, and exist as the <Term> element in XML MeSH.

Entry terms are not always strictly synonymous with the preferred term in the record or with each other. However, for the purpose of organizing the NLM-indexed literature, fine granularity is not always required, so the entry terms are equivalent to the preferred term for purposes of indexing and retrieval. Note, however, XML MeSH does identify strict synonymy between subsets of terms within a record. See the <Concept> element in XML MeSH and Concept Structure in XML MeSH Data.

(ii) Other cross-references:

Three kinds of informative references suggest other Descriptors in MeSH that relate to the subject and that may be useful in indexing, cataloging, or searching a particular topic.

a) See Related

See related references, also known as “associative relationships” are used for a variety of relationships between Descriptor records where a user of one Descriptor is reminded of another Descriptor which may be more appropriate for a particular purpose.

For example, the relationship may be between a disease and its cause:
Factor XIII Deficiency see related Factor XIIIa

Or, between an organ and a physiological process:
Bone and Bones see related Osteogenesis

In the MeSH Browser the See Related reference is displayed as See Also, and is the <SeeRelatedDescriptor> element in XML MeSH. For further discussion see Relationships in Medical Subject Headings.

b) Consider Also

The Consider Also reference is used is primarily with anatomical Descriptors to refer to groups of Descriptors beginning with a common stem rather than to a single Descriptor. In the MeSH Browser the reference is displayed as Consider Also, and as the <ConsiderAlso> element in XML MeSH.

Reference to other Descriptors having related linguistic roots, for example:
Brain consider also terms at CEREBR- and ENCEPHAL-.

c) Entry Combination
In some NLM systems using MeSH, certain Descriptor/Qualifier combinations are prohibited by a special MeSH data element called the `<EntryCombination>` in XML MeSH, and Entry Combination in the MeSH Browser. For example, the Descriptor Accidents cannot be used with the Qualifier prevention & control, but instead of this combination, the Descriptor Accident Prevention should be used.

d) MeSH Tree Structures

In some thesauri the function cross references to broader and narrower terms is comparable to the hierarchical relationships in the MeSH Tree Structures, though hierarchies enable multiple levels of specificity, as do the MeSH Trees. These relationships are displayed graphically in the MeSH Browser and the online MeSH Tree Structures. The Trees data are also used by PubMed for the default behavior of inclusive searching. The Trees data in XML MeSH are to be found in the TreeNumber element.

4.3.3. Tree Structures in MeSH:

MeSH descriptors are organized in 16 categories:
category A for anatomic terms,
category B for organisms,
category C for diseases,
category D for drugs and chemicals, etc.

Each category is further divided into subcategories. Within each subcategory, descriptors are arrayed hierarchically from most general to most specific in up to thirteen hierarchical levels. These trees should not be regarded as representing an authoritative subject classification system but rather as arrangements of descriptors for the guidance and convenience of persons who are assigning subject headings to documents or are searching for literature. The trees are not an exhaustive classification of the subject matter but contain only those terms that have been selected for inclusion in this thesaurus. Their structure frequently represents a compromise among the views and needs of particular disciplines and users, in the absence of any single universally accepted arrangement.

Because of the branching structure of the hierarchies, these lists are sometimes referred to as “trees”. Each MeSH descriptor appears in at least one place in the trees, and may appear in as many additional places as may be appropriate. Those who index articles or catalog books are instructed to find and use the most specific MeSH descriptor that is available to represent each indexable concept. For example, articles concerning Streptococcus pneumoniae will be found under the descriptor Streptococcus Pneumoniae rather than the broader term Streptococcus, while an article referring to a new streptococcal bacterium which is not yet in the vocabulary will be listed directly under Streptococcus. Accordingly, the user may consult the trees to find additional subject headings which are more specific than a given heading, and broader headings as well.

For example, under Abnormalities, there are specific abnormalities:
Congenital Abnormalities C16.131
Abnormalities, Drug Induced C16.131.042
Abnormalities, Multiple C16.131.077

4.3.4. Concept Structure in MeSH:
Terms in a MeSH record which are strictly synonymous with each other are grouped in a category called a "Concept." (Not to be confused with Supplementary Concept Records.) See the Concept element in MeSH. Each MeSH record consists of one or more Concepts, and each Concept consists in one or more synonymous terms.

For example,

Cardiomegaly [Descriptor]
Cardiomegaly [Concept, Preferred]
Cardiomegaly [Term, Preferred]
Enlarged Heart [Term]
Heart Enlargement [Term]
Cardiac Hypertrophy [Concept, Narrower]
Cardiac Hypertrophy [Term, Preferred]
Heart Hypertrophy [Term]

This Descriptor record consists of two Concepts and five terms. Each Concept has a Preferred Term, which is also said to be the name of the Concept. And each record has a Preferred Concept. The name of the record - the term most often used to refer to the Descriptor - is the Preferred Term of the preferred Concept.

The MeSH Concept structure is not currently used in MEDLINE indexing or PubMed searching but is used by MeSH analysts in creating and updating the MeSH vocabulary and it supports relationships with other systems such as NLM’s Unified Medical Language System. The Concept structure is also used by The MeSH Translation Maintenance System* and has potential use for more advanced technology in information retrieval and other applications.

The Descriptor/Concept/Term structure makes it possible to attach various data elements in MeSH to the appropriate object. For example, thesauri have long distinguished between “broader terms” and “narrower” terms, but it is clear that these are relations between concepts and only derivatively between terms in the concepts. (See the ConceptRelation element.) Similarly, Scope Notes are properly attributed to Concepts, while the Annotation applies to the record level. The Concept structure also provides a precise way to specify strict synonymy since Concepts by definition consist of synonymous terms.

[NOTE -
Data Elements in MeSH records:
XML format
ASCII format: Descriptors, Qualifiers, SCR. 
Conversion table listing ASCII MeSH and ELHILL MeSH elements with the corresponding element in XML MeSH.
Relationships in Medical Subject Headings]

4.4. MeSH Browser:

Searching Vocabulary with the MeSH Browser,
The browser offers two search methods: FullWord Search and SubString Search.

a) **FullWord Search** looks for complete entry terms only, not strings that are part of a term, word, or sentence.

b) **SubString Search** will find records that have a string of characters as a complete term, or embedded in a term, word or sentence.

Each method can be further modified to search by Exact Match, All Fragments, or Any Fragment.

a) **Exact Match** finds terms that precisely match your search term regardless of whether the term has upper and lower case characters.

b) **All Fragments** finds terms that include all fragments of a search string in any particular order.

c) **Any Fragment** finds terms that include at least one fragment of a search string.

The look-up can also be restricted or limited with any of the following:

a) **Main Heading Terms** including Preferred Terms, Entry Terms, Entry Versions, and Permutated Terms found in Descriptor Records

b) **Qualifiers Terms** including Preferred Terms, Entry Terms, and Abbreviations found in Qualifier Records

c) **Supplementary Concept Record Terms** including Preferred Terms, Entry Terms, and N1 Terms found in Supplementary Concept Records

d) **All Terms** includes all of the above.

The search for records can also be targeted to any of these metadata fields,

a) **Pharmacological Action (PA)** finds all chemicals in MeSH that have a PA that matches the term you searched

b) **CAS Registry/EC Number/UNII Code** searches the RN and RR finds of all chemicals in MeSH. It will retrieve records with either a matching CAS Registry Number assigned by Chemical Abstracts Service, a matching Enzyme Commission (EC) number, or a FDA Substance Registry System Unique Identifier (UNII).

c) **MeSH Unique ID** finds Descriptor, Qualifier, and Supplemental Concept Records by their Record Unique Identifier

d) **Annotation or Scope Note** finds records with string matches in the text of these free-text fields

e) **Heading Mapped To (HM)** retrieves Supplemental Concept Records that are mapped to particular Descriptor Heading.

f) **Indexing Information (II)** retrieves Supplemental Concept Records that include a matching Descriptor Heading in their II field.

4.5. Use of MeSH:

(i) **Use of MeSH in Online Retrieval** - The MeSH vocabulary is designed for use by NLM for indexing and searching of the MEDLINE database of journal citations and other data. This enables retrieval systems, such as NLM's PubMed, to provide subject searching of the data. The following includes features of MeSH used for searching.

(ii) **Use of MeSH by Indexers** - The MeSH vocabulary is designed for use by NLM to index the MEDLINE database of journal citations and other media, and to search the
MEDLINE data using PubMed. The following outlines how MeSH is used by indexing of the MEDLINE journal articles.

(iii) Use of MeSH For Cataloging - The Cataloging and Metadata Management Section (CaMMS) at NLM uses Medical Subject Headings (MeSH) for assigning subject headings to materials in all formats. With few exceptions, catalogers apply the same basic principles as those used by indexers in assigning MeSH terms for the subject analysis of bibliographic materials (cf. Use of MeSH in Indexing). The information below outlines the exceptions between the use of MeSH as applied by catalogers versus indexers.

4.6. Advantages of Using MeSH:

(i) MeSH indexing facilitates the retrieval of relevant articles even when authors have used different words or spellings to describe the same topic.
(ii) MeSH indexing increases the discoverability of citations
(iii) MeSH indexing facilitates searching of both the broad and the narrow simultaneously due to the existence of the MeSH hierarchy

4.7. Disadvantages of Using MeSH

MeSH may not be useful if…

(i) The topic is a new or emerging concept for which a MeSH term does not yet exist.
(ii) The suspect that very little has been published on your topic - meaning, again, there is probably no MeSH term.
(iii) The topic is a gene, unless it is a very heavily studied gene such as BRCA1 (most genes do not have MeSH terms).
(iv) User want to retrieve recently published articles. The newest articles in PubMed may not yet be indexed for MEDLINE. There is a short lag time (a few days to many weeks) between when citations enter the PubMed database and when they are described with MeSH terms.
(v) An article user need is not indexed for MEDLINE. PubMed includes over 1.5 million articles that are not indexed with MeSH for MEDLINE.

In these circumstances, a basic keyword search would be the best way to retrieve articles.

5. Conclusion:

Subject headings in cataloguing records help people access information about themes addressed in library materials. Subject heading lists are used to characterise library materials consistently. Having a list of subject heading terms means the cataloger doesn’t need to think of a word to describe the item being catalogued—the relevant word or phrase is chosen from the list, and consistency is provided for all items on the same topic in the library. When categorising objects for a card catalogue, 1-3 subject headings were generally used to reduce the number of card sets and cards that needed to be transcribed and filed. With computer catalogues, catalogers can utilise any number and variety of headings that fit their collections and patrons’ demands. The cataloguer must be aware of all the options available in order to customise the cataloguing record to the preferences of the library users.
The three most common subject headings lists used in most libraries are SLSH, LCSH, and MeSH, the first two of which cover all subject areas while the third is only chosen for medical and associated science subjects. The goal of this project is to give readers a fundamental grasp of subject headings, information on how they function, and a list of the advantages and disadvantages of using each subject heading list. This knowledge will enable both a cataloguer and a regular librarian to choose the right subject headings for their library collections.

References:


Lazarinis, F. (2014). Subject access: LCSH, Children’s Subject Headings and Sears List of Subject Headings (Chapter 10). In Cataloguing and Classification An Introduction to AACR2, RDA, DDC, LCC, LCSH and MARC 21 Standards (pp. 193–209). Elsevier Ltd.


